Barnegat Township Board of Education
Energy Savings Plan

for
New Jersey Board of Public Utilities

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Draft Report
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Revision 0	June 16th, 2020
Revision 1	June 30th, 2020
Revision 2	August 3rd, 2020
Revision 3	August 17th, 2020

Table of Contents

REPORT DISCLAIMER

A walkthrough of four (4) of the schools was performed, which included gathering nameplate information and operating parameters for all accessible equipment and many of the lighting systems. Two (2) of the elementary schools were not visited by CHA due to restrictions resulting from the COVID-19 pandemic. Unless otherwise stated, model, efficiency, and capacity information included in this report were collected directly from equipment nameplates and /or from documentation provided by the owner during the site visit. Typical operation and scheduling information was obtained from interviewing school staff.

This Energy Savings Plan (ESP) was conducted in accordance with New Jersey Clean Energy Protocols to Measure Resource Savings. As such, an investment grade energy audit (IGA) was performed for the Owner-approved Energy Conservation Measures (ECMs) that were selected based on the original Local Government Energy Audit completed in October 2019 and recommendations provided by CHA following our audit. Cost and savings calculations for a given measure were estimated to within ±20% and are based on data obtained from the facility personnel, data obtained during site observations, professional experience, historical data, vendor quotes, and standard engineering practice. As the annual energy savings and estimated implementation costs are dependent on several dynamic factors, the accuracy of the energy savings and subsequent financial analysis is dependent on the measured, observed or provided baseline assumptions which include but may not be limited too; utility costs, utility rate changes, building usage, building temperatures, weather conditions, inflation, interest rate changes, etc. For these reasons, there is no guarantee expressed or implied for the actual annual energy savings resulting from the implementation of this ESP.

1.0 Executive Summary

This Energy Savings Plan (ESP) was prepared by CHA Consulting, Inc. (CHA) for the Barnegat Township School District (BTSD) in accordance with Energy Savings Improvement Program (ESIP) requirements, as specified in P.L. 2009, c.4 and P.L. 2012, Chapter 55. The ESP covers six (6) of BTSD's school buildings:

1. Cecil S. Collins Elementary School (Collins),
2. Barnegat Township High School (High School),
3. Robert L. Horbelt Elementary School (Horbelt),
4. Joseph T. Donahue Elementary School (Donahue),
5. Lillian M. Dunfee Elementary School (Dunfee), and
6. Russell O. Brackman Middle School (Brackman).

This report describes the proposed energy conservation measures and the associated energy savings that support how the ESP will pay for itself in reduced utility costs. The buildings/structures included in this ESP are as follows:

Table 1: Barnegat Township School District Buildings Summary

Name	Address	Description	Square Footage
Collins	570 Barnegat Blvd. N., Barnegat Twp., NJ 08005	Cecil S. Collins Elementary School was constructed in 1980 with major renovations in 2005. Includes Pre-K through 5.	86,000
High School	180 Bengal Blvd., Barnegat Twp., NJ 08005	The Barnegat Twp. High School was constructed in 2004, with a major addition of a new classroom wing and gymnasium completed in 2008. Includes Grades 9 through 12.	201,214
Horbelt	104 Bur St., Barnegat Twp., NJ 08005	Robert L. Horbelt Elementary School was constructed in 2001 with an addition of new classrooms added in 2009. Includes Grades K through 5.	80,856
Donahue	200 Bengal Blvd., Barnegat Twp., NJ 08005	The Joseph T. Donahue Elementary School was constructed in 2008 and is the newest of the Barnegat Twp. schools. Includes Grades K through 5.	72,402
Dunfee	128 Barnegat Blvd. N., Barnegat Twp., NJ 08005	The Lillian M. Dunfee Elementary School was constructed in 1974 with an addition of new classrooms and gymnasium added in 2009. Includes Grades K through 5.	70,817
Brackman	600 Barnegat Blvd. N., Barnegat Twp., NJ 08005	The Russell O. Brackman Middle School was constructed in 1989. Additions and alterations were made to the middle school in 2008, with the additions consisting of a classroom wing and a gymnasium. Includes Grades 6 through 8.	172,970
		Total	**684,259**

Under the law, the ESP must address the following:

1. The results of the energy audit;
2. A description of the energy conservation measures that will comprise the program;
3. An estimate of greenhouse gas reductions resulting from those energy savings;
4. Identification of all design and compliance issues and identification of who will provide these services;
5. An assessment of risks involved in the successful implementation of the plan;
6. Identify the eligibility for, and costs and revenues associated with the PJM Independent System Operator for demand response and curtailable service activities;
7. Schedules showing calculations of all costs of implementing the proposed energy conservation measures and the projected energy savings;
8. Maintenance requirements necessary to ensure continued energy savings, and describe how they will be provided; and
9. If developed by an Energy Services Company (ESCO), a description of, and cost estimates of a proposed energy savings guarantee (not applicable to this ESP).

The following tables summarize the recommended ECMs included in this ESP. Additional details of these ECMs are included in section 4.0 Energy Conservation Measures.

Table 2: District Wide ECMs Summary

ECM No.	ECM Name	Total Cost Savings* ($)	Implementation Cost ($)	Payback (years)
1.01	Convert all interior lighting to LED lighting	68,513	1,082,118	15.8
1.02	Install occupancy/daylight/dimming controls	3,140	44,333	14.1
1.03	Convert all exterior lighting to LED lighting and install controls	13,417	150,215	11.2
2.01	Replace Boilers, optimization controls	7,995	758,967	94.9
2.02	DHW Boiler Upgrade	1,273	38,114	49.3
2.03	DHW Tankless System Conversion	175	10,611	60.8
2.04	DHW Heater Electric to a Natural Gas Conversion	658	26,779	40.7
2.05	Install VFDs on Pumps	361	16,280	45.1
2.06	Install VFDs on AHU Fans	20,645	188,172	9.1
2.09	Upgrade Select WSHPs	2,784	183,131	65.8
2.10	Convert AHUs w/ Electric Heat to Hydronic Heat	3,862	33,293	8.6
2.13	Replace Mini-Split Units	109	14,368	131.3
2.14	Exhaust Fan Controls Upgrade	3,315	21,321	6.4
2.17	Replace Air Cooled Chiller	1,221	245,865	201.4
3.01	Controls Systems Upgrades	3,625	203,855	56.2
3.02	Install Walk-In Refrigerator/Freezer Controls	32,743	1,207,607	36.9
3.03	Install kitchen hood controls	5,142	50,484	9.8
3.04	Kitchen hood controls optimization	2,439	250,048	102.5
3.08	Add occupancy-based controls to the Vending Machines	1,355	8,954	6.6
4.01	Install Low Flow Aerators	3,123	10,102	3.2
	Totals	**180,517**	**4,558,131**	**25.3**

*Total Savings include energy and O&M savings.

Table 3: Collins ECMs Summary

ECM No.	ECM Name	Total Cost Savings* ($)	Implementation Cost ($)	Payback (years)
2.03	DHW Tankless System Conversion	175	10,611	60.8
3.01	Controls Systems Upgrades	9,837	205,003	20.8
3.02	Install Walk-In Refrigerator/Freezer Controls	738	8,172	11.1
3.03	Install kitchen hood controls	886	19,368	21.9
3.08	Add occupancy-based controls to the Vending Machines	306	1,172	3.8
4.01	Install Low Flow Aerators	794	1,259	1.6
	Totals	**12,736**	**245,586**	**19.3**

*Total Savings include energy and O&M savings.

Table 4: High School ECMs Summary

ECM No.	ECM Name	Total Cost Savings* ($)	Implementation Cost ($)	Payback (years)
1.01	Convert all interior lighting to LED lighting	24,734	423,681	17.1
1.03	Convert all exterior lighting to LED lighting and install controls	5,644	41,903	7.4
2.01	Replace Boilers, optimization controls	5,838	443,333	75.9
2.06	Install VFDs on AHU Fans	20,645	188,172	9.1
2.13	Replace Mini-Split Units	109	14,368	131.3
2.17	Replace Air Cooled Chiller	3,625	203,855	56.2
3.01	Controls Systems Upgrades	13,628	363,821	26.7
3.02	Install Walk-In Refrigerator/Freezer Controls	961	9,136	9.5
3.04	Kitchen hood controls optimization	1,355	8,954	6.6
3.08	Add occupancy-based controls to the Vending Machines	1,305	4,069	3.1
4.01	Install Low Flow Aerators	1,201	5,388	4.5
	Totals	**79,045**	**1,706,679**	**21.6**

*Total Savings include energy and O&M savings.

Table 5: Horbelt ECMs Summary

ECM No.	ECM Name	Total Cost Savings* ($)	Implementation Cost ($)	Payback (years)
1.01	Convert all interior lighting to LED lighting	10,840	205,678	19.0
1.02	Install occupancy/daylight/dimming controls	137	3,486	25.4
1.03	Convert all exterior lighting to LED lighting and install controls	1,343	23,240	17.3
2.04	DHW Heater Electric to a Natural Gas Conversion	334	13,880	41.5
2.09	Upgrade Select WSHPs	2,784	183,131	65.8
2.15	Replace Cooling Tower	1,221	245,865	201.4
3.01	Controls Systems Upgrades	336	178,945	533.2
3.02	Install Walk-In Refrigerator/Freezer Controls	578	8,172	14.1
3.03	Install kitchen hood controls	630	19,548	31.0
3.08	Add occupancy-based controls to the Vending Machines	242	1,172	4.8
4.01	Install Low Flow Aerators	405	2,483	6.1
	Totals	**18,851**	**885,601**	**47.0**

*Total Savings include energy and O&M savings.

Table 6: Donahue ECMs Summary

ECM No.	ECM Name	Total Cost Savings* ($)	Implementation Cost ($)	Payback (years)
1.01	Convert all interior lighting to LED lighting	12,515	157,630	12.6
1.02	Install occupancy/daylight/dimming controls	35	2,000	57.3
1.03	Convert all exterior lighting to LED lighting and install controls	2,527	44,852	17.7
2.02	DHW Boiler Upgrade	455	13,449	29.6
2.14	Exhaust Fan Controls Upgrade	1,401	8,970	6.4
3.02	Install Walk-In Refrigerator/Freezer Controls	1,184	9,141	7.7
3.03	Install kitchen hood controls	287	190,325	663.6
3.08	Add occupancy-based controls to the Vending Machines	340	828	2.4
4.01	Install Low Flow Aerators	714	2,113	3.0
	Totals	**19,458**	**429,307**	**22.1**

*Total Savings include energy and O&M savings.

Table 7: Dunfee ECMs Summary

ECM No.	ECM Name	Total Cost Savings* ($)	Implementation Cost ($)	Payback (years)
1.01	Convert all interior lighting to LED lighting	1,680	11,074	6.6
1.02	Install occupancy/daylight/dimming controls	1,634	22,522	13.8
1.03	Convert all exterior lighting to LED lighting and install controls	1,238	14,100	11.4
2.04	DHW Heater Electric to a Natural Gas Conversion	323	12,899	39.9
2.10	Convert AHUs w/ Electric Heat to Hydronic Heat	3,862	33,293	8.6
2.14	Exhaust Fan Controls Upgrade	1,914	12,351	6.5
3.01	Controls Systems Upgrades	1,098	147,066	133.9
3.02	Install Walk-In Refrigerator/Freezer Controls	1,180	8,172	6.9
3.03	Install kitchen hood controls	636	20,808	32.7
3.08	Add occupancy-based controls to the Vending Machines	171	414	2.4
4.01	Install Low Flow Aerators	502	1,320	2.6
	Totals	**14,238**	**284,018**	**19.9**

*Total Savings include energy and O&M savings.

Table 8: Brackman ECMs Summary

ECM No.	ECM Name	Total Cost Savings* ($)	Implementation Cost ($)	Payback (years)
1.01	Convert all interior lighting to LED lighting	18,744	284,055	15.2
1.02	Install occupancy/daylight/dimming controls	1,334	16,325	12.2
1.03	Convert all exterior lighting to LED lighting and install controls	2,665	26,120	9.8
2.01	Replace Boilers, optimization controls	2,157	315,634	146.3
2.02	DHW Boiler Upgrade	818	24,666	30.2
2.05	Install VFDs on Pumps	361	16,280	45.1
3.01	Controls Systems Upgrades	7,844	312,772	39.9
3.02	Install Walk-In Refrigerator/Freezer Controls	502	7,691	15.3
3.08	Add occupancy-based controls to the Vending Machines	759	2,448	3.2
4.01	Install Low Flow Aerators	1,006	951	0.9
	Totals	**36,189**	**1,006,940**	**27.8**

*Total Savings include energy and O&M savings.

2.0 Energy Audit Results

The first step to implementing an ESIP is the completion of an initial energy audit. This ESP includes, as reference, the Local Government Energy Audits (LGEAs) previously approved by the NJBPU on October 31st, 2019. The audits are included in Appendix A.

In addition to the previously conducted audits mentioned above, CHA completed an IGA as part of the development of this ESP. The IGA verified baseline building and equipment operating parameters, including specific equipment operation, seasonal operation data, etc. In addition, the following documents were collected and reviewed by CHA:

1. Facility Assessment Report completed by Spiezle Architectural Group Inc. (Spiezle) on August 27th, 2019, including an equipment inventory.
2. 13-months of Utility Bills (February 2019 through February 2020)
3. Existing Brookfield Renewable Power Purchase Agreement (PPA) and Construction Drawings
4. GreenTech Energy Services Lighting Proposal dated September 25, 2019.
5. Energy NJ LLC Solar PV Array Proposal dated May 11, 2020
6. Jersey State Controls Proposal Scope and Pricing
7. Original and renovation construction drawings (HVAC, electrical, structural, etc.) provided by Spiezle on March 23, 2020
8. Barnegat Township School District maintenance account history dated May 12,2020
9. The Thermo Group Infrared Roof Moisture Survey dated October 2018
10. The Thermo Group Roof Repair Procedures dated October 15, 2018

3.0 Baseline Energy Analysis

3.1 Utilities

An energy and cost analysis of BTSD's utilities – electricity, natural gas, photovoltaic, and water/sewer – was completed to account for more recent utility rates and usage since the original LGEAs were prepared. Electricity is delivered by Jersey Central Power & Light (JCP&L) and supplied by Plymouth Rock Energy. Natural gas is delivered by New Jersey Natural Gas (NJNG) and supplied by UGI Energy Services LLC. Water and Sewer are provided by Barnegat Township. The energy analysis covered a 12-month period; March 2019 through February 2020.

CHA weather normalized the natural gas usage with 30-year historical weather data. This accounts for the difference in weather in a given year, which may be much hotter or colder than an average year for Barnegat, NJ. Normalizing also makes sure the energy savings calculations accurately represent expected long-term annual energy savings. The detailed utility analysis which includes normalization is included in Appendix B.

For the 12-month period ending in February 2020, the utility usage for the buildings was as follows:

Table 8: BTSD Utility Summary

	Collins	High School	Horbelt	Donahue	Dunfee	Brackman
Electric						
Annual Usage (kWh)	368,235	2,214,480	693,299	581,852	370,944	1,336,622
Peak Demand (kW)	136.6	701.3	214.0	201.3	192.8	431.1
Min. Demand (kW)	96.1	397.4	131.9	132.5	123.8	307.6
Avg. Demand (kW)	121.0	516.5	179.7	159.8	160.5	373.8
Annual Cost ($)	52,708	252,824	80,035	67,975	47,724	156,762
Blended Rate ($/kWh)	0.143	0.114	0.115	0.117	0.129	0.117
Supply Rate ($/kWh)	0.120	0.097	0.097	0.097	0.098	0.097
Demand Rate ($/kW)	5.83	6.21	6.00	5.90	5.95	6.18
Natural Gas						
Annual Usage (therms)	23,667	40,643	12,637	12,963	16,994	16,296
Annual Cost ($)	24,937	43,924	14,175	14,566	17,628	17,487
Rate ($/therm)	1.05	1.08	1.12	1.12	1.04	1.07
Water/Sewer						
Annual Usage (kGal)	590	2,786	334	556	421	610
Annual Cost ($)	17,202	42,206	9,658	12,348	9,866	19,178
Water Rate ($/kGal)	6.66	5.93	5.84	6.04	5.13	6.88

The following table displays the total annual energy usage, in million-Btu per year (MMBtu/yr), and the EUI, in kilo-Btu per year (kBtu/yr), for each school

Table 9: BTSD Energy Summary

	Collins	High School	Horbelt	Donahue	Dunfee	Brackman
Total Energy Use (MMBtu/yr)	5,132	13,503	3,860	4,207	3,930	7,613
EUI (kBtu/SF/yr)	59.7	67.1	47.7	58.1	55.5	44.0

3.2 Solar PV Generation

Solar photovoltaic (PV) arrays were installed on each school in 2012 as part of a single power purchasing agreement (PPA) between BTSD and Brookfield Renewable (Brookfield). The current PPA ends in 2027. A review of JCP&L interval data revealed there is no net export from the BTSD facilities. Therefore, 100% of the solar generation is used by the BTSD facilities. Solar PV generation provides approximately 24% of the total electric power used by the 6 schools, as summarized below:

Table 9: BTSD Solar PV Generation

	Collins	High School	Horbelt	Donahue	Dunfee	Brackman
Photovoltaic						
Annual Generation (kWh)	350,556	454,417	45,812	239,023	224,121	462,149
Percent of Total Usage (%)	49%	17%	6%	29%	38%	26%
Annual Cost ($)	44,135	57,211	5,768	30,093	28,217	58,185
PPA Rate ($/kWh)*	0.1259	0.1259	0.1259	0.1259	0.1259	0.1259

* The current PPA includes an escalation rate of 2% per year. Currently, the PPA rate is greater than the utility blended rate for 4 of the 6 schools.

4.0 Energy Conservation Measures

Energy conservation measures included in this ESP are energy savings improvements that require a financial investment. The table below lists all ECMs assessed during the development of this ESP. Base bid ESP ECMs are marked with an “X” and alternate ECMs are marked with and “A”. Financially unattractive ECMs were left unmarked.

Table 10: Energy Conservation Measures

ECM No.	Energy Conservation Measure	Collins	High School	Horbelt	Donahue	Dunfee	Brackman
1.01	Convert all interior lighting to LED lighting		X	X	X	X	X
1.02	Install occupancy/daylight/dimming controls			X	X	X	X
1.03	Convert all exterior lighting to LED lighting and install controls		X	X	X	X	X
2.01	Replace Boilers, optimization controls		X				A
2.02	DHW Boiler Upgrade				X		X
2.03	DHW Tankless System Conversion	X					
2.04	DHW Heater Electric to a Natural Gas Conversion			X		X	
2.05	Install VFDs on Pumps						X
2.06	Install VFDs on AHU Fans		X				
2.07	Replace Select RTUs						
2.08	Replace Select ERUs						
2.09	Upgrade Select WSHPs			X			A
2.10	Convert AHUs w/ Electric Heat to Hydronic Heat					X	
2.11	Replace Unit Ventilators						
2.12	Replace Fan Coil Units						
2.13	Replace Mini-Split Units		X				
2.14	Exhaust Fan Controls Upgrade				X	X	
2.15	Replace Cooling Tower			A			
2.16	Replace Walk-In Refrigerator/Freezer Condensers/Evaporators						
2.17	Replace Air Cooled Chiller		X				
3.01	Controls Systems Upgrades	X	X	X		X	X
3.02	Install Walk-In Refrigerator/Freezer Controls	X	X	X	X	X	X
3.03	Install kitchen hood controls	X		X	X	X	
3.04	Kitchen hood controls optimization		X				
3.05	Scheduling Optimization						
3.06	Setpoint Optimization						
3.07	Setback Programming (Terminal Units)						
3.08	Add occupancy-based controls to the Vending Machines	X	X	X	X	X	X
4.01	Install Low Flow Aerators	X	X	X	X	X	X
4.02	Touchless Facuets						
4.03	Install Flushless Urinals						
4.04	Install Low Flow Toilets						

In developing the ESP, the above measures were evaluated for inclusion based on the following factors:

- Energy use reduction
- Implementation cost
- Financial payback and annual cash flow
- Value to the school district

CHA prepared IGA-level calculations on selected ECMs to develop the ESP. Field surveys of the buildings and equipment were performed by CHA to verify the data that was included in the LGEA, as necessary to support preparation of an ESP and associated IGA. The survey was coordinated with building personnel, and equipment records were reviewed to obtain more detailed information.

Baseline building and equipment operating parameters were verified and refined, including occupied and unoccupied temperatures, ventilation, normal occupancy, special conditions occupancy, and seasonal operation data. See Appendix C for detailed IGA-level energy calculations, including estimated Greenhouse Gas (GHG) reductions.

Each measure is described in greater detail in the following sections.

4.1 Lighting Measures

1.01 Convert All Interior Lighting to LED

This measure involves the replacement/upgrade of current interior lighting fixtures and lamps to more efficient LED fixtures and lamps. Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to estimated hours of operation. These calculations are based upon one-to-one replacements. For linear fluorescent fixtures, the school has requested that the new LED lamps have internal drivers that allow them to connect to line voltage. The existing ballasts can therefore be removed. This follows the same strategy the school has taken for Collins and Dunfee, and for some fixtures in the four schools listed below. Although the ballast bypass option adds labor cost, the school would like to maintain consistency with the retrofits that have already been done.

The calculations assume that existing lighting levels should be maintained, resulting in the recommended one-for-one replacements.

Building	Description
High School	Approximately 60% of the High School's interior lighting fixtures use T8 linear fluorescent lamps, with the majority being 4ft F25T8 lamps. The remaining 40% of fixtures are broken down as follows: 20% LED lamps/fixtures, 15% CLFs, 5% other fluorescent lamps. There is an opportunity to reduce the High School's annual lighting system electrical consumption by converting all non-LED fixtures and lamps to LED. BTSD has stated that they would like all linear fluorescent lamp conversions to be self-driven ballast bypass LED lamps. All other lighting conversions will be a combination of plug-and-play (PNP) lamps and new LED fixtures.
Horbelt	Approximately 83% of Horbelt's interior lighting fixtures use T8 linear fluorescent lamps, with the majority being 4ft F25T8 lamps. The remaining 17% is comprised of fixtures using CFLs and a variety of other fluorescent lamps. There is an opportunity to reduce Horbelt's annual lighting system electrical consumption by converting all non-LED fixtures and lamps to LED. BTSD has stated that they would like all linear fluorescent lamp conversions to be self-driven ballast bypass LED lamps. All other lighting conversions will be a combination of PNP lamps and new LED fixtures.
Donahue	Approximately 84% of Donahue's interior lighting fixtures use T8 linear fluorescent lamps, with the majority being 4ft F25T8 lamps. The remaining 16% is comprised of fixtures using a variety of other fluorescent lamps, CFLs, and LED lamps/fixtures. There is an opportunity to reduce Donahue's annual lighting system electrical consumption by converting all non-LED fixtures and lamps to LED. BTSD has stated that they would like all linear fluorescent lamp conversions to be self-driven ballast bypass LED lamps. All other lighting conversions will be a combination of PNP lamps and new LED fixtures.
Brackman	Approximately 92% of Brackman's interior lighting fixtures use T8 linear fluorescent lamps, with the majority being 4ft

Building	Description
	F25T8 lamps. The remaining 8% is comprised of LED lamps/fixtures, and fixtures using CFLs and other fluorescent lamps. There is an opportunity to reduce Brackman's annual lighting system electrical consumption by converting all non-LED fixtures and lamps to LED. BTSD has stated that they would like all linear fluorescent lamp conversions to be self-driven ballast bypass LED lamps. All other lighting conversions will be a combination of PNP lamps and new LED fixtures.
Dunfee	Approximately 85% of Dunfee's interior lighting fixtures use T8 linear LED lamps, with the majority being 4ft LED lamps. The remaining 15% is comprised of fixtures using a variety of other CFLs and T5 linear fluorescent lamps. There is an opportunity to reduce Dunfee's annual lighting system electrical consumption by converting all non-LED fixtures and lamps to LED. BTSD has stated that they would like all linear fluorescent lamp conversions to be self-driven ballast bypass LED lamps. All other lighting conversions will be a combination of PNP lamps and new LED fixtures.

1.02 Install Occupancy/Daylight/Dimming Controls

This measure involves the installation of controls on the lighting fixtures proposed in ECM 1.02. The installation of controls will allow for lighting systems to be automatically shut off when spaces are unoccupied. Energy savings for this measure were calculated by applying a reduction in lighting hours to the ECM 1.02 proposed fixture wattages.

Building	Description
Horbelt	Approximately 44% of Horbelt's interior lighting fixtures are controlled via local switches. There is an opportunity to reduce Horbelt's annual lighting system electrical consumption by installing lighting controls to reduce the lighting systems' annual runtimes.
Donahue	Approximately 19% of Donahue's interior lighting fixtures are controlled via local switches. There is an opportunity to reduce Donahue's annual lighting system electrical consumption by installing lighting controls to reduce the lighting systems' annual runtimes.
Brackman	Approximately 100% of Brackman's interior lighting fixtures are controlled via local switches. There is an opportunity to reduce Brackman's annual lighting system electrical consumption by installing lighting controls to reduce the lighting systems' annual runtimes.
Dunfee	Approximately 20% of Dunfee's interior lighting fixtures are controlled via local switches. There is an opportunity to reduce Dunfee's annual lighting system electrical consumption by installing lighting controls to reduce the lighting systems' annual runtimes.

1.03 Convert All Exterior Lighting to LED Lighting and Install Controls

This measure involves the replacement/upgrade of current exterior lighting fixtures and lamps to more efficient LED fixtures and lamps. Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to estimated times of operation. These calculations are based upon one-for-one replacements. The calculations do not consider lumen output and square footage. A more comprehensive lighting study may be required during the design phase to determine appropriate lighting levels.

Building	Description
High School	Approximately 72% of the High School's exterior lighting fixtures use HID lamps, with the majority being 200-watt induction lamps. The remaining 28% is comprised of fixtures using CFLs. All the High School's exterior lighting fixtures are operated through a control system. There is an opportunity to reduce the High School's annual lighting system electrical consumption by converting all non-LED fixtures to LED.
Horbelt	Approximately 81% of Horbelt's exterior lighting fixtures use HID lamps, with the majority being 100-watt metal halide lamps. The remaining 19% is comprised of fixtures using CFLs. All Horbelt's exterior lighting fixtures are operated through a control system. There is an opportunity to reduce Horbelt's annual lighting system electrical consumption by converting all non-LED fixtures to LED.
Donahue	Approximately 61% of Donahue's exterior lighting fixtures use HID lamps, with the majority being 70-watt induction lamps. The remaining 39% is comprised of fixtures using CFLs and incandescent lamps. All of Donahue's exterior lighting fixtures are operated through a control system. There is an opportunity to reduce Donahue's annual lighting system electrical consumption by converting all non-LED fixtures to LED.
Brackman	Approximately 94% of Brackman's exterior lighting fixtures use HID lamps, with the majority being 200-watt induction lamps. The remaining 6% is comprised of fixtures using CFLs. Only 6% of Brackman's exterior lighting fixtures are not operated through a control system There is an opportunity to reduce Brackman's annual lighting system electrical consumption by converting all non-LED fixtures to LED and installing lighting controls.
Dunfee	Approximately 100% of Dunfee's exterior lighting fixtures use CFLs lamps, with the majority being 75-watt lamps. All of Dunfee's exterior lighting fixtures are operated through a control system. There is an opportunity to reduce Dunfee's annual lighting system electrical consumption by converting all non-LED fixtures to LED.

Lighting Measures Summary

The following table summarizes the recommended Lighting measures at a district level.

District Wide Lighting Measures Summary												
Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
1.01	Convert all interior lighting to LED lighting	255.2	512,506	0	68,513	0	129,108	68,513	1,082,118	15.8	13.9	
1.02	Install occupancy/daylight/dimming controls	0.0	25,588	0	3,140	0	16,226	3,140	44,333	14.1	8.9	
1.03	Convert all exterior lighting to LED lighting and install controls	24.4	116,581	0	13,417	0	68,342	13,417	150,215	11.2	6.1	
	Total (recommended measures)	**279.6**	**654,675**	**0**	**85,071**	**0**	**213,676**	**85,071**	**1,276,666**	**15.0**	**12.5**	

4.2 HVAC Systems Measures

2.01 Replace Boilers, Optimize Controls

The Barnegat Township School District currently has a combination of older low efficiency heating hot water (HHW) boilers and new high efficiency condensing HHW boilers. This ECM proposes to replace the older low efficiency HHW boilers with new high efficiency natural gas-fired condensing HHW boilers. Condensing boilers achieve higher combustion efficiencies by using the heat ordinarily wasted in the flue gases to pre-heat the return water entering the boiler. The lower flue vent temperatures result in condensation which is chemically neutralized and drained to the sanitary system.

Building	Description
High School	The High School houses two boiler plants, one installed in 2004 and the other installed in 2009. The 2004 boiler plant feeds the A/B Wing and houses 4 boiler groups installed in a 2N redundancy configuration. Each of the four boiler groups are comprised of eight boilers rated at 399 MBH output, each, with calculated efficiencies averaging between 75% and 77%. The efficiencies were calculated using nameplate data, age, and NJBPU-approved* methodology for derating boiler efficiency based on age. The 2004 boiler plant's total capacity is 12,768 MBH. This ECM proposes to replace two of the four boiler strings in the 2004 boiler plant with two 2,000 MBH high efficiency, condensing, modulating natural gas boilers. The ECM also recommends that the new boilers be designated as the lead boilers and the remaining two boiler strings be designated backup boilers only. This ECM would implement an HHW reset schedule based on outdoor air temperatures (OATs). If the backup boilers run, care would need to be taken to keep water temperatures elevated and to deviate from the reset schedule. The boilers installed under this ECM would have efficiencies averaging between 90% and 93%. The thermal efficiency improvement of the proposed boilers would result in natural gas savings. The 2009 boiler plant feeds the C Wing and houses two 2,000 MBH Benchmark condensing boilers. These boilers are not recommended for replacement.
Brackman (Alternate ECM-1 Included in Cash Flow)	Brackman houses one boiler plant with two boilers installed in 2006. The boilers are standard efficiency natural gas fired boilers each with a rated output of 1,020 MBH and a calculated efficiency of 79.2%. The efficiencies were calculated using nameplate data, age, and NJBPU-approved* methodology for derating boiler efficiency based on age. This ECM proposes to replace the two existing boilers with two 1,200 MBH (input) high efficiency, condensing, natural gas fired boilers. The boilers installed under this ECM would have efficiencies averaging between 90% and 93%. The thermal efficiency improvement of the proposed boilers would result in natural gas savings.

**See Pay for Performance Program Existing Buildings Partner Guidelines Version 4.4 FY20 (P4P EB Guidelines FY20) section 4.6.4.7 Derating HVAC Equipment Efficiency.*

2.02 DHW Heater Upgrade

The Barnegat Township School District currently has a combination of older, low efficiency, natural gas domestic hot water (DHW) heaters; new, high efficiency, condensing natural gas DHW heaters; and electric DHW heaters. This ECM proposes to replace the older low efficiency DHW heaters with new high efficiency natural gas fired condensing DHW heaters. Condensing units achieve higher combustion efficiencies by using the heat ordinarily wasted in the flue gases to pre-heat the return water entering the boiler. The lower flue vent temperatures result in condensation which is chemically neutralized and drained to the sanitary system.

Building	Description
Donahue	Domestic hot water at Donahue is generated by a PVI natural gas fired heater with an input rating of 199 MBH, an estimated efficiency of 78%, and a storage tank capacity of 175 gallons. This unit was installed in 2008. The heater efficiency was calculated using nameplate data, age, and the P4P EB Guidelines FY20 section 4.6.4.7 Derating HVAC Equipment Efficiency. The proposed heater installed under this ECM would have a rated input of 199 MBH, an average efficiency of 95%, and a storage capacity of 250 gallons. The thermal efficiency improvement of the proposed unit would result in natural gas savings.
Brackman	Domestic hot water at Brackman is generated by two A.O. Smith natural gas fired water heaters each with an input rating of 420 MBH, a calculated efficiency of 74%, and a shared storage tank with capacity of 200 gallons. The efficiencies were calculated using nameplate data, age, and the P4P EB Guidelines FY20 section 4.6.4.7 Derating HVAC Equipment Efficiency. These units were installed in 1989 and are well past the end of their useful life. The proposed heater installed under this ECM would have a rated input of 500 MBH and an average efficiency of 95%. The thermal efficiency improvement of the proposed boilers would result in natural gas savings.

2.03 DHW Tankless System Conversion

The Barnegat Township School District currently has a combination of older, low efficiency, natural gas DHW boilers; new, high efficiency, condensing natural gas DHW boilers; and electric DHW boilers. Most of these units have storage tanks. This ECM proposes to remove select DHW heaters with storage tanks and replace them with new, high efficiency, natural gas fired, instantaneous, condensing DHW heaters. Condensing DHW heaters achieve higher combustion efficiencies by using the heat ordinarily wasted in the flue gases to pre-heat the return water entering the boiler. The lower flue vent temperatures result in condensation which is chemically neutralized and drained to the sanitary system. Tankless DHW systems eliminate standing losses incurred through DHW storage tanks.

Building	Description
Collins	Domestic hot water at Collins is generated by a Vanguard natural gas fired heater with an input rating of 75 MBH, an estimated efficiency of 75.7%, and a storage tank capacity of 75 gallons. The unit's efficiency was calculated using nameplate data, age, and the P4P EB Guidelines FY20 section 4.6.4.7 Derating HVAC Equipment Efficiency. This DHW heater was installed in 2008. The proposed heater installed under this ECM would have an average efficiency of 95%. The thermal efficiency improvement of the proposed heater as well as the removal of the DHW storage tank would result in natural gas savings.

2.04 DHW Heater Electric to a Natural Gas Conversion

The Barnegat Township School District currently has a combination of older, low efficiency, natural gas DHW heaters; new, high efficiency, condensing natural gas DHW heaters; and electric DHW heaters. This ECM proposes to replace the electric DHW heaters with new high efficiency natural gas-fired condensing DHW heaters. Natural gas is less expensive per unit energy, when compared to electricity.

Building	Description
Horbelt	Domestic hot water for the music wing at Horbelt is generated by an A.O. Smite electric heater. This ECM recommends the electric DHW heater be removed and a high efficiency, natural gas fired, tankless DHW heater be installed. The DHW heater installed under this ECM would have an average efficiency 92%. The conversion from electricity to natural gas will result in utility cost savings.
Dunfee	Domestic hot water for the kitchen at Dunfee is generated by a Bradford-White electric heater with a storage tank capacity of 80 gallons. This heater was installed in 2008. The heater installed under this ECM would be a high efficiency, natural gas fired, condensing tankless DHW heater with a rated input of 199 MBH, a max flow rate of 10 GPM, an average efficiency of 93%. The conversion from electricity to natural gas will result in utility cost savings.

2.05 Install VFDs on Pumps

The Barnegat Township School District utilizes pumps for the transportation of HHW, DHW, Chilled Water (CHW), and Condenser Water (CW). Most of the pumps in the BTSD buildings are equipped with variable frequency drives (VFDs). However, there are some pumps that are still controlled by conventional motor starters. In contrast to constant speed controls and multi-speed controls, VFDs allow for the variable control of motor speeds. VFDs also enable a constant differential pressure to be maintained in the distribution piping of a system. This level of control allows for a system to operate efficiently and effectively during part load conditions. Due to the Affinity Laws, VFDs also yield energy savings when motor speeds are reduced. This ECM reduces energy consumption and improves overall system efficiency through the installation of VDFs on constant speed and multi-speed motors.

Building	Description
Brackman	The HHWPs at Brackman are equipped with high efficiency, 5-HP motors and constant speed controls. The motors have been installed in a 2N redundancy configuration and are operated in a lead-lag fashion. The control valves on the HHW loop are 2-way type valves. This ECM recommends the installation of VFDs on these motors, along with a differential sensor in the distribution system. The pumps will operate to maintain an adjustable differential pressure. Please note that it is assumed that the existing motors will need to be replaced with inverter-duty rated, premium efficiency motors.

2.06 Refurbish Select AHUs (Fan VFD Conversion)

The Barnegat Township School District buildings utilize variety of HVAC equipment types to condition and ventilate spaces, one of which is air handling units (AHUs) equipped with CHW coils for cooling and either HHW coils, natural gas-fired furnaces, or electric resistance coils for heating. AHUs can be classified into two system types: Constant Air Volume (CAV) and Variable Air Volume (VAV). Airflow in a VAV system is changed by varying fan motor speed with VFDs and adjusting VAV air box damper positions. Due to the Affinity Laws, the fan motor VFDs yield energy savings when motor speeds are reduced. This ECM recommends converting CAV AHU systems to VAV AHU systems through the installation of VFDs on constant speed motors. This will reduce energy consumption and improve overall system efficiency.

Building	Description
High School	The High School has 18 AHUs and they are comprised of both CAV systems and VAV systems. This ECM proposes to convert existing constant volume AHUs AH-1, AH-4, AH-5, AH-10, and AH-15 to single zone VAV units. The AHUs affected by the scope of this ECM are all equipped with CHW coils for cooling and HW coils for heating. The fan speeds would be controlled by space temperatures and return air CO_2 levels. The new VAV systems will save energy on the fan motors due to reduced motor speeds and the Affinity Laws.

2.09 Upgrade Select Water Source Heat Pumps

The Barnegat Township School District buildings utilize a variety of HVAC equipment types to condition and ventilate spaces, one of which is water source heat pumps. This ECM recommends replacing select WSHPs with new, high efficiency units. This ECM would reduce the annual utility cost for conditioning spaces currently served by the older, inefficient WSHPs.

Building	Description
Horbelt	Horbelt is conditioned by 61 WSHPs of varying ages, makes, models, capacities, and efficiencies. This ECM recommends replacing seven of the 61 WSHPs with new, high efficiency units. The targeted units serve the gymnasium, the stage, and some classrooms with calculated heating efficiencies ranging from 2.58 to 4.37 COP and cooling efficiencies ranging from 9.03 to 10.49 EER. The efficiencies were calculated using nameplate data, age, and NJBPU-approved* methodology for derating DX HVAC equipment efficiency based on age. The proposed replacement units have heating efficiencies ranging from 4.60 to 4.64 COP and cooling efficiencies ranging from 13.26 to 14.31 EER. The new WSHPs will save energy though the improved heating and cooling efficiencies.
Brackman (Alternate ECM-3 Excluded from Cash Flow)	Brackman conditions and provides ventilation to the building's corridors through the use of eight AHUs. The CHW and HW coils in these AHUs are each fed by an individual water-to-water WSHPs. The existing WSHPs are Addison WWR360004A units, each with a cooling capacity of 3-tons. These units have not been in operation for approximately 10 years. The proposed units have a cooling capacity of 33.8 MBH with a cooling efficiency of 16.6 EER and a heating capacity of 38.4 MBH with a heating efficiency of 3.5 COP. This measure is a non-energy savings measure and will increase the energy consumption at Brackman. Since the units have not been used in nearly a decade, CHW and HW coil integrity will need to be checked during the design phase.

**See Pay for Performance Program Existing Buildings Partner Guidelines Version 4.4 FY20 (P4P EB Guidelines FY20) section 4.6.4.7 Derating HVAC Equipment Efficiency.*

2.10 Convert AHUs w/ Electric Heat to Heating Hot Water

The Barnegat Township School District buildings utilize a variety of HVAC equipment types to condition and ventilate spaces, one of which is AHUs equipped with electric resistance coils for heating. This ECM recommends eliminating use of the electric resistance coil and instead installing and using a heating hot water coil.

Although electric heat is highly efficient, electricity costs more per unit energy than natural gas. This ECM would reduce the annual utility cost for conditioning spaces currently served by AHUs equipped with electric resistance coils.

Building	Description
Dunfee	Dunfee's cafeteria is conditioned by an RTU equipped with a 150 kW electric resistance heating coil heating. This ECM would keep the electric resistance coil in the unit, but disconnect it from service unless needed in an emergency. A heating hot water coil would be installed downstream of the unit in the ductwork of the mechanical room. The boilers are located in the room, so hot water piping is very close nearby. Piping would be extended to the coil located in the discharge ductwork. During the design phase, care will be needed to ensure flow is available from the existing pumps and that an additional booster pump is not needed.

2.13 Replace Mini-Split Units

The Barnegat Township School District buildings utilize a variety of HVAC equipment types to condition and ventilate spaces, one of which is mini-split systems. This ECM recommends replacing select mini-splits with new, high efficiency units. This ECM would reduce the annual utility cost for conditioning spaces currently served by the older, inefficient mini-splits.

Building	Description
High School	The High School uses two mini-split units as supplemental cooling equipment. The units were installed in 2003 and serve separate rooms. One unit has a rated cooling capacity of 0.75 tons and the 3.0 tons. The calculated efficiencies for the 0.75-ton unit and the 3.0-ton unit are 1.3 kW/ton and 1.4 kW/ton, respectively. The efficiencies were calculated using nameplate data, age, and NJBPU-approved* methodology for derating DX HVAC equipment efficiency based on age. This ECM recommends replacing the mini-split units with new high efficiency units. The 0.75-ton and 3.0-ton proposed replacement units both have an efficiency of 0.8 kW/ton. The new mini-split units will save energy though the improved cooling efficiencies.

**See Pay for Performance Program Existing Buildings Partner Guidelines Version 4.4 FY20 (P4P EB Guidelines FY20) section 4.6.4.7 Derating HVAC Equipment Efficiency.*

2.14 Exhaust Fan Controls Upgrade

The Barnegat Township School District buildings utilize a variety of HVAC equipment types to condition and ventilate spaces, one of which is exhaust fans (EFs). Some of the exhaust fans are equipped with constant speed permanent split capacitor (PSC) motors that operate 24/7 year-round. This ECM recommends replacing these EFs with new higher efficiency EFs equipped with direct drive electrically commutated (EC) motors and adding operating schedules to reduce runtimes. This ECM would reduce the annual electric utility cost for operating the EFs.

Building	Description
Dunfee	Dunfee's building exhaust is provided by nine roof mounted, belt driven EFs equipped with fractional horsepower PSC motors, which are rated at an average efficiency of 60%. The units serve restrooms, the kitchen, and general exhaust in the building. They operate 24 hours a day, 365 days of the year. This measure evaluates the savings associated with replacing the nine existing EFs with new higher efficiency EFs that are equipped with direct drive EC motors, which are rated at an average efficiency of 90%. This measure also evaluated adding an operating schedule to reduce EF runtimes.
Donahue	Donahue's building exhaust is provided by eight roof mounted, belt driven EFs equipped with fractional horsepower PSC motors, which are rated at an average efficiency of 60%. The units serve restrooms, the kitchen, and general exhaust in the building. They operate 24 hours a day, 365 days of the year. This measure evaluates the savings associated with replacing the eight existing EFs with new higher efficiency EFs that are equipped with direct drive EC motors, which are rated at an average efficiency of 90%. This measure also evaluated adding an operating schedule to reduce EF runtimes.

2.15 Replace Cooling Tower

The Barnegat Township School District buildings utilize a variety of equipment to reject heat during the cooling season, one of which is cooling towers. This ECM recommends replacing select cooling towers with new, high efficiency units. This ECM would reduce the annual utility cost for rejecting heat from conditioned spaces.

Building	Description
Horbelt **(Alternate ECM-2** Included in Cash Flow**)**	Horbelt is conditioned by 61 WSHPs that are served by a single heat pump loop (HPL). The HPL receives heat from the boiler plant during the heating season and rejects heat through a closed circuit, centrifugal fan cooling tower during the cooling season. The existing cooling tower was installed in 2001 and has a maximum condenser water flowrate of 549 GPM and is equipped with two 30 HP fans on VFDs. The calculated efficiency of the existing cooling tower is 9.15 GPM/HP. This ECM recommends replacing the existing tower with a VFD equipped, high efficiency, closed circuit, axial fan cooling tower with a calculated efficiency of 21.96 GPM/HP. The new cooling tower will save energy though more efficient heat rejection.

2.17 Replace Air Cooled Chiller

The Barnegat Township School District buildings utilize a variety of HVAC equipment types to condition spaces, one of which is air cooled chillers. This ECM recommends replacing an existing air-cooled chiller at the High School with a new, high efficiency units. This ECM would reduce the annual utility cost for conditioning spaces during the cooling season.

Building	Description
High School	The High School's chilled water is generated using a 150-ton air-cooled chiller that was installed in 2007. In 2019 the chiller had two if its six compressors fail and require replacement, along with a new control board. The chiller's calculated efficiency is 1.35 kW/ton. The efficiencies were calculated using nameplate data, age, and NJBPU-approved* methodology for derating DX HVAC equipment efficiency based on age. This ECM recommends replacing the air-cooled chiller with a new, high efficiency unit. The proposed chiller would be a 150-ton air-cooled chiller with a full load efficiency of 1.20

Building	Description
	kW/Ton. The new chiller will save energy through more efficient compressors and controls.

HVAC Systems Measures Summary

The following table summarizes the HVAC System measures at a district level.

District Wide HVAC Systems Measures Summary													
Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
2.01	Replace Boilers, optimization controls	0.0	0	7,421	7,995	0	23,749	7,995	758,967	94.9	92.0	
2.02	DHW Boiler Upgrade	0.0	0	702	773	500	2,246	1,273	38,114	49.3	28.2	
2.03	DHW Tankless System Conversion	0.0	0	166	175	0	530	175	10,611	60.8	57.8	
2.04	DHW Heater Electric to a Natural Gas Conversion	0.9	8,232	-193	658	0	2,634	658	26,779	40.7	36.7	
2.05	Install VFDs on Pumps	1.0	2,959	0	361	0	947	361	16,280	45.1	42.4	
2.06	Install VFDs on AHU Fans	32.9	170,595	1,520	20,645	0	59,454	20,645	188,172	9.1	6.2	
2.09	Upgrade Select WSHPs	19.8	13,989	0	2,784	0	4,476	2,784	183,131	65.8	64.2	
2.10	Convert AHUs w/ Electric Heat to Hydronic Heat	0.0	45,748	-1,951	3,862	0	14,639	3,862	33,293	8.6	4.8	
2.13	Replace Mini-Split Units	0.0	960	0	109	0	307	109	14,368	131.3	128.5	
2.14	Exhaust Fan Controls Upgrade	0.0	26,851	0	3,315	0	8,592	3,315	21,321	6.4	3.8	
2.15	Replace Cooling Tower	11.1	4,348	0	1,221	0	1,391	1,221	245,865	201.4	200.2	
Total (recommended measures)		**65.8**	**273,681**	**7,665**	**41,897**	**500**	**118,966**	**42,397**	**1,536,901**	**36.3**	**33.4**	

4.3 Controls Measures

3.01 Control Systems Upgrades

Includes Demand Control Ventilation, Occupancy Sensor Control, and Scheduling Optimization

Demand control ventilation (DCV) allows for OA ventilation to be reduced beyond conventional rates through the monitoring of CO_2. This ECM recommends DCV be implemented on select units. It also recommends installing occupancy sensors in the space to close the OA damper, reduce fan speed (if applicable), and go into setback mode if occupancy is not sensed.

The reduction in OA ventilation and fan energy would reduce the required energy required to meet space conditioning requirements.

Please note that with the exception of Donahue, this ECM carries the cost of upgrading the control system in each building. For Donahue, this cost is included in ECM-3.03. Where possible, scheduling optimization through the improved control system was also included in these savings.

Building	Description
Collins	This ECM recommends controlling the OA damper position on certain AHUs based on room CO_2 levels. It will also shut the units off completely if the spaces are unoccupied, as determine through occupancy sensors. If shutting off the units is too aggressive, just the OA damper would be shut during unoccupied times. This ECM only looks at units serving large, open spaces that function as a single zone. Therefore, the units serving classrooms and the main office are not included.
High School	This ECM proposes the installation of CO_2 sensors in the new gymnasium spaces that are served by units Gym RTU-1 and Gym RTU-2 to allow for reduced outdoor air flows based on indoor CO_2 levels when conditions allow. This will result in both heating and cooling savings for the school as the existing units are constant volume units. This ECM interacts with the boiler replacements and the proposed boiler efficiency has been considered in the savings calculations.
Horbelt	This ECM proposes the installation of CO_2 sensors in the gymnasium, cafeteria, media center, music room, and stage spaces to allow for OA ventilation rates to be reduced when indoor CO_2 levels allow it. This will result in both heating and cooling savings for the school as the existing units are constant volume units. This ECM interacts with the boiler replacements and the proposed boiler efficiency has been considered in the savings calculations.
Dunfee	This ECM proposes the installation of CO_2 sensors in the gymnasium to allow for OA ventilation rates to be reduced when indoor CO_2 levels allow it. There are (2) packaged rooftop units with DX cooling and gas heating, with heat recovery wheels that currently serve the gym. This will result in both heating and cooling savings for the school as the existing units are constant volume units.
Brackman	This ECM proposes the installation of CO_2 sensors in the auxiliary gymnasium spaces to allow for OA ventilation rates to be reduced when indoor CO_2 levels allow it. This will result in both heating and cooling savings for the school as the existing units are constant volume units. This ECM interacts with the boiler replacements and the proposed boiler efficiency has been considered in the savings calculations.

3.02 Install Walk-In Refrigerator/Freezer Controls

Walk-in refrigerators and freezers are commonplace in facilities where large amounts of perishables need to be stored. Each building in the BTSD has at least one walk-in refrigerator and one walk-in freezer. Walk-in refrigerator and walk-in freezer compressor controls and evaporator fan controls will reduce equipment run times while still ensuring refrigerator and freezer temperatures are maintained. This ECM recommends the installation of controls on the walk-in refrigerator and walk-in freezer compressors and evaporator fans. The reduced equipment run times would decrease the energy consumed by the walk-in refrigerators and walk-in freezers.

Building	Description
Collins	Collins contains one walk-in cooler and one walk in freezer. The existing evaporator fans are equipped with standard pole shaded motors that run 24/7 with no means of control. This measure evaluates the savings associated with replacing the existing evaporator fan motors with high efficiency EC motors as well as installing controls. The EC motors will save energy and the controls will reduce evaporator fan runtime. The controls will also reduce compressor and condenser runtimes by an estimated 5%. These savings are calculated using NJBPU protocols.
High School	The High School contains one walk-in cooler and one walk in freezer. The existing evaporator fans are equipped with standard pole shaded motors that run 24/7 with no means of control. This measure evaluates the savings associated with replacing the existing evaporator fan motors with high efficiency EC motors as well as installing controls. The EC motors will save energy and the controls will reduce evaporator fan runtime. The controls will also reduce compressor and condenser runtimes by an estimated 5%. These savings are calculated using NJBPU protocols.
Horbelt	Horbelt contains one walk-in cooler and one walk in freezer. The existing evaporator fans are equipped with standard pole shaded motors that run 24/7 with no means of control. This measure evaluates the savings associated with replacing the existing evaporator fan motors with high efficiency EC motors as well as installing controls. The EC motors will save energy and the controls will reduce evaporator fan runtime. The controls will also reduce compressor and condenser runtimes by an estimated 5%. These savings are calculated using NJBPU protocols.
Donahue	Donahue contains one walk-in cooler and one walk in freezer. The existing evaporator fans are equipped with standard pole shaded motors that run 24/7 with no means of control. This measure evaluates the savings associated with replacing the existing evaporator fan motors with high efficiency EC motors as well as installing controls. The EC motors will save energy and the controls will reduce evaporator fan runtime. The controls will also reduce compressor and condenser runtimes by an estimated 5%. These savings are calculated using NJBPU protocols.
Dunfee	Dunfee contains one walk-in cooler and one walk in freezer. The existing evaporator fans are equipped with standard pole shaded motors that run 24/7 with no means of control. This measure evaluates the savings associated with replacing the existing evaporator fan motors with high efficiency EC motors as well as installing controls. The EC motors will save energy and the controls will reduce evaporator fan runtime. The controls will also reduce compressor and condenser runtimes by an estimated 5%. These savings are calculated using NJBPU protocols.
Brackman	Brackman contains one walk-in cooler and one walk in freezer. The existing evaporator fans are equipped with standard pole shaded motors that run 24/7 with no means of control. This measure evaluates the savings associated with replacing the existing evaporator fan motors with high efficiency EC motors as well as installing controls. The EC motors will save energy and the controls will reduce evaporator fan runtime. The

	controls will also reduce compressor and condenser runtimes by an estimated 5%. These savings are calculated using NJBPU protocols.

3.03 Install Kitchen Hood Controls

Kitchen hood EFs without controls are manually operated via local switches and are typically left on during kitchen hours. Kitchen hood EF controls monitor the exhaust air combustibles and stovetop usage to control the kitchen hood EF speeds and run times. This ECM recommends that controls be installed on the kitchen hood EFs. The reduced runtimes resultant of the controls would decrease the energy consumed by the kitchen hood EFs.

Building	Description
Collins	Collins' kitchen hood EF is powered by a 0.75 HP fan, 2,000 CFM fan that is manually operated and runs from 7AM to 3PM when the kitchen is occupied. This ECM recommends that controls be installed on the kitchen hood EF. Makeup air is provided by a nearby outside air/return air AHU that provides ventilation to the cafeteria and kitchen. The OA damper on the AHU would adjust its position based on the EF operation. The reduced ventilation and reduced fan energy will result in energy savings.
Horbelt	Horbelt's kitchen hood EF is powered by a 0.25 HP, 1,140 CFM fan that is manually operated and runs from 7AM to 3PM when the kitchen is occupied. This ECM recommends that controls be installed on the kitchen hood EF. Makeup air is provided by a heat pump serving the kitchen area that takes in outside air. The OA damper on the heat pump would adjust its position based on the EF operation. The reduced ventilation and reduced fan energy will result in energy savings.
Donahue	Donahue's kitchen hood EF is powered by a 0.75 HP, 2,000 CFM fan that is manually operated and runs from 7AM to 3PM when the kitchen is occupied. This ECM recommends that controls be installed on the kitchen hood EF. Makeup air is provided by a heat pump serving that takes in outside air. The OA damper on the heat pump would adjust its position based on the EF operation. The reduced ventilation and reduced fan energy will result in energy savings. The cost for this upgrade also includes the cost of upgrading the building management system.
Dunfee	Dunfee's kitchen hood EF is powered by a 1.0 HP, 3,656 CFM fan that is manually operated and runs from 7AM to 3PM when the kitchen is occupied. This ECM recommends that controls be installed on the kitchen hood EF. Makeup air is provided by a nearby outside air/return air AHU that provides ventilation to several spaces including the kitchen. The OA damper on the AHU would adjust its position based on the EF operation. The reduced ventilation and reduced fan energy will result in energy savings.

3.04 Kitchen Hood Controls Optimization

Kitchen hood EFs with controls that are manually overridden are operated inefficiently and unnecessarily increase fan and ventilation energy. This ECM recommends that the manual override placed on the kitchen hood EF controls be turned off and the controls reset to automatic operation.

Building	Description
High School	The High School has a 5 HP exhaust fan on the kitchen hood and a dedicated makeup air unit with a 3 HP fan motor. Both fans are currently controlled by a Melink system but have been manually overridden to operate at 100% when on. This ECM proposes to implement a control sequence on the existing Melink controls so that both the 5 HP exhaust fan and 3 HP makeup fan run at variable speeds based on heat and smoke levels. Resetting the controls to automatic operation will reduce runtimes and, in turn, would decrease the energy consumed by the kitchen hood EFs.

3.08 Add Occupancy-Based Controls to the Vending Machines

Vending machines are seldomly turned off, especially refrigerated beverage and refrigerated snack vending machines. Occupancy-based controls allow for vending machines to turn off lighting and reduce refrigerator runtimes when the area around the units is vacant. The reduction in lighting and refrigerator runtimes would reduce the energy consumed by the vending machines.

Building	Description
Collins	Per the LGEA, Collins has 1 refrigerated beverage vending machine and 2 non-refrigerated snack vending machines. This ECM recommends the installation of vending machine controls. Controls would reduce the energy consumed by the vending machines.
High School	The high school has 5 refrigerated beverage vending machines, 3 refrigerated glass-front coolers, and 2 non-refrigerated snack vending machines. This ECM recommends the installation of vending machine controls. Controls would reduce the energy consumed by the vending machines.
Horbelt	Horbelt has 1 refrigerated beverage vending machine and 2 non-refrigerated snack vending machines. This ECM recommends the installation of vending machine controls. Controls would reduce the energy consumed by the vending machines.
Donahue	Donahue has 2 refrigerated beverage vending machines. This ECM recommends the installation of vending machine controls. Controls would reduce the energy consumed by the vending machines.
Dunfee	Per the LGEA, Dunfee has 1 refrigerated beverage, and two non-refrigerated snack vending machines. This ECM recommends the installation of vending machine controls. Controls would reduce the energy consumed by the vending machines.
Brackman	Brackman has 2 refrigerated beverage vending machines, 3 refrigerated glass-front coolers, and 1 non-refrigerated snack vending machine. This ECM recommends the installation of vending machine controls. Controls would reduce the energy consumed by the vending machines.

Controls Measures Summary

The following table summarizes the Controls measures at a district level. Please note that the controls upgrade cost is included in ECM-3.01 for all schools except Donahue. For Donahue, the controls upgrade cost is included in ECM-3.03.

District Wide Controls Measures Summary												
Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
3.01	Controls Systems Upgrades	6.5	221,366	5,969	32,743	0	89,937	32,743	1,207,607	36.9	34.1	
3.02	Install Walk-In Refrigerator/Freezer Controls	2.7	49,219	0	5,142	0	15,750	5,142	50,484	9.8	6.8	
3.03	Install kitchen hood controls	3.0	15,392	487	2,439	0	6,485	2,439	250,048	102.5	99.9	
3.04	Kitchen hood controls optimization	0.0	4,417	789	1,355	0	3,937	1,355	8,954	6.6	3.7	
3.08	Add occupancy-based controls to the Vending Machines	3.3	28,993	0	3,123	0	5,051	3,123	10,102	3.2	1.6	
Total (recommended measures)		**15.4**	**319,388**	**7,245**	**44,802**	**0**	**121,161**	**44,802**	**1,527,197**	**34.1**	**31.4**	

4.4 Water Measures

4.01 Install Low Flow Aerators

Most faucets installed in the last 5 to 10 years are rated between 1.5 GPM and 2.0 GPM. Low flow aerators can reduce faucet flowrates to as low as 0.5 GPM without replacing the entire faucet. This ECM recommends the installation of low flow aerators on existing faucets. The aerators would decrease the domestic water consumption. Please note that sewer costs are fixed for the schools and would not decrease with the reduction in water usage.

Building	Description
Collins	Collins has 22 faucets in the building. The flowrate of the existing faucets is, on average, 1.5 GPM. This ECM recommends the installation of low flow aerators to reduce the faucets' flowrate to 0.5 GPM. The aerators would decrease the domestic water consumption.
High School	The High School has 102 faucets and lab/slop sinks in the building. The flowrate of the existing faucets is, on average, 1.5 GPM. This ECM recommends the installation of low flow aerators to reduce the faucets' flowrate to 0.5 GPM. The aerators would decrease the domestic water consumption.
Horbelt	Horbelt has 47 faucets in the building. The flowrate of the existing faucets is, on average, 1.5 GPM. This ECM recommends the installation of low flow aerators to reduce the faucets' flowrate to 0.5 GPM. The aerators would decrease the domestic water consumption.
Donahue	Donahue has 40 faucets in the building. The flowrate of the existing faucets is, on average, 1.9 GPM. This ECM recommends the installation of low flow aerators to reduce the faucets' flowrate to 0.5 GPM. The aerators would decrease the domestic water consumption.
Dunfee	Brackman has 25 faucets in the building. The flowrate of the existing faucets is, on average, 2.0 GPM. This ECM recommends the installation of low flow aerators to reduce the faucets' flowrate to 0.5 GPM. The aerators would decrease the domestic water consumption.
Brackman	Brackman has 102 faucets in the building. The flowrate of the existing faucets is, on average, 1.5 GPM. This ECM recommends the installation of low flow aerators to reduce the faucets' flowrate to 0.5 GPM. The aerators would decrease the domestic water consumption.

Water Measures Summary

The following table summarizes the Water measures at a district level.

District Wide Water Measures Summary												
Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
4.01	Install Low Flow Aerators	0.0	0	0	4,623	0	0	4,623	13,512	2.9	2.9	
Total (recommended measures)		**0.0**	**0**	**0**	**4,623**	**0**	**0**	**4,623**	**13,512**	**2.9**	**2.9**	

4.5 Building Management Systems Upgrades

The Barnegat Township School District's existing digital direct control (DDC) systems are outdated and, in some cases, have limited capabilities. This ESP recommends that new, updated controls be installed at BTSD to ensure that all HVAC system measures, and controls measures can be successfully implemented and operated effectively and efficiently. These costs are carried in ECM-3.01 for all schools except Donahue. For Donahue, these costs are carried in ECM-3.03.

4.6 Combined Heat & Power

Please note that in order to be eligible for a 20 year project term, combined heat and power (CHP) needs to be included in this project. We have recommended that a 35 kW unit be included in the boiler room of the High School. It should run as a thermal-following unit, so that when there is either sufficient heating hot water load or domestic hot water load, it is operating. During the summer, its runtime will be minimal. The 35 kW unit consumes 407 MBH of natural gas while operating, and puts out approximately 204 MBH of waste heat that can be utilized towards building thermal loads.

The annual cost savings are projected to be about $5,071. With an expected $1,562 annual O&M expenditure, the net savings are about $3,509. The total capital cost is expected to be $333,593.

5.0 Renewable Energy

Barnegat Township School District has existing renewable energy facilities (renewables) in the form of rooftop mounted PV panels. The PV panels were installed in 2012 and produce electricity that Barnegat purchases under an ongoing PPA. The PV panels are owned and operated by TerraForm Power (TERP), which was acquired by Brookfield in 2017 and who now holds the PPA. The current PPA has a 15-year term and is set to expire in 2027. The table below summarizes BTSD's existing PV electric capacity, electricity generation, the PPA electricity rates ($/kWh) for each school.

Table 11: BTSD Existing PV Summary

	Collins	High School	Horbelt	Donahue	Dunfee	Brackman
Electric Utility Consumption Rate ($/kWh)	0.1201	0.0967	0.0967	0.0974	0.0978	0.0965
PP Rate ($/kWh)	0.1259	0.1259	0.1259	0.1259	0.1259	0.1259
DC Capacity (kW)	280.80	368.16	40.56	177.84	184.08	365.04
Annual Generation (kWh)	350,556	454,417	45,812	239,023	224,121	462,149
% of Annual Electricity Consumption*	49%	17%	6%	29%	38%	26%
Annual Cost ($)	44,135	57,211	5,768	30,093	28,217	58,185
% of Annual Electricity Cost**	46%	18%	7%	31%	37%	27%

*Annual consumption is comprised of electricity generated by the PV panels and delivered by the electric utility company.
**Annual cost is comprised of the PPA cost and BTSD's electric utility cost.

The PV electricity rate stipulated under the existing PPA between BTSD and Brookfield, $0.1259 per kWh generated, is greater than the electricity consumption rates at all six schools. At the aforementioned rate, BTSD is paying more for electricity generated by the existing PV than for electricity purchased from the grid.

CHA has evaluated multiple options that would improve BTSD's PV economics. The best available option, proposed by EZNergy, is to install carport mounted PV panels under a new PPA with an electricity rate of $0.0450 per kWh generated. The additional PV capacity would increase the amount of onsite PV electricity generation and reduce the amount of electricity purchased from the grid. The combination of the additional PV with the lower PPA rate will result in an average electricity PV rate that is lower than the electric utility consumption rate.

The table below summarizes BTSD's PV systems if the aforementioned PV system and PPA are implemented in conjunction with the ECMs proposed in section 4.0. Please note that some of the generation values recommended by EZNergy were lowered to avoid producing more electric than any of the schools would consume.

Table 12: BTSD Proposed PV Summary

		Collins	High School	Horbelt	Donahue	Dunfee	Brackman
Existing	DC Capacity (kW)	280.80	368.16	40.56	177.84	184.08	365.04
	Annual Generation (kWh)	350,556	454,417	45,812	239,023	224,121	462,149
Additional	DC Capacity (kW)	242.40	1,392.00	254.40	261.60	204.80	472.00
	Annual Generation (kWh)	216,765	1,162,266	322,070	302,187	174,539	601,190
Proposed Total	DC Capacity (kW)	523.20	1,760.16	294.96	439.44	388.88	837.04
	Annual Generation (kWh)	567,321	1,616,682	367,882	541,210	398,661	1,063,339
	% of Annual Electric Consumption*	86%	76%	60%	81%	84%	69%
	Annual PV Cost ($)	53,787	109,380	20,248	43,691	36,071	85,238
	% of Annual Electric Cost**	73%	55%	37%	65%	64%	54%

*Annual consumption is comprised of electricity generated by the PV panels and delivered by the electric utility company.
**Annual cost is comprised of the PPA cost and BTSD's electric utility cost.

6.0 Financial Analysis

6.1 Overview

While the LGEA included preliminary installation costs, this ESP provides more refined savings and cost estimates based on preliminary design concepts. IGA-level implementation cost estimates were prepared in consultation with various vendors and through prior experience.

The following financial analysis includes a review of All ECMs that have been included as part of the BTSD ESP.

The following items are part of this financial overview.

- Demand Response – Overview of demand response and curtailable services form the PJM Independent System Operator. Please note that BTSD already participates and no additional demand response activity is recommended.

- Operation & Maintenance – Overview of O&M savings associated with recommended ECMs

- Incentives – Overview of New Jersey Smart Start Program incentives associated with recommended ECMs

- Simple Payback – Overview of costs, savings and payback associated with recommended ECMs. Measures are evaluated individually and by school and include O&M savings and incentives.

- Financial Cash Flow – A 20-year cash flow analysis, including costs, savings and financing for recommended ECMs identified in this ESP.

See Appendix D for additional Financial Analysis details.

6.2 Demand Response

Demand Response is a consumer's ability to reduce electricity consumption at their location when wholesale prices are high, or the reliability of the electric grid is threatened. PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia. Acting as a neutral, independent party, PJM operates a competitive wholesale electricity market and manages the high-voltage electricity grid to ensure reliability for more than 51 million people. In PJM's Energy Market, end-use customers participate in demand response by reducing their electricity use either during an emergency event or when locational marginal prices (LMPs) are high on the PJM system. End-use customers participate in demand response in PJM through members called curtailment service providers (CSPs), who act as agents for the customers.

The Barnegat Township School District currently participates in demand response programs. Therefore, no further demand response activities are recommended. PJM costs and revenues have not been included as part of this ESP.

6.3 Operation and Maintenance

Operation and Maintenance (O&M) and other energy-related cost savings that result in reductions in expenses (other than energy cost savings) related to energy and water consuming equipment, are allowable under ESIP.

Energy-related cost savings can result from avoided expenditures for operations, maintenance, equipment repair, or equipment replacement due to the project. This includes capital funds for projects (e.g., equipment replacement) that, because of the project, will not be necessary. Sources of energy-related savings include:

- avoided current or planned capital expense
- transfer of responsibility for O&M and/or R&R to the contractor, and
- avoided renovation, renewal, or repair costs as a result of replacing old and unreliable equipment.

Methods for estimating O&M savings resulting from changes to equipment have not been developed under the ESP Implementation Guidelines, however as a rule, any savings claimed from O&M activities must result in a real decrease in expenditures.

Operation and maintenance savings have not been included as part of this ESP. The exclusion of O&M savings is due to lack of detailed documentation to identify and justify accurate O&M savings resultant of the recommended ECMs. An O&M loss has been included to account for the additional O&M requirements of the proposed CHP system.

6.4 Incentives

Some of the ECMs recommend in this ESP are eligible for NJBPU's SmartStart Incentive Program. This program provides incentives for pre-approved mechanical and electrical equipment replacements, as well as pre-approved custom measures. The program covers a wide variety of ECMs, including chillers, boilers, VFDs, unitary HVAC equipment, and lighting retrofits/upgrades. Each incentive must be applied for and approved by the NJBPU (or corresponding utility program) prior to the installation of the equipment. Incentive payments are made to the owner after the equipment is fully installed and paid for. CHA estimated incentives for the recommended ECMs using application forms from the NJCEP website. The lighting upgrades and lighting controls incentives were estimated using the prescriptive lighting application form and the lighting controls application form. All other ECM incentives were estimated using the custom application form. Since the BTSD buildings are "K-12" facilities, BTSD is eligible for Enhanced Incentives under the SmartStart Incentive Program. CHA will be applying for SmartStart incentives for all eligible ECMs on behalf of BTSD. Please note that the incentives included in this report are estimates and not guaranteed. Incentives cannot be locked in until the SmartStart applications have been approved by the SmartStart program manager.

CHA assessed the NJBPU's Pay for Performance (P4P) program and does not recommend BTSD pursue participation. The P4P program incentives are dispersed in three payments over time, with only two of the three payments being guaranteed. The third payment is performance based, with a cap, and is only paid out after a 12-month M&V has been completed. The performance requirement presents the risk of BTSD receiving only a portion of the third payment if saving goals are not met with no opportunity to increase the third payment if savings goals are exceeded. In addition to payments being dispersed over time, P4P requires that all participating facilities must have a peak electric demand of 200 kW or greater within the last 12 months. This qualifier eliminates the participation of Collins and Dunfee given the last 12 months of utility data. Horbelt and Donahue are also at risk of ineligibility if their electric demand drops by less than 10% within the next 12 months. Overall, despite the fact that P4P has higher incentives than the other NJBPU programs, it has a high risk of a reduced incentive if performance targets aren't met. For these reasons, CHA does not recommend BTSD pursue participation in the P4P program.

6.5 Simple Payback Analysis

The tables below provide summaries of the calculated savings, implementation costs, operation & maintenance savings, incentives, and payback for each measure. The additional proposed PV for each building has also been included.

District Wide Summary													
Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Water Savings (kGal)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
1.01	Convert all interior lighting to LED lighting	255.2	512,506	0	0	68,513	0	129,108	68,513	1,082,118	15.8	13.9	
1.02	Install occupancy/daylight/dimming controls	0.0	25,588	0	0	3,140	0	16,226	3,140	44,333	14.1	8.9	
1.03	Convert all exterior lighting to LED lighting and install control	24.4	116,581	0	0	13,417	0	68,342	13,417	150,215	11.2	6.1	
2.01	Replace Boilers, optimization controls	0.0	0	7,421	0	7,995	0	23,749	7,995	758,967	94.9	92.0	
2.02	DHW Boiler Upgrade	0.0	0	702	0	773	500	2,246	1,273	38,114	49.3	28.2	
2.03	DHW Tankless System Conversion	0.0	0	166	0	175	0	530	175	10,611	60.8	57.8	
2.04	DHW Heater Electric to a Natural Gas Conversion	0.9	8,232	-193	0	658	0	2,634	658	26,779	40.7	36.7	
2.05	Install VFDs on Pumps	1.0	2,959	0	0	361	0	947	361	16,280	45.1	42.4	
2.06	Install VFDs on AHU Fans	32.9	170,595	1,520	0	20,645	0	59,454	20,645	188,172	9.1	6.2	
2.09	Upgrade Select WSHPs	19.8	13,989	0	0	2,784	0	4,476	2,784	183,131	65.8	64.2	
2.10	Convert AHUs w/ Electric Heat to Hydronic Heat	0.0	45,748	-1,951	0	3,862	0	14,639	3,862	33,293	8.6	4.8	
2.13	Replace Mini-Split Units	0.0	960	0	0	109	0	307	109	14,368	131.3	128.5	
2.14	Exhaust Fan Controls Upgrade	0.0	26,851	0	0	3,315	0	8,592	3,315	21,321	6.4	3.8	
2.15	Replace Cooling Tower	11.1	4,348	0	0	1,221	0	1,391	1,221	245,865	201.4	200.2	
2.17	Replace Air Cooled Chiller	18.9	22,841	0	0	3,625	0	7,309	3,625	203,855	56.2	54.2	
3.01	Controls Systems Upgrades	6.5	221,366	5,969	0	32,743	0	89,937	32,743	1,207,607	36.9	34.1	
3.02	Install Walk-In Refrigerator/Freezer Controls	2.7	49,219	0	0	5,142	0	15,750	5,142	50,484	9.8	6.8	
3.03	Install kitchen hood controls	3.0	15,392	487	0	2,439	0	6,485	2,439	250,048	102.5	99.9	
3.04	Kitchen hood controls optimization	0.0	4,417	789	0	1,355	0	3,937	1,355	8,954	6.6	3.7	
3.08	Add occupancy-based controls to the Vending Machines	3.3	28,993	0	0	3,123	0	5,051	3,123	10,102	3.2	1.6	
4.01	Install Low Flow Aerators	0.0	0	0	754	4,623	0	0	4,623	13,512	2.9	2.9	
	Total (recommended measures)	**379.6**	**1,270,584**	**14,910**	**754**	**180,017**	**500**	**461,112**	**180,517**	**4,558,131**	**25.3**	**22.7**	

	Peak kW (kW)	kWh Generated (kWh)	Therm Generated (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
PV Totals	1,649.9	4,555,096	0	149,034	0	0	149,034				

	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
Building Total After PV	**379.6**	**1,270,584.4**	**14,910**	**149,788**	**180,017**	**500**	**610,146**	**180,517**	**0.3**	**0.3**	

Cecil S. Collins Elementary School and Board Offices													
Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Water Savings (kGal)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
2.03	DHW Tankless System Conversion	0.0	0	166	0	175	0	530	175	10,611	60.8	57.8	
3.01	Controls Systems Upgrades	4.9	43,625	3,830	0	9,837	0	26,217	9,837	205,003	20.8	18.2	
3.02	Install Walk-In Refrigerator/Freezer Controls	0.3	5,729	0	0	738	0	1,833	738	8,172	11.1	8.6	
3.03	Install kitchen hood controls	0.3	6,919	0	0	886	0	2,214	886	19,368	21.9	19.4	
3.08	Add occupancy-based controls to the Vending Machines	0.3	2,297	0	0	306	0	586	306	1,172	3.8	1.9	
4.01	Install Low Flow Aerators	0.0	0	0	119	794	0	0	794	1,259	1.6	1.6	
	Total (recommended measures)	**5.7**	**58,570**	**3,996**	**119**	**12,736**	**0**	**31,381**	**12,736**	**245,586**	**19.3**	**16.8**	

	Peak kW (kW)	kWh Generated (kWh)	Therm Generated (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
PV Totals	216.2	567,321	0	16,274	0	0	16,274				

	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
Building Total After PV	**5.7**	**58,570.2**	**3,996**	**29,010**	**0**	**31,381**	**29,010**	**245,586**	**8.5**	**7.4**	

Barnegat Township High School

Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Water Savings (kGal)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
1.01	Convert all interior lighting to LED lighting	105.1	174,088	0	0	24,734	0	45,456	24,734	423,681	17.1	15.3	
1.03	Convert all exterior lighting to LED lighting and install contro	11.3	49,489	0	0	5,644	0	28,142	5,644	41,903	7.4	2.4	
2.01	Replace Boilers, optimization controls	0.0	0	5,405	0	5,838	0	17,297	5,838	443,333	75.9	73.0	
2.06	Install VFDs on AHU Fans	32.9	170,595	1,520	0	20,645	0	59,454	20,645	188,172	9.1	6.2	
2.13	Replace Mini-Split Units	0.0	960	0	0	109	0	307	109	14,368	131.3	128.5	
2.17	Replace Air Cooled Chiller	18.9	22,841	0	0	3,625	0	7,309	3,625	203,855	56.2	54.2	
3.01	Controls Systems Upgrades	0.0	109,872	1,021	0	13,628	0	38,426	13,628	363,821	26.7	23.9	
3.02	Install Walk-In Refrigerator/Freezer Controls	0.6	9,476	0	0	961	0	3,032	961	9,136	9.5	6.4	
3.04	Kitchen hood controls optimization	0.0	4,417	789	0	1,355	0	3,937	1,355	8,954	6.6	3.7	
3.08	Add occupancy-based controls to the Vending Machines	1.4	12,371	0	0	1,305	0	2,034	1,305	4,069	3.1	1.6	
4.01	Install Low Flow Aerators	0.0	0	0	203	1,201	0	0	1,201	5,388	4.5	4.5	
	Total (recommended measures)	**170.2**	**554,109**	**8,735**	**203**	**79,045**	**0**	**205,395**	**79,045**	**1,706,679**	**21.6**	**19.0**	

	Peak kW (kW)	kWh Generated (kWh)	Therm Generated (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
PV Totals	523.9	1,616,682	0	60,061	0	0	60,061				

	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
Building Total After PV	**170.2**	**554,109.0**	**8,735**	**139,106**	**0**	**205,395**	**139,106**	**1,706,679**	**12.3**	**10.8**	

Robert L. Horbelt Elementary School

Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Water Savings (kGal)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
1.01	Convert all interior lighting to LED lighting	40.3	81,757	0	0	10,840	0	25,342	10,840	205,678	19.0	16.6	
1.02	Install occupancy/daylight/dimming controls	0.0	1,183	0	0	137	0	3,486	137	3,486	25.4	0.0	
1.03	Convert all exterior lighting to LED lighting and install contro	2.7	11,830	0	0	1,343	0	6,000	1,343	23,240	17.3	12.8	
2.04	DHW Heater Electric to a Natural Gas Conversion	0.5	4,671	-141	0	334	0	1,495	334	13,880	41.5	37.0	
2.09	Upgrade Select WSHPs	19.8	13,989	0	0	2,784	0	4,476	2,784	183,131	65.8	64.2	
2.15	Replace Cooling Tower	11.1	4,348	0	0	1,221	0	1,391	1,221	245,865	201.4	200.2	
3.01	Controls Systems Upgrades	1.6	2,290	0	0	336	0	733	336	178,945	533.2	531.0	
3.02	Install Walk-In Refrigerator/Freezer Controls	0.3	5,729	0	0	578	0	1,833	578	8,172	14.1	11.0	
3.03	Install kitchen hood controls	1.9	5,088	0	0	630	0	1,628	630	19,548	31.0	28.4	
3.08	Add occupancy-based controls to the Vending Machines	0.3	2,297	0	0	242	0	586	242	1,172	4.8	2.4	
4.01	Install Low Flow Aerators	0.0	0	0	69	405	0	0	405	2,483	6.1	6.1	
	Total (recommended measures)	**78.5**	**133,183**	**-141**	**69**	**18,851**	**0**	**46,971**	**18,851**	**885,601**	**47.0**	**44.5**	

	Peak kW (kW)	kWh Generated (kWh)	Therm Generated (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
PV Totals	110.8	367,882	0	16,664	0	0	16,664				

	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
Building Total After PV	**78.5**	**133,183.0**	**-141**	**35,515**	**0**	**46,971**	**35,515**	**885,601**	**24.9**	**23.6**	

Joseph T. Donahue Elementary School

Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Water Savings (kGal)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
1.01	Convert all interior lighting to LED lighting	41.5	98,334	0	0	12,515	0	20,698	12,515	157,630	12.6	10.9	
1.02	Install occupancy/daylight/dimming controls	0.0	298	0	0	35	0	250	35	2,000	57.3	50.1	
1.03	Convert all exterior lighting to LED lighting and install contro	5.1	22,250	0	0	2,527	0	15,600	2,527	44,852	17.7	11.6	
2.02	DHW Boiler Upgrade	0.0	0	405	0	455	0	1,296	455	13,449	29.6	26.7	
2.14	Exhaust Fan Controls Upgrade	0.0	11,974	0	0	1,401	0	3,832	1,401	8,970	6.4	3.7	
3.02	Install Walk-In Refrigerator/Freezer Controls	0.6	11,706	0	0	1,184	0	3,746	1,184	9,141	7.7	4.6	
3.03	Install kitchen hood controls	0.8	2,369	0	0	287	0	758	287	190,325	663.6	661.0	
3.08	Add occupancy-based controls to the Vending Machines	0.4	3,224	0	0	340	0	414	340	828	2.4	1.2	
4.01	Install Low Flow Aerators	0.0	0	0	118	714	0	0	714	2,113	3.0	3.0	
	Total (recommended measures)	**48.3**	**150,156**	**405**	**118**	**19,458**	**0**	**46,593**	**19,458**	**429,307**	**22.1**	**19.7**	

	Peak kW (kW)	kWh Generated (kWh)	Therm Generated (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
PV Totals	181.9	541,210	0	15,833	0	0	15,833				

	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
Building Total After PV	**48.3**	**150,155.6**	**405**	**35,291**	**0**	**46,593**	**35,291**	**429,307**	**12.2**	**10.8**	

Lillian M. Dunfee Elementary School

Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Water Savings (kGal)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
1.01	Convert all interior lighting to LED lighting	4.4	13,998	0	0	1,680	0	1,564	1,680	11,074	6.6	5.7	
1.02	Install occupancy/daylight/dimming controls	0.0	12,704	0	0	1,634	0	440	1,634	22,522	13.8	13.5	
1.03	Convert all exterior lighting to LED lighting and install contro	0.0	9,625	0	0	1,238	0	6,800	1,238	14,100	11.4	5.9	
2.04	DHW Heater Electric to a Natural Gas Conversion	0.4	3,560	-52	0	323	0	1,139	323	12,899	39.9	36.4	
2.10	Convert AHUs w/ Electric Heat to Hydronic Heat	0.0	45,748	-1,951	0	3,862	0	14,639	3,862	33,293	8.6	4.8	
2.14	Exhaust Fan Controls Upgrade	0.0	14,877	0	0	1,914	0	4,761	1,914	12,351	6.5	4.0	
3.01	Controls Systems Upgrades	0.0	6,866	207	0	1,098	0	2,859	1,098	147,066	133.9	131.3	
3.02	Install Walk-In Refrigerator/Freezer Controls	0.6	11,596	0	0	1,180	0	3,711	1,180	8,172	6.9	3.8	
3.03	Install kitchen hood controls	0.0	1,016	487	0	636	0	1,885	636	20,808	32.7	29.7	
3.08	Add occupancy-based controls to the Vending Machines	0.2	1,612	0	0	171	0	207	171	414	2.4	1.2	
4.01	Install Low Flow Aerators	0.0	0	0	99	502	0	0	502	1,320	2.6	2.6	
	Total (recommended measures)	**5.6**	**121,602**	**-1,309**	**99**	**14,238**	**0**	**38,005**	**14,238**	**284,018**	**19.9**	**17.3**	

	Peak kW (kW)	kWh Generated (kWh)	Therm Generated (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
PV Totals	210.2	398,661	0	9,218	0	0	9,218				

	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
Building Total After PV	**5.6**	**121,602.2**	**-1,309**	**23,456**	**0**	**38,005**	**23,456**	**284,018**	**12.1**	**10.5**	

Russell O. Brackman Middle School														
Item	Name	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Water Savings (kGal)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
1.01	Convert all interior lighting to LED lighting	63.9	144,329	0	0	18,744	0	36,048	18,744	284,055	15.2	13.2	
1.02	Install occupancy/daylight/dimming controls	0.0	11,402	0	0	1,334	0	12,050	1,334	16,325	12.2	3.2	
1.03	Convert all exterior lighting to LED lighting and install control	5.3	23,386	0	0	2,665	0	11,800	2,665	26,120	9.8	5.4	
2.01	Replace Boilers, optimization controls	0.0	0	2,016	0	2,157	0	6,452	2,157	315,634	146.3	143.3	
2.02	DHW Boiler Upgrade	0.0	0	297	0	318	500	950	818	24,666	30.2	29.0	
2.05	Install VFDs on Pumps	1.0	2,959	0	0	361	0	947	361	16,280	45.1	42.4	
3.01	Controls Systems Upgrades	0.0	58,712	911	0	7,844	0	21,702	7,844	312,772	39.9	37.1	
3.02	Install Walk-In Refrigerator/Freezer Controls	0.2	4,983	0	0	502	0	1,595	502	7,691	15.3	12.2	
3.08	Add occupancy-based controls to the Vending Machines	0.8	7,193	0	0	759	0	1,224	759	2,448	3.2	1.6	
4.01	Install Low Flow Aerators	0.0	0	0	146	1,006	0	0	1,006	951	0.9	0.9	
	Total (recommended measures)	**71.3**	**252,964**	**3,224**	**146**	**35,689**	**500**	**92,767**	**36,189**	**1,006,940**	**27.8**	**25.3**	

	Peak kW (kW)	kWh Generated (kWh)	Therm Generated (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
PV Totals	406.9	1,063,339	0	30,984	0	0	30,984				

	kW Savings (kW)	kWh Savings (kWh)	Therm Savings (Therms)	Utility Savings ($)	O&M Savings ($)	Incentives ($)	Total Savings ($) (Energy + O&M)	Implementation Cost ($)	Simple Payback (Yrs)	Payback with O&M and Incentives (Yrs)	Notes
Building Total After PV	**71.3**	**252,964.4**	**3,224**	**66,674**	**500**	**92,767**	**67,174**	**1,006,940**	**15.0**	**13.6**	

6.6 Cash Flow Analysis

A cash flow analysis was conducted for the proposed ECMs, considering annual energy savings, O&M savings, energy rebates/incentives, and total project costs. Total project costs include design, construction and professional expenses. Per the ESIP requirements, cash flow savings must be positive in each year.

Please note that a 20-year term was selected. In order for this term to be approved by NJBPU, CHP must be included in the project. Section 4.6 of this report discusses the proposed CHP plant in the high school. The cost of the CHP is reflected in the table directly below as well as in the cash flow analysis on the following page. Please note that the cash flow is positive both over the life of the project and each year of the project.

Capital Cost of Non-CHP ECMs:	$5,676,827
Rounding	$173
Total Capital Cost:	$5,677,000
Interest Rate:	2.600%
Term:	18 years
Annual Energy Escalation:	2.279%
Existing Annual PPA Escalation:	2.650%
Existing Annual PPA Yr End:	6
Include Existing PPA Savings after Term	No
Proposed PPA Rate ($/kWh):	$0.045
Proposed Annual PPA Escalation:	2.000%
Proposed Annual PPA Yr End:	15
Include Proposed PPA Savings after Term	No

Year Installation	Annual Energy Savings ($)	Annual PV Savings ($)	Annual O&M Savings ($)	Energy Rebates ($)	Total Annual Savings ($)	Principal	Interest	Annual Project Cost ($)	Guarantee/ M&V Costs* ($)	Annual Cash Flow ($)	Cumulative Cash Flow ($)
0	$0	$0		$0	$0			$5,676,827	$0	$0	
1	$185,088	$149,034	($1,062)	$0	$333,060	($110,000)	($219,973)	($329,973)	$0	$3,087	$3,087
2	$189,306	$152,779	($1,062)	$230,556	$571,579	($429,000)	($139,165)	($568,165)	$0	$3,414	$6,500
3	$193,620	$156,616	($1,562)	$230,556	$579,229	($448,000)	($127,764)	($575,764)	$0	$3,465	$9,966
4	$198,032	$160,547	($1,562)	$0	$357,017	($235,000)	($118,885)	($353,885)	$0	$3,132	$13,098
5	$202,545	$164,575	($1,562)	$0	$365,558	($250,000)	($112,580)	($362,580)	$0	$2,978	$16,076
6	$207,161	$168,703	($1,562)	$0	$374,302	($265,000)	($105,885)	($370,885)	$0	$3,417	$19,492
7	$211,882	$172,932	($1,562)	$0	$383,252	($281,000)	($98,787)	($379,787)	$0	$3,465	$22,957
8	$216,710	$177,265	($1,562)	$0	$392,413	($298,000)	($91,260)	($389,260)	$0	$3,153	$26,110
9	$221,648	$181,705	($1,562)	$0	$401,790	($315,000)	($83,291)	($398,291)	$0	$3,499	$29,609
10	$226,699	$186,254	($1,562)	$0	$411,390	($333,000)	($74,867)	($407,867)	$0	$3,523	$33,132
11	$231,865	$190,914	($1,562)	$0	$421,217	($352,000)	($65,962)	($417,962)	$0	$3,255	$36,387
12	$237,149	$195,689	($1,562)	$0	$431,276	($371,000)	($56,563)	($427,563)	$0	$3,713	$40,100
13	$242,553	$200,582	($1,562)	$0	$441,573	($392,000)	($46,644)	($438,644)	$0	$2,929	$43,029
14	$248,080	$205,595	($1,562)	$0	$452,112	($413,000)	($36,179)	($449,179)	$0	$2,933	$45,962
15	$253,733	$210,730	($1,562)	$0	$462,901	($434,000)	($25,168)	($459,168)	$0	$3,733	$49,695
16	$259,515	$0	($1,562)	$0	$257,953	($238,000)	($16,432)	($254,432)	$0	$3,521	$53,216
17	$265,429	$0	($1,562)	$0	$263,867	($250,000)	($10,088)	($260,088)	$0	$3,779	$56,994
18	$271,478	$0	($1,562)	$0	$269,916	($263,000)	($3,419)	($266,419)	$0	$3,497	$60,491
19	$277,664	$0	($1,562)	$0	$276,102	$0	$0	$0	$0	$276,102	$336,593
20	$283,991	$0	($1,562)	$0	$282,429	$0	$0	$0	$0	$282,429	$619,021
Total	**$4,624,148**	**$2,673,920**	**($30,247)**	**$461,112**	**$7,728,933**	**($5,677,000)**	**($1,432,912)**	**($7,109,912)**	**$0**	**$619,021**	**$619,021**

7.0 Energy Star Portfolio Manager

The Environmental Protection Agency's (EPA's) Energy Star Portfolio Manager (ESPM) benchmarking tool was used to assess each building's energy performance. Portfolio Manager provides a site and source Energy Use Intensity (EUI), as well as an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft^2/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100, with 100 being the most efficient. For a building to receive an Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed measures, the Energy Star rating will increase.

The site EUI is the amount of heat and electricity consumed by a building as reflected in utility bills. Site energy may be delivered to a school in the form of primary energy, which is raw fuel burned to create heat or electricity, such as natural gas or oil; or as secondary energy, which is the product created from a raw fuel such as electricity or district steam. To provide an equitable comparison for different buildings with varying proportions of primary and secondary energy consumption, Portfolio Manager uses the convention of source EUIs. The source energy also accounts for losses incurred in production, storage, transmission, and delivery of energy to the site, which provide an equivalent measure for various types of buildings with differing energy sources. The results of the Portfolio Manager benchmarking tool are contained in the table below.

Please note that the numbers below are normalized for weather by EPA ESPM. They include the PPA electric usage generated by the on-site photovoltaic panels but at a multiplier of 1.0 when converting from site to source kBtu/ft^2/yr.

Building	Site EUI kBtu/ft^2/yr	Source EUI kBtu/ft^2/yr	Energy Star Rating (1-100)
Barnegat High School	63.1	128.4	42
Russell O Brackman Middle School	44.2	92.5	46
Cecil S Collins Elementary School	55.9	83.4	61
Joseph T Donahue Elementary School	52.6	104.4	41
Lillian M Dunfee Elementary School	45.0	78.8	68
Robert L Horbelt Elementary School	47.5	101.6	42

Most of the BTSD schools, excluding Dunfee and Collins have a below average Energy Star Score. By implementing the measures discussed in this ESP, it is expected that the EUI can be reduced and the energy star rating improved. There is potential for Energy Star Certification through the DOE for some of the schools, but will be dependent on final selection of ECMs.

The Portfolio Manager account can be accessed by entering the username and password shown below at the login screen of the Portfolio Manager website (https://www.energystar.gov/istar/pmpam/).

A full EPA Energy Star Portfolio Manager Report is in Appendix E. The username and password for the building's EPA Portfolio Manager Account has been provided by CHA to BTSD.

8.0 Greenhouse Gas Emission Reductions

According to the Energy Information Administration (EIA), Greenhouse Gasses (GHG) are chemical compounds found in the Earth's atmosphere which absorb infrared radiation and trap it as heat in the atmosphere. Some GHGs occur in nature such as water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x) and sulfuric oxide (SO_x); while others are manmade. The concentrations of naturally occurring GHG are regulated by the Earth in a process known as the *Carbon Cycle*. However, over the past 150 years humans have contributed to a positive imbalance between GHG emissions and absorption through the *Carbon Cycle*. This has resulted in the continuing growth of GHG in the atmosphere.

By reducing facility electrical and natural gas usage through the implementation of energy efficient building design and equipment, a facility can help reduce their impact on the environment and help reduce GHG emissions. A reduction in electrical usage in the form of kWh corresponds to a reduction in electricity generated at a given power plant or plants. Usually electricity is generated by a variety of different methods and distributed on the grid. A breakdown of the fuel mix sources can be seen in the following table. Each fuel mix source contributes a different amount of CO_2, NO_x and SO_x to the environment. The GHG emissions reduction is collectively measures as metric tons of carbon dioxide equivalent (MTCDE).

Zip Code:	**08005**	**National Avg**
Non-Hydro Renewables	3.2%	4.2%
Hydro	2.0%	6.8%
Nuclear	38.9%	20.2%
Oil	0.5%	1.1%
Natural Gas	39.6%	23.2%
Coal	15.5%	44.5%
Total	**100%**	**100%**

The following energy reduction and effect on GHG emissions has been quantified:

Total Annual Electrical Savings:	1,270,548	kWh
Total Annual PV Electric Generation:	2,779,017	kWh
Total Annual Electric Grid Reduction:	**4,049,602**	**kWh**
Total Annual Natural Gas Reduction:	**12,894**	**Therms**
Total Annual GHG Emission Reductions:	**1,781**	**MTCDE**

9.0 Maintenance Requirements

Routine maintenance can help keep equipment operating optimally and can extend equipment life. The scope of the ECMs covered in this ESP do not recommend changes, upgrades, or replacements that will significantly impact existing maintenance requirements, with the exception to the proposed CHP. The proposed CHP will have additional maintenance requirements that will include, but are not limited to, periodic inspection and servicing, performance monitoring and fault diagnostics, equipment repairs, and routine state and local government inspections. This ESP does not recommend the elimination of any maintenance contracts or the reduction of staff to account for any potential decrease in maintenance requirements due to the installation of new equipment proposed by the scope of this ESP.

10.0 Design Phase

10.1 Overview

In order to properly comply with local building codes, compliance issues and New Jersey Public contract law, BTSD will be required to secure the services of a New Jersey Licensed Engineering firm and/or Architectural firm as part of the implementation process. Specifications will be designed and developed in order to achieve all savings outlined in this ESP. Once specifications are completed, BTSD will solicit contractors capable of meeting the requirements of the specification for each trade. Spiezle (BTSD's Architect) and the selected engineer will be providing construction and project management services in order to maintain a schedule. An overview of these activities and functions are detailed below.

10.2 Construction Documents (CD) Phase

As part of this task, Spiezle and the selected engineer will provide construction drawings for the design and installation of recommended ECMs. Design engineers and Spiezle architects will perform site visits for field investigation to survey existing installation and to determine modifications required to successfully implement the ECMs. Plans and specifications will be prepared as follows: one (1) set of 60% and 90% construction drawings and specifications for review and comment, and one (1) set of final construction drawings and specifications.

Please note that based on discussions with facility personnel, all areas of work are expected to be free of asbestos or any hazardous material, and there is expected to be enough power in each building for the additional power requirements related to the ECMs.

10.3 Bidding and Award Phase

As part of this task, Spiezle and the selected engineer will assist BTSD by providing bidding services, attending a pre-Bid walk-through and bid opening, responding to bidders' questions, providing input for Addenda as necessary (to be issued by Spiezle), and providing recommendations based on Technical Evaluation of the Bids. BTSD will prepare and assemble the bid documents including Front End documents, and will issue Addenda, clarifications and/or responses to RFIs to bidding contractors.

10.4 Construction Phase

As part of this task, Spiezle and the selected engineer will provide construction administration services, including reviewing contractor's shop drawings, reviewing and responding to contractor's Request for Information (RFI), reviewing and making recommendations for approval of contractor's payment applications and requests for change orders, conducting field visits of the project sites during construction, conducting punch list walkthrough and preparing punch list of remaining work to be repaired or completed, and reviewing Record Drawings (As-Built) and Operation & Maintenance Manuals.

The construction period is common for all the buildings and estimated to be 6 months from the date of award of the selected contractor. Permit applications will be prepared by Spiezle.

11.0 Potential Risks

Any investment carries some degree of risk, including energy projects, thus it would be irresponsible not to consider that dimension in this ESP. The following present some of the risks involved:

- BTSD has chosen to pursue the DIY approach to implement this ESP. As such, an ESCO is not being contracted for the implementation of the ESP, and a guarantee will not be secured. Unlike the ESCO model, which puts all the responsibility onto the ESCO, the DIY model requires a high degree of owner involvement for success.
- Multiple contracts will be required with multiple vendors and contractors. As such, each contractor's accountability for project performance needs to be checked. Some measures will be implemented using BTSD maintenance staff to manage implementation costs.
- Failure to implement the ECMs in a timely manner can cost BTSD in the form of lost savings, and can add cost to the project (e.g., construction interest, re-mobilization).
- BTSD generally has control over operating hours. Increases and decreases in operating hours can show up as increases or decreases in "savings". BTSD will need to be diligent about equipment scheduling and maintaining control of equipment so that it remains scheduled and properly set back or shut off by the control system.
- BTSD will also need to be careful to not over-schedule equipment for events outside of normal school hours. The upgraded control system will need to allow for improved functionality and efficiency of HVAC scheduling, through event schedules and other strategies. This will reduce unnecessary runtime and needs to result in a reduced runtime of the existing equipment (compared to today) in order for this project to be successful and for the savings to be met.
- Some of the existing air handling equipment in the various buildings has failed over time and during the audit was shut down and not bringing in the desired amount of ventilation. This reduced ventilation decreases energy usage of the school. If these units are brought back online during the course of the term of the project, energy usage will increase with the corresponding increase in ventilation. This will appear as a reduction in savings even though it is bringing the building back to where it should have been operating all along.
- Equipment loads can change over time. BTSD generally has control over hours of operation, conditioned floor area, intensity of use (e.g., changes in occupancy or level of automation). Changes in load can show up as increases or decreases in "savings".
- Several energy efficiency measures are affected by weather. All assessments of achieved savings should be normalized for weather.
- Many energy conservation measures require user participation to generate savings (e.g., control settings). BTSD will need to decide to what degree monitoring and training will be necessary to mitigate risk.
- Performance of day-to-day maintenance activities can impact performance.

Appendix A: LGEA Reports

Local Government Energy Audit Report

Cecil S. Collins Elementary School and Board Offices

October 31, 2019

Prepared for:
Barnegat Township School District
550, 570 Barnegat Blvd North
Barnegat, New Jersey 08005

Prepared by:
TRC
900 Route 9 North
Woodbridge, New Jersey 07095

Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC Companies, Inc. reviewed the energy conservation measures and estimates of energy savings were reviewed for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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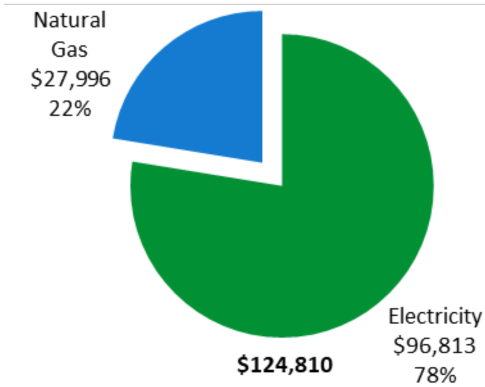
Table of Contents

1 Executive Summary

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Cecil S. Collins Elementary School and Board Offices. This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in your facility. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $124,810 Electricity: 752,922 kWh Natural Gas: 26,602 Therms	
ENERGY STAR® Benchmarking Score	69 *(1-100 scale)*	Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance and lower your energy bills even more.

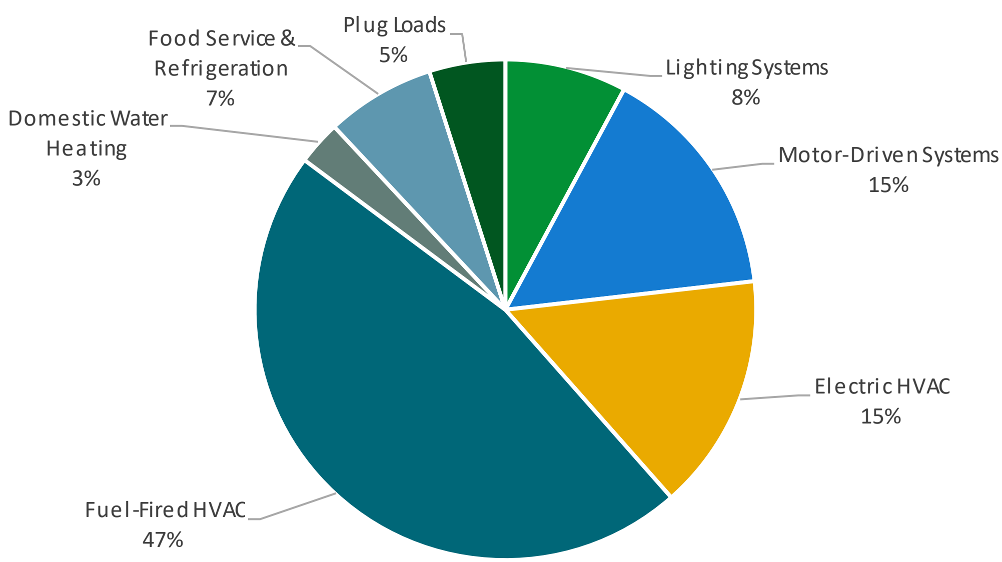


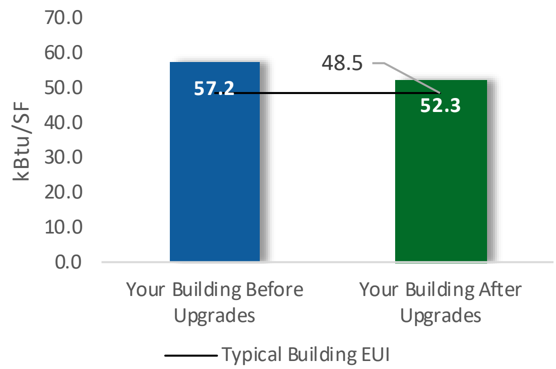
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

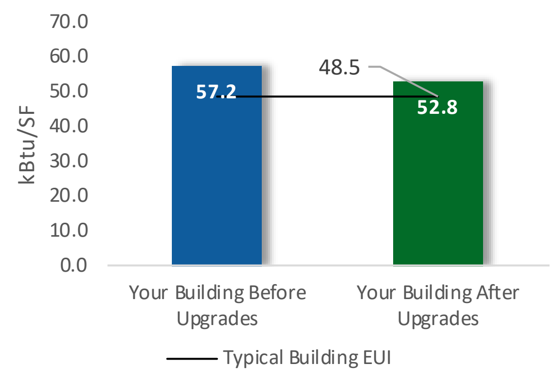
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$149,158
Potential Rebates & Incentives[1]	$11,728
Annual Cost Savings	$16,226
Annual Energy Savings	Electricity: 124,597 kWh Natural Gas: 195 Therms
Greenhouse Gas Emission Savings	64 Tons
Simple Payback	8.5 Years
Site Energy Savings (all utilities)	9%



Scenario 2: Cost Effective Package[2]

Installation Cost	$80,937
Potential Rebates & Incentives	$8,916
Annual Cost Savings	$14,813
Annual Energy Savings	Electricity: 114,281 kWh Natural Gas: 112 Therms
Greenhouse Gas Emission Savings	58 Tons
Simple Payback	4.9 Years
Site Energy Savings (all utilities)	8%



On-site Generation Potential

Photovoltaic	Medium
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	*Cost Effective?*	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**8,526**	**2.7**	**-2**	**$1,079**	**$3,877**	**$1,021**	**$2,856**	**2.6**	**8,389**
ECM 1	Retrofit Fixtures with LED Lamps	Yes	8,526	2.7	-2	$1,079	$3,877	$1,021	$2,856	2.6	8,389
Lighting Control Measures			**27,126**	**5.4**	**-6**	**$3,428**	**$24,071**	**$2,515**	**$21,556**	**6.3**	**26,651**
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	23,653	4.7	-5	$2,989	$20,021	$2,515	$17,506	5.9	23,240
ECM 3	Install High/Low Lighting Controls	Yes	3,472	0.7	-1	$439	$4,050	$0	$4,050	9.2	3,411
Variable Frequency Drive (VFD) Measures			**78,045**	**20.4**	**0**	**$10,035**	**$52,766**	**$5,380**	**$47,386**	**4.7**	**78,591**
ECM 4	Install VFDs on Constant Volume (CV) Fans	Yes	78,045	20.4	0	$10,035	$52,766	$5,380	$47,386	4.7	78,591
Electric Unitary HVAC Measures			**10,315**	**5.8**	**0**	**$1,326**	**$63,880**	**$2,662**	**$61,218**	**46.2**	**10,388**
ECM 5	Install High Efficiency Air Conditioning Units	No	10,315	5.8	0	$1,326	$63,880	$2,662	$61,218	46.2	10,388
Domestic Water Heating Upgrade			**584**	**0.0**	**27**	**$357**	**$4,562**	**$150**	**$4,412**	**12.3**	**3,730**
ECM 6	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	8	$87	$4,340	$150	$4,190	48.3	964
ECM 7	Install Low-Flow DHW Devices	Yes	584	0.0	19	$271	$222	$0	$222	0.8	2,766
TOTALS (COST EFFECTIVE MEASURES)			**114,281**	**28.4**	**11**	**$14,813**	**$80,937**	**$8,916**	**$72,021**	**4.9**	**116,397**
TOTALS (ALL MEASURES)			**124,597**	**34.2**	**19**	**$16,226**	**$149,158**	**$11,728**	**$137,429**	**8.5**	**127,749**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Retrofit Fixtures with LED Lamps	x	x	
ECM 2	Install Occupancy Sensor Lighting Controls	x	x	
ECM 3	Install High/Low Lighting Controls		x	
ECM 4	Install VFDs on Constant Volume (CV) HVAC	x	x	
ECM 5	Install High Efficiency Electric AC	x	x	
ECM 6	Install High Efficiency Gas Water Heater	x	x	
ECM 7	Install Low-Flow Domestic Hot Water Devices		x	

Figure 3 – Funding Options

New Jersey's Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Cecil S. Collins Elementary School and Board Offices. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see **Appendix A: Equipment Inventory & Recommendations.**

2.1 Site Overview

On July 2, 2019, TRC performed an energy audit at Cecil S. Collins Elementary School and Board Offices, located in Barnegat, New Jersey. TRC met with Neil Piro to review the facility operations and help focus our investigation on specific energy-using systems.

Cecil S. Collins Elementary School and Board Offices is combined in this report as a multi-story, 91,429 square foot complex. The school was built in 1980, and the office space was built in 2003. Spaces in the school include classrooms, a gymnasium, offices, a cafeteria, corridors, stairwells, a commercial kitchen, and mechanical space.

The elementary school and the board of education offices share the same electric meter.

The elementary school is 100% heated and cooled. The site HVAC operations are controlled using EMS. The most recent renovation in the building was performed in 2016.

The BOE office building is a 100% electrically heated and cooled.

2.2 Building Occupancy

The elementary school is occupied from September through June during the hours mentioned in the table below. Typical weekday occupancy is 100 full time staff and 511 students. The office building is occupied year-round by 15 full-time staff.

Building Name	Weekday/Weekend	Operating Schedule
Cecil S Collins Elementary School	Weekday	5:30 AM - 6:30 PM
	Weekend	Saturday: Gym operation only 7:00 AM - 3:00 PM Sunday: No Operation
Barnegat Township Board Office	Weekday	8:00 AM - 5:00 PM
	Weekend	No Operation

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Cecil S. Collins Elementary School walls are concrete block over structural steel with a brick over blocks facade. The roof is flat with white rubber layering. The walls are made of painted concrete masonry units. The windows are double-glazed and have aluminum frames with a thermal break. The weather seals were observed to have leakage. The operable window weather seals are in good condition, showing little evidence of excessive wear. Exterior doors are aluminum good condition with undamaged door seals.

Exterior ***D***oors

Window

Roof

Facade

The BOE office building walls are sheet metal over insulation of wood framing. The roof is flat and covered with black rubber membrane, and it is in good condition. The dividing walls within the building includes drywalls, metal studs, and wood. The windows are double-pane with vinyl frames and are in fair condition. The exterior doors are made of metal and in good condition.

Roof

Façade and Windows

2.4 Lighting Systems

Cecil S. Collins Elementary School: The primary interior lighting system uses 14-watt linear LED lamps and 32-Watt linear fluorescent T8 lamps (2- or 3- lamp) fixtures serving large spaces such as the gym, cafeteria, classrooms, and corridors. There are also several 10-watt LED lamp fixtures and 60-watt incandescent lamps fixtures serving smaller spaces, such as restrooms and storage spaces. The lighting fixtures in the building uses electronic ballasts. Most fixtures are in good condition. All exit signs are LED units.

Interior lighting levels were generally sufficient. All interior spaces in the rooms are controlled using wall switches.

Most exterior lighting fixtures are LED fixtures that are wall, canopy, or pole-mounted ranging from 40 to 300W. The fixtures are controlled using timeclock and photocells.

Linear T8 Tubes

Wall-mounted LED Fixtures

Pole-mounted LED Fixtures

LED Fixtures

BOE Office: The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps with electronic ballasts. Fixture types include 2- or 3-lamp, 2- or 4-foot long troffers. Most fixtures are in good condition. All interior fixtures are controlled using wall switches.

All exit signs are LED units. Interior lighting levels were generally sufficient.

The exterior lights consist of 23-watt compact fluorescent lamp fixture and 42-watt LED wall-mounted fixtures. Exterior fixtures are controlled using photocells.

Exterior Light Fixtures

Interior Linear T8 Fixtures

2.5 Air Handling Systems

Unit Ventilators – Cecil S. Collins Elementary School

There are 33 pneumatically controlled heating unit ventilators with hot water coils equipped with supply fan motors, outside air dampers and fan coil valves. This system is original to the building and appears to be in fair operating condition.

Packaged Units

Cecil S. Collins Elementary School: Many of the building areas are served using packaged units with cooling capacities ranging from 5- to 22-tons. Most of these units have built-in gas-fired furnace sections that provide heat to the respective zones. The units are controlled by the EMS. These units have EER ratings ranging from 9.1 to 9.2.

The cooling setpoint in the facility is between 71ºF – 73ºF. Many of the units are still within their useful life; the older units are evaluated for replacement.

BOE Office: Building areas are served by six packaged AC (ICP) units of 3-ton cooling capacity and an EER of 10. The units have forced air electric heaters with heating capacity of 10 kW that provide space heating to respective zones. The zone temperatures are controlled using programmable thermostats.

The units were installed in 2003 and are aged past their useful life. These have hence been evaluated for replacement.

Air Conditioners

Cecil S. Collins Elementary School: The music room is cooled using a window AC unit with a cooling capacity 0.67 tons and an EER of 8.3. An office area is cooled using a split AC unit of 1-ton cooling capacity and an EER of 10.4. Both of these units are aged beyond the useful life of the equipment and have been evaluated for replacement.

Window AC

Split AC Unit

Packaged Unit with Gas-fired Furnace

Unit Ventilators

Air Conditioners

BOE Office: The server closet in the building is cooled using a 2-ton Samsung split AC unit with an EER of 10.8. This unit was installed in 2005 and has been evaluated for replacement.

Packaged AC and Heater

Thermostat

Split AC Unit

Packaged AC and Heater

2.6 Heating Hot Water Systems

The elementary school has two (AERCO) gas-fired hot water condensing boilers serving the building heating load. The burners are fully modulating with a nominal efficiency of 93%. The boilers are configured in a lead-lag control scheme. Both boilers are required under high load conditions. Installed in 2012, they are in good condition.

The boilers are configured in a variable flow primary distribution with two 5hp VFD controlled hot water pumps operating in a lead-lag control scheme. The boilers provide hot water to unit ventilators and heating and ventilating units.

The occupied heating setpoint in the facility is 70°F, and the temperature is controlled using EMS.

Condensing Boiler

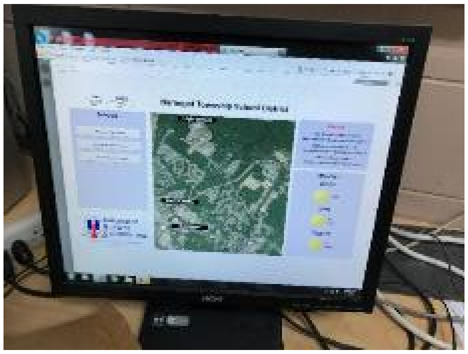
Air Compressor

Heating Hot Water Pump

VFD

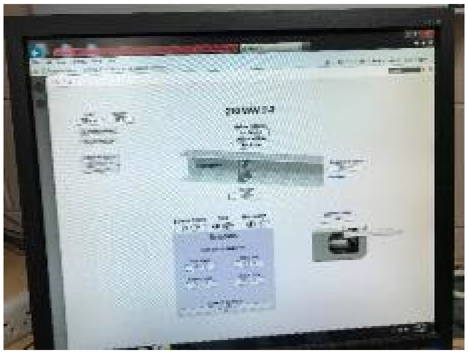
2.7 Building Energy Management Systems (EMS)

The elementary school has a Johnson Controls EMS that controls the HVAC equipment, boilers, air handlers, and package units. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, and humidity and heating water loop temperatures.



EMS

EMS



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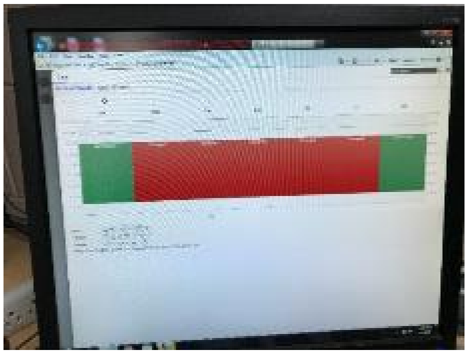


EMS

2.8 Domestic Hot Water

Cecil S. Collins Elementary School: Hot water is produced by a 75-gallon 75.1 MBh gas-fired storage water heater at 70% efficiency. The water heater was installed in 2009 and is in fair condition and maintained well.

Hot Water Heater

BOE Office: Hot water is produced by a 6-gallon 6.6 kW electric storage water heater. The water heater was installed in 2003 and is in good condition and maintained well.

Hot Water Heater

2.9 Food Service and Refrigeration Equipment

The elementary school kitchen has mix of gas and electric equipment that is used to prepare lunches for students. Most cooking is done using a conventional gas-fired electric oven and an electric stove. Bulk prepared foods are held in several electric holding cabinets. Equipment is high-efficiency and in good condition.

The kitchen has several stand-up refrigerators, freezers, and freezer chests. All equipment is high-efficiency and in good condition.

The walk-in refrigerator has an estimated 0.6-ton compressor and a two-fan evaporator. The walk-in medium temperature freezer has a 1.0-ton compressor and a three-fan evaporator.

Our analysis determined that this building's food service equipment accounts for a relatively high proportion of overall energy use. While cost-effective opportunities to replace equipment are limited at this time, we recommend that you work with your food service equipment suppliers to maintain equipment in a way that minimizes energy use. This may include cleaning air intakes and exhausts or other methods of keeping your existing equipment operating in top shape. When food service equipment is eventually replaced consider installing high-efficiency or ENERGY STAR labeled equipment.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high-efficiency food service equipment.

Reach-in Refrigerator

Electric Stove

Food Holding Cabinet

Walk-in Unit

2.10 Plug Load & Vending Machines

The utility bill analysis for the elementary school and the BOE office indicates that plug loads consume approximately 5% percent of total building energy use. This is higher than a typical building.

You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area, as well as Energy Efficient Best Practices.

In the elementary school, there are approximately 127 computer work stations throughout the facility. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as Smart Boards, projectors, and fans.

There are several residential-style refrigerators throughout the building that are used to store food by staff. These vary in condition and efficiency.

The BOE office has approximately 20 computer work stations throughout the facility. Plug loads throughout the building include general café and office equipment.

2.11 Water-Using Systems

In the elementary school there are 28 faucets with flow rates are at 2.2 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

In the BOE office there are three faucets with flow rates are at 2.2 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gpf.

2.12 On-Site Generation

The Cecil S. Collins Elementary School has a photovoltaic (PV) array that was installed in 2011. This system provides approximately 82% of the electricity used at this facility.

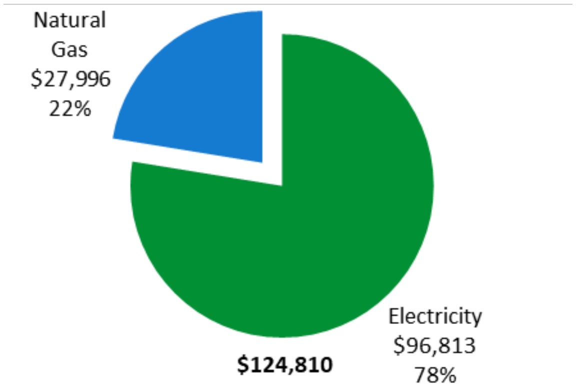
Solar Array

Solar Array

3 Energy Use and Costs

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	752,922 kWh	$96,813
Natural Gas	26,602 Therms	$27,996
Total		**$124,810**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

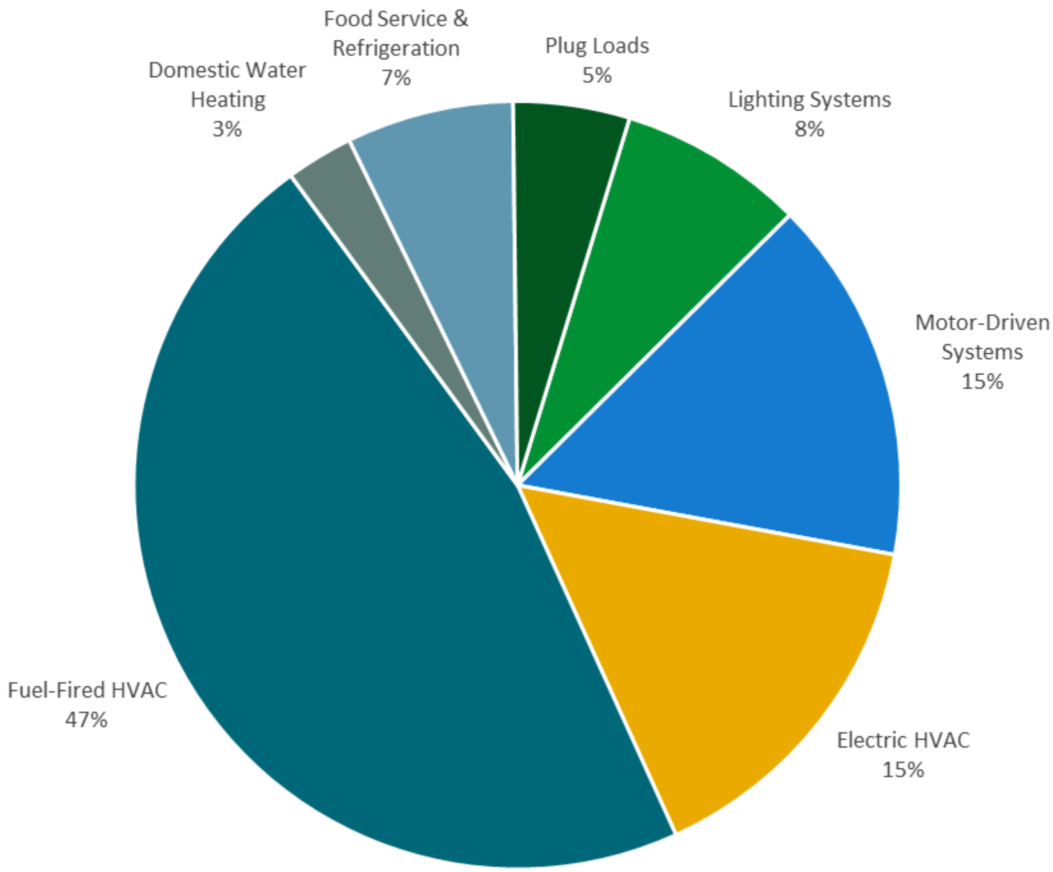
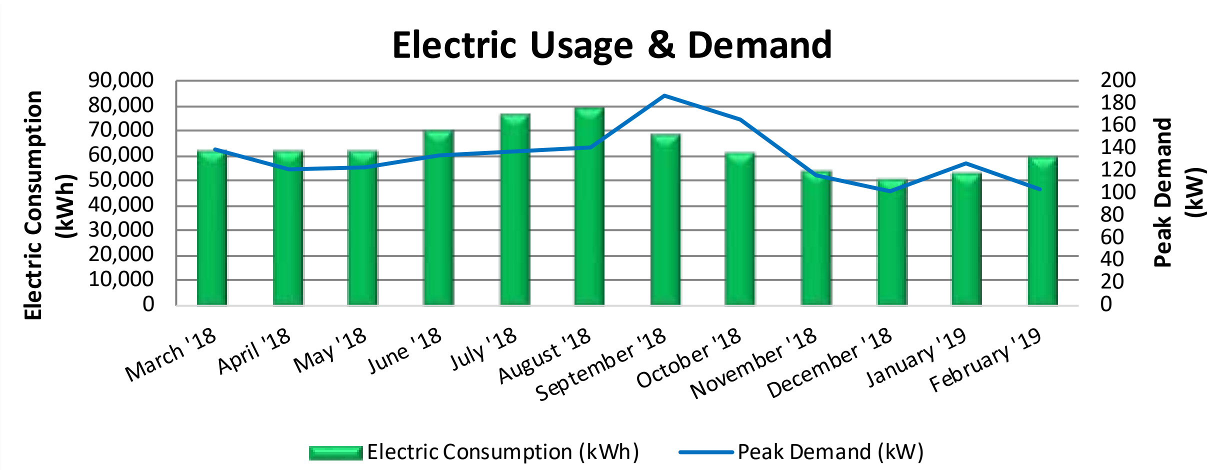


Figure 5 - Energy Balance

3.1 Electricity

JCP&L delivers electricity under rate class GSS.



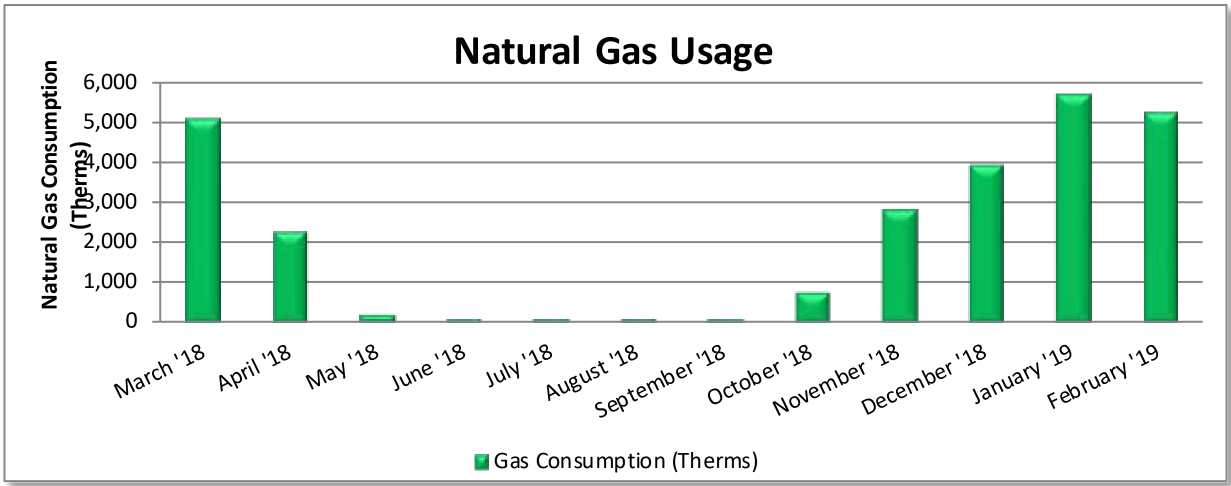
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
3/27/18	30	61,399	139	$853	$8,090
4/25/18	29	61,726	121	$701	$8,127
5/25/18	30	61,843	124	$713	$8,163
6/26/18	32	69,754	134	$834	$8,902
7/26/18	30	75,797	137	$856	$9,527
8/27/18	32	78,563	140	$878	$9,738
9/26/18	30	68,026	187	$1,190	$9,178
10/25/18	29	61,002	166	$980	$8,246
11/27/18	33	53,861	116	$665	$6,263
12/27/18	30	50,817	102	$577	$6,527
1/25/19	29	52,618	126	$730	$6,826
2/26/19	32	59,578	103	$581	$7,491
Totals	**366**	**754,985**	**187**	**$9,558**	**$97,079**
Annual	**365**	**752,922**	**187**	**$9,532**	**$96,813**

Notes:

- Peak demand of 187 kW occurred in September '18.
- The average electric cost over the past 12 months was $0.129/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

New Jersey Natural Gas delivers natural gas under rate class GSL.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
4/5/18	30	5,061	$4,737
5/2/18	27	2,283	$2,104
6/1/18	30	214	$477
7/3/18	32	117	$424
8/2/18	30	97	$408
8/28/18	26	98	$408
10/1/18	34	136	$477
11/1/18	31	781	$972
12/1/18	30	2,820	$2,537
1/2/19	32	3,940	$4,548
2/1/19	30	5,674	$5,770
3/4/19	31	5,233	$4,981
Totals	**363**	**26,456**	**$27,843**
Annual	**365**	**26,602**	**$27,996**

Notes:

- The average gas cost for the past 12 months is $1.052/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

Benchmarking Score	69

Due to its unique characteristics, this building type is not able to receive a benchmarking score. This report contains suggestions about how to improve building performance and reduce energy costs.

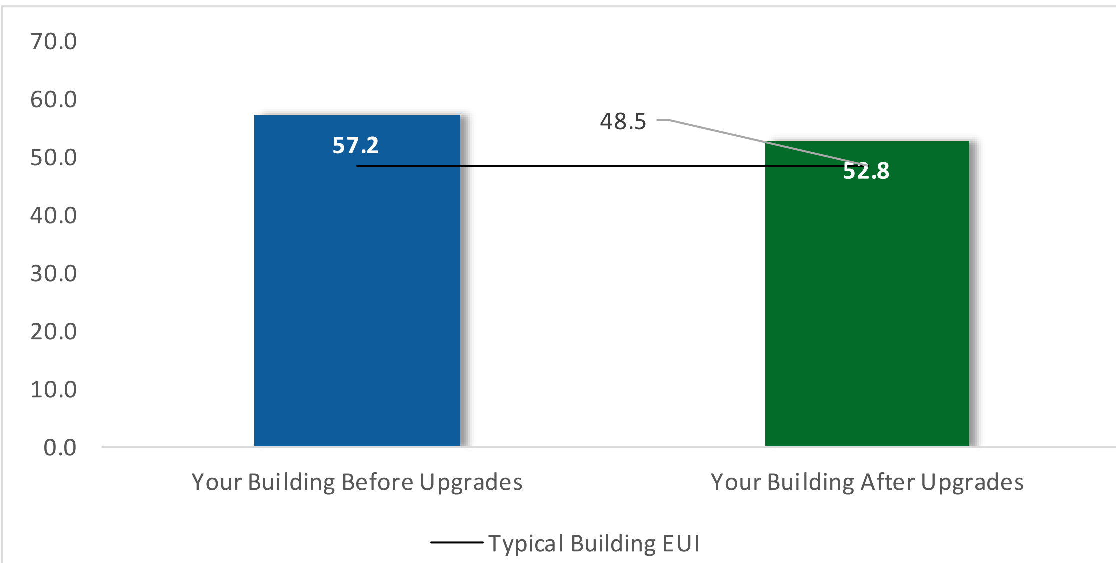


Figure 6 - Energy Use Intensity Comparison

Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance, and lower your energy bills even more.

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause as building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 ENERGY CONSERVATION MEASURES

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**8,526**	**2.7**	**-2**	**$1,079**	**$3,877**	**$1,021**	**$2,856**	**2.6**	**8,389**
ECM 1	Retrofit Fixtures with LED Lamps	8,526	2.7	-2	$1,079	$3,877	$1,021	$2,856	2.6	8,389
Lighting Control Measures		**27,126**	**5.4**	**-6**	**$3,428**	**$24,071**	**$2,515**	**$21,556**	**6.3**	**26,651**
ECM 2	Install Occupancy Sensor Lighting Controls	23,653	4.7	-5	$2,989	$20,021	$2,515	$17,506	5.9	23,240
ECM 3	Install High/Low Lighting Controls	3,472	0.7	-1	$439	$4,050	$0	$4,050	9.2	3,411
Variable Frequency Drive (VFD) Measures		**78,045**	**20.4**	**0**	**$10,035**	**$52,766**	**$5,380**	**$47,386**	**4.7**	**78,591**
ECM 4	Install VFDs on Constant Volume (CV) Fans	78,045	20.4	0	$10,035	$52,766	$5,380	$47,386	4.7	78,591
Electric Unitary HVAC Measures		**10,315**	**5.8**	**0**	**$1,326**	**$63,880**	**$2,662**	**$61,218**	**46.2**	**10,388**
ECM 5	Install High Efficiency Air Conditioning Units	10,315	5.8	0	$1,326	$63,880	$2,662	$61,218	46.2	10,388
Domestic Water Heating Upgrade		**584**	**0.0**	**27**	**$357**	**$4,562**	**$150**	**$4,412**	**12.3**	**3,730**
ECM 6	Install High Efficiency Gas-Fired Water Heater	0	0.0	8	$87	$4,340	$150	$4,190	48.3	964
ECM 7	Install Low-Flow DHW Devices	584	0.0	19	$271	$222	$0	$222	0.8	2,766
TOTALS		**124,597**	**34.2**	**19**	**$16,226**	**$149,158**	**$11,728**	**$137,429**	**8.5**	**127,749**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**8,526**	**2.7**	**-2**	**$1,079**	**$3,877**	**$1,021**	**$2,856**	**2.6**	**8,389**
ECM 1	Retrofit Fixtures with LED Lamps	8,526	2.7	-2	$1,079	$3,877	$1,021	$2,856	2.6	8,389
Lighting Control Measures		**27,126**	**5.4**	**-6**	**$3,428**	**$24,071**	**$2,515**	**$21,556**	**6.3**	**26,651**
ECM 2	Install Occupancy Sensor Lighting Controls	23,653	4.7	-5	$2,989	$20,021	$2,515	$17,506	5.9	23,240
ECM 3	Install High/Low Lighting Controls	3,472	0.7	-1	$439	$4,050	$0	$4,050	9.2	3,411
Variable Frequency Drive (VFD) Measures		**78,045**	**20.4**	**0**	**$10,035**	**$52,766**	**$5,380**	**$47,386**	**4.7**	**78,591**
ECM 4	Install VFDs on Constant Volume (CV) Fans	78,045	20.4	0	$10,035	$52,766	$5,380	$47,386	4.7	78,591
Domestic Water Heating Upgrade		**584**	**0.0**	**19**	**$271**	**$222**	**$0**	**$222**	**0.8**	**2,766**
ECM 7	Install Low-Flow DHW Devices	584	0.0	19	$271	$222	$0	$222	0.8	2,766
TOTALS		**114,281**	**28.4**	**11**	**$14,813**	**$80,937**	**$8,916**	**$72,021**	**4.9**	**116,397**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**8,526**	**2.7**	**-2**	**$1,079**	**$3,877**	**$1,021**	**$2,856**	**2.6**	**8,389**
ECM 1	Retrofit Fixtures with LED Lamps	8,526	2.7	-2	$1,079	$3,877	$1,021	$2,856	2.6	8,389

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources is proposed, we suggest converting all fixtures of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the facility, which should help reduce future maintenance costs.

ECM 1: Retrofit Fixtures with LED Lamps

Replace fluorescent or CFL with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as direct replacements for most other lighting technologies.

This measure saves energy by installing LEDs, which use less power than other lighting technologies while providing equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes or CFL.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**27,126**	**5.4**	**-6**	**$3,428**	**$24,071**	**$2,515**	**$21,556**	**6.3**	**26,651**
ECM 2	Install Occupancy Sensor Lighting Controls	23,653	4.7	-5	$2,989	$20,021	$2,515	$17,506	5.9	23,240
ECM 3	Install High/Low Lighting Controls	3,472	0.7	-1	$439	$4,050	$0	$4,050	9.2	3,411

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 2: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote-mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected building areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms.

ECM 3: Install High/Low Lighting Controls

Install occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low levels after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

The control lowers the light level by dimming the fixture output. Therefore, the controlled fixtures need to have a dimmable ballast or driver. This will need to be taken into account when selecting retrofit lamps and bulbs for the areas proposed for high/low control.

This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

Affected building areas: hallways.

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**78,045**	**20.4**	**0**	**$10,035**	**$52,766**	**$5,380**	**$47,386**	**4.7**	**78,591**
ECM 4	Install VFDs on Constant Volume (CV) Fans	78,045	20.4	0	$10,035	$52,766	$5,380	$47,386	4.7	78,591

Variable frequency drives (VFDs) control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor to conservatively account for the cost of an inverter duty rated motor.

Premium efficiency motors have been proposed to be installed only in conjunction with proposed VFD motor measures. Non-inverter duty rated motors will need to be replaced when the VFD measure is implemented.

ECM 4: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air-handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone while maintaining a constant supply air temperature.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: gym HV C-1, cafe RTU-3, RTU-B1 & D1, RTU-C1, café RTU-4.

4.4 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**10,315**	**5.8**	**0**	**$1,326**	**$63,880**	**$2,662**	**$61,218**	**46.2**	**10,388**
ECM 5	Install High Efficiency Air Conditioning Units	10,315	5.8	0	$1,326	$63,880	$2,662	$61,218	46.2	10,388

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units at this facility are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high-efficiency unit can be justified by the marginal savings from the improved efficiency. When the window AC, split AC unit, and packaged units in the elementary schools and office building are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 5: Install High-Efficiency Air Conditioning Units

Replace standard efficiency packaged air conditioning units with high-efficiency packaged air conditioning units. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high-efficiency unit, average cooling load, and estimated annual operating hours.

4.5 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**584**	**0.0**	**27**	**$357**	**$4,562**	**$150**	**$4,412**	**12.3**	**3,730**
ECM 6	Install High Efficiency Gas-Fired Water Heater	0	0.0	8	$87	$4,340	$150	$4,190	48.3	964
ECM 7	Install Low-Flow DHW Devices	584	0.0	19	$271	$222	$0	$222	0.8	2,766

ECM 6: Install High-Efficiency Gas-Fired Water Heater

Replace the existing natural gas tank water heater with a high-efficiency gas tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water, and fewer operating hours to maintain the tank water temperature.

ECM 7: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low-flow devices are recommended to reduce hot water usage:

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing. Pre-rinse spray valves—often used in commercial and institutional kitchens—remove food waste from dishes prior to dishwashing.

Additional cost savings may result from reduced water usage.

5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

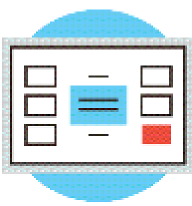
Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[4]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly.

Thermostat Schedules and Temperature Resets



Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan, and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

Boiler Maintenance

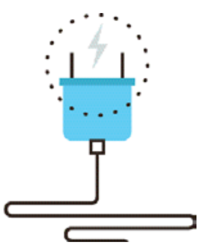
Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

Water Heater Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

Computer Power Management Software

Many computers consume power during nights, weekends, and holidays. Screen savers are commonly confused as a power management strategy. This contributes to avoidable, excessive electrical energy consumption. There are innovative power management software packages available that are designed to deliver significant energy saving and provide ongoing tracking measurements. A central power management platform helps enforce energy savings policies as well as identify and eliminate underutilized devices.

[5] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense™ products where available.

6 On-site Generation

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the facility's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for your facility. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

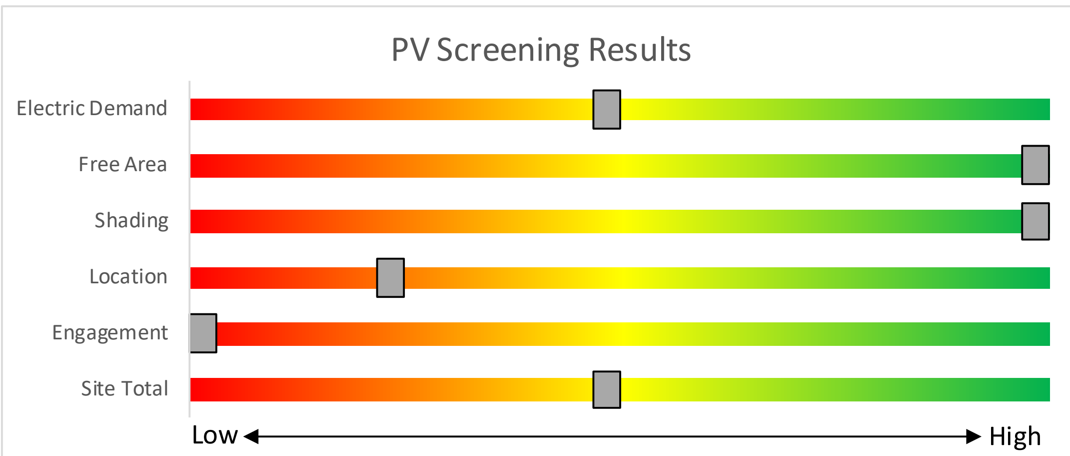
6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has **medium** potential for installing an additional PV array.

The amount of free area, ease of installation (roof), and the lack of shading elements contribute to the medium potential in the elementary school. A PV array located in the parking lot be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	Medium	
System Potential	133	kW DC STC
Electric Generation	158,452	kWh/yr
Displaced Cost	$20,370	/yr
Installed Cost	$449,500	

Figure 9 - Photovoltaic Screening

Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

- **Basic Info on Solar PV in New Jersey**: www.njcleanenergy.com/whysolar
- **New Jersey Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the New Jersey Market**: www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

6.2 Combined Heat and Power

Combined heat and power (CHP) generate electricity at the facility and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

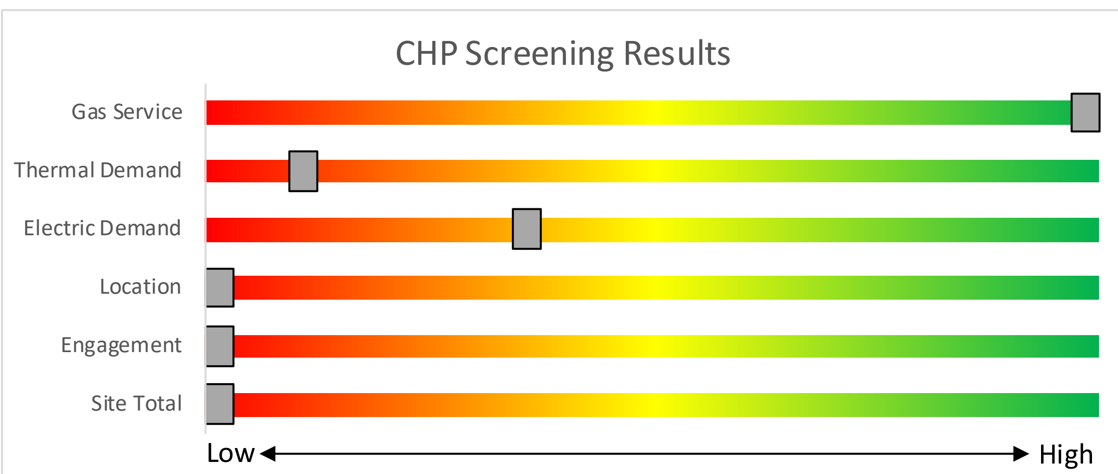
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has **no** potential for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. Low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	None	
System Type	None	
System Potential	10	kW
Electric Generation	12,876	kWh/yr
Thermal Generation	299,582	MBtu/yr
Displaced Cost	$496	/yr
Installed Cost	$23,000	

Figure 10 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

7 Project Funding and Incentives

Ready to improve your building's performance? Pick the program that works best for you. Incentive programs that may apply to this facility are identified in the Executive Summary. This section provides an overview of currently available New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for

program details, applications, and to contact a qualified contractor.

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at your facility. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficient equipment based on market trends and new technologies.

<u>Equipment with Prescriptive Incentives Currently Available</u>:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

Incentives

Incentives are based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

Contact one of the pre-approved consultants and contractors (“Partners”). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan, assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine	>3 MW	$350		
Fuel Cells with Heat Recovery				
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at: [www.njcleanenergy.com/CHP.](http://www.njcleanenergy.com/CHP)

7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the energy savings plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.6 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: [www.njcleanenergy.com/srec.](www.njcleanenergy.com/srec)

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[6].

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier typically depends on whether a customer prefers budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[7].

[6] www.state.nj.us/bpu/commercial/shopping.html

[7] www.state.nj.us/bpu/commercial/shopping.html

TRC

New Jersey's cleanenergy program™

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Electrical room	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Generator room	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Boiler room	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Maintenance break room	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Maintenance restroom	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Maintenance restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
Custodian area	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	172	0	$22	$116	$20	4.4
Custodian area	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Multi purpose room	20	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	688	0	$87	$540	$70	5.4
Multi purpose room	20	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	688	0	$87	$540	$70	5.4
Multi purpose room	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen	36	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	36	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Kitchen office	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.0	206	0	$26	$116	$20	3.7
Kitchen restroom	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,480	0.0	0	0	$0	$0	$0	0.0
Kitchen toilet	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
Kitchen entrance	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Kitchen entrance	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen storage	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,480		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,480	0.0	0	0	$0	$0	$0	0.0
Kitchen storage room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,480	1, 2	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	482	0	$61	$226	$30	3.2
Kitchen	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,480	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	126	0	$16	$37	$10	1.7
236 Music	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	138	0	$17	$116	$20	5.5
Electrical room	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Custodian closet	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Girls bathroom	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,480	2	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,401	0.0	206	0	$26	$270	$0	10.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Men's restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
Women's restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
225 SC51	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	103	0	$13	$116	$20	7.4
225 SC51	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,480	2	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,401	0.0	138	0	$17	$116	$20	5.5
Boys restroom	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,480	2	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,401	0.0	206	0	$26	$270	$0	10.3
CR 233	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 226	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 227	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 232	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 231	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 228	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 230	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
229 office	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
Vestibule 12	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Vestibule 12	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
200 hallway	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.1	310	0	$39	$225	$0	5.7
200 hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gym side hallway	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.1	379	0	$48	$450	$0	9.4
Gym side hallway	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 244	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
132 office	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
CR 235	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 235	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 236	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 236	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Electrical room	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
CR 237	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 237	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
237 storage	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
237 toilet	1	Incandescent: Screw-in 1 lamp	Wall Switch	S	60	3,480	1	Relamp	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	9	3,480	0.0	195	0	$25	$17	$1	0.7
CR 238	13	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	447	0	$57	$270	$35	4.2
CR 238	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
238 storage	1	Incandescent: Screw-in 2 lamp	Wall Switch	S	120	3,480	1	Relamp	No	1	LED Lamps: Screw-in 2 lamps	Wall Switch	18	3,480	0.1	390	0	$49	$34	$2	0.7
CR 239	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	413	0	$52	$270	$35	4.5
230 hallway	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.0	241	0	$30	$225	$0	7.4
CR 240	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 240	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
243 teachers lounge	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 241	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 241	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 242	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
240 hallway	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.0	206	0	$26	$225	$0	8.6
240 hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
246A room	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	69	0	$9	$116	$20	11.0
246D room	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	69	0	$9	$116	$20	11.0
246B room	3	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	S	176	3,480	1, 2	Relamp	Yes	3	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	2,401	0.3	1,332	0	$168	$445	$110	2.0
246A room	1	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	S	176	3,480	1	Relamp	No	1	LED - Linear Tubes: (6) 4' Lamps	Wall Switch	87	3,480	0.1	341	0	$43	$110	$30	1.8
246 Library	40	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	40	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.3	1,377	0	$174	$1,080	$140	5.4
246 Library	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
246 storage	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	69	0	$9	$116	$20	11.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Control office	2	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	S	176	3,480	1, 2	Relamp	Yes	2	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	2,401	0.2	888	0	$112	$335	$80	2.3
CR 223	16	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	551	0	$70	$270	$35	3.4
223 toilet	1	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	S	176	3,480	1	Relamp	No	1	LED - Linear Tubes: (6) 4' Lamps	Wall Switch	87	3,480	0.1	341	0	$43	$110	$30	1.8
Nurse's office	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	69	0	$9	$116	$20	11.0
Nurse's check room	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	138	0	$17	$116	$20	5.5
Nurse's restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
Custodian closet	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Main office storage	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	3,480	2	None	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,401	0.0	69	0	$9	$116	$0	13.3
Main office	13	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.1	671	0	$85	$270	$35	2.8
Main office kitchen	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,480	0.0	0	0	$0	$0	$0	0.0
Principal office	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,480	2	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,401	0.1	275	0	$35	$270	$35	6.8
Principal office restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
Conference room	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.0	206	0	$26	$116	$20	3.7
VP office	3	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.0	155	0	$20	$116	$20	4.9
VP office	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Office by the main hall	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.1	619	0	$78	$270	$35	3.0
Office by the main hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main lobby	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	10	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.1	344	0	$43	$450	$0	10.3
Main lobby	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Display case	2	LED Lamps: Screw-in 1 lamp - BR30	Wall Switch	S	12	3,480		None	No	2	LED Lamps: Screw-in 1 lamp - BR30	Wall Switch	12	3,480	0.0	0	0	$0	$0	$0	0.0
222 conference	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	413	0	$52	$270	$35	4.5
Room 221	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	275	0	$35	$270	$35	6.8
220 PT/OT	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	275	0	$35	$270	$35	6.8
220 hallway	18	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.1	619	0	$78	$675	$0	8.6
220 hallway	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

Location	Existing Conditions: Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	Proposed Conditions: ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Energy Impact & Financial Analysis: Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR 209	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.1	310	0	$39	$270	$35	6.0
CR 219	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	516	0	$65	$270	$35	3.6
CR 210	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.1	619	0	$78	$270	$35	3.0
CR 210	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
210 restroom	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,480	0.0	0	0	$0	$0	$0	0.0
CR 211	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.1	619	0	$78	$270	$35	3.0
CR 211	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 211 restroom	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,480	0.0	0	0	$0	$0	$0	0.0
Electrical room	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,480		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,480	0.0	0	0	$0	$0	$0	0.0
210 hallway	13	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	13	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.1	447	0	$57	$450	$0	8.0
210 hallway	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Book storage	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	69	0	$9	$116	$0	13.3
CR 212	13	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	447	0	$57	$270	$35	4.2
CR 212	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
212 storage	1	Incandescent: Screw-in 2 lamp	Wall Switch	S	120	3,480	1	Relamp	No	1	LED Lamps: Screw-in 2 lamps	Wall Switch	18	3,480	0.1	390	0	$49	$34	$2	0.7
CR 213	13	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	447	0	$57	$270	$35	4.2
CR 213	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
213 storage	1	Incandescent: Screw-in 2 lamp	Wall Switch	S	120	3,480	1	Relamp	No	1	LED Lamps: Screw-in 2 lamps	Wall Switch	18	3,480	0.1	390	0	$49	$34	$2	0.7
210 hallway	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.1	310	0	$39	$450	$0	11.5
CR 214	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 214	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 215	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 215	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 218	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 216	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR 216	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 217	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
210 hallway	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.0	241	0	$30	$225	$0	7.4
Gym	18	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,480	2	None	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,401	0.2	929	0	$117	$270	$35	2.0
Gym	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gym office	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	69	0	$9	$116	$20	11.0
Gym restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
Gym storage	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	138	0	$17	$116	$0	6.7
Mezzanine	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Front parking lot	2	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock		100	4,368		None	No	2	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	100	4,368	0.0	0	0	$0	$0	$0	0.0
Wallpacks	14	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		50	4,380		None	No	14	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	50	4,380	0.0	0	0	$0	$0	$0	0.0
Canopy mount	1	LED - Fixtures: Front door mount	Photocell		40	4,380		None	No	1	LED - Fixtures: Front door mount	Photocell	40	4,380	0.0	0	0	$0	$0	$0	0.0
Area light	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		40	4,380		None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	40	4,380	0.0	0	0	$0	$0	$0	0.0
Girls restroom	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	103	0	$13	$270	$0	20.7
Mechanical storage	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	103	0	$13	$116	$0	8.9
Custodian	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Men's staff room	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
Men's staff room	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,480		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,480	0.0	0	0	$0	$0	$0	0.0
Boys' restroom	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.0	103	0	$13	$270	$0	20.7
CR 201	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 208	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 202	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 207	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 203	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 206	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR 204	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
CR 205	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,401	0.1	310	0	$39	$270	$35	6.0
Vestibule 29	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,480	0.0	0	0	$0	$0	$0	0.0
Vestibule 29	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
200 hallway	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,480	3	None	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,401	0.1	275	0	$35	$225	$0	6.5
200 hallway	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
School driveway	3	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock		150	4,368		None	No	3	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	150	4,368	0.0	0	0	$0	$0	$0	0.0
School driveway	7	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock		300	4,368		None	No	7	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	300	4,368	0.0	0	0	$0	$0	$0	0.0
Board office - 1 conference room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.3	599	0	$76	$599	$125	6.3
Board office - Office 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.1	200	0	$25	$226	$50	7.0
Board office - Secretary office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,440	1, 2	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	994	0.2	333	0	$42	$453	$85	8.7
Board office - Secretary office	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Board office - Superintendent office	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.2	499	0	$63	$544	$110	6.9
Board office - Superintendent storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,440	0.0	78	0	$10	$55	$15	4.0
Board office - Director office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.1	299	0	$38	$280	$65	5.7
Board office - Storage in hall	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,440	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,440	0.0	52	0	$7	$37	$10	4.0
Board office - Storage 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,440	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,440	0.0	52	0	$7	$37	$10	4.0
Board office - Payroll office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,440	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	994	0.1	266	0	$34	$262	$60	6.0
Board office - Women restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	520	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	520	0.0	19	0	$2	$37	$10	11.1
Board office - Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	520	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	520	0.0	19	0	$2	$37	$10	11.1
Board office - Copy area	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	780	1, 2	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	538	0.1	108	0	$14	$226	$50	12.9
Board office - Kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	780	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	538	0.1	72	0	$9	$189	$40	16.4
Board office - Kitchen	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Board office - Office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.1	200	0	$25	$226	$50	7.0
Board office - Hallway	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,440	1, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	994	0.1	266	0	$34	$371	$40	9.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Board office - Hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Board office - Office 3	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.2	399	0	$50	$335	$80	5.1
Board office - Office 4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.1	200	0	$25	$226	$50	7.0
Board office - Office 5	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.1	200	0	$25	$226	$50	7.0
Board office - Open office area	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.1	299	0	$38	$280	$65	5.7
Board office - Open office hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.1	200	0	$25	$226	$50	7.0
Board office - Open office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,440	1, 2	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	994	0.1	200	0	$25	$335	$65	10.7
Board office - Open office 2	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Board office - Main lobby	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,440	1, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	994	0.1	200	0	$25	$335	$30	12.1
Board office - Exterior	4	Compact Fluorescent: Wall pack - Screw-in - 1 lamp	Photocell		92	4,380	1	Relamp	No	4	LED Lamps: Screw-in - 1 lamp	Photocell	64	4,380	0.1	484	0	$62	$69	$4	1.0
Board office - Wall pack	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		42	4,380		None	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	42	4,380	0.0	0	0	$0	$0	$0	0.0

Motor Inventory & Recommendations

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	P 1&2	2	Heating Hot Water Pump	5.0	89.5%	Yes	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler room	DHW Circulator	1	Water Supply Pump	0.1	60.0%	No	W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Classrooms	Unit ventilators	33	Supply Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Closet	Gym HV-C-1	1	Supply Fan	3.0	87.5%	No	W	4,200	4	No	89.5%	Yes	1	0.9	4,190	0	$539	$3,884	$240	6.8
Closet	AH-C-2 Media center	1	Supply Fan	3.0	87.5%	No	W	4,760	4	No	89.5%	Yes	1	0.9	4,749	0	$611	$3,884	$240	6.0
Roof	RTU-3 Café	1	Supply Fan	15.0	91.0%	No	W	3,300	4	No	92.4%	Yes	1	4.4	15,632	0	$2,010	$7,086	$1,200	2.9
Roof	RTU-3 Café	1	Exhaust Fan	10.0	89.5%	No	W	3,300	4	No	91.7%	Yes	1	3.1	10,760	0	$1,384	$5,375	$800	3.3
Roof	RTU-B1, D1	2	Supply Fan	3.0	87.5%	No	W	3,600	4	No	89.5%	Yes	2	1.8	7,184	0	$924	$7,625	$480	7.7
Roof	RTU-B1, D1	4	Supply Fan	0.8	60.0%	No	W	3,600		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-B1, D1	2	Exhaust Fan	0.8	60.0%	No	W	3,600	4	No	81.1%	Yes	2	0.7	3,697	0	$475	$5,759	$120	11.9
Roof	RTU-4 Café	1	Supply Fan	15.0	91.0%	No	W	3,300	4	No	92.4%	Yes	1	4.4	15,632	0	$2,010	$7,086	$1,200	2.9
Roof	RTU-4 Café	1	Exhaust Fan	10.0	89.5%	No	W	3,300	4	No	91.7%	Yes	1	3.1	10,760	0	$1,384	$5,375	$800	3.3
Roof	EF-2	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-C1	1	Supply Fan	3.0	87.5%	No	W	3,600	4	No	89.5%	Yes	1	0.9	3,592	0	$462	$3,812	$240	7.7
Roof	RTU-C1	2	Supply Fan	0.8	60.0%	No	W	3,600		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-C1	1	Exhaust Fan	0.8	60.0%	No	W	3,600	4	No	81.1%	Yes	1	0.3	1,848	0	$238	$2,880	$60	11.9
Roof	EF-4	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-6	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-3	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	All school	10	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Board office - Roof	Offices	6	Supply Fan	0.3	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
ERU-1	ERU-1	1	Supply Fan	3.0	87.5%	Yes	B	2,745		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
ERU-1	ERU-1	1	Exhaust Fan	2.0	86.5%	Yes	B	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
ERU-2	ERU-2	1	Supply Fan	3.0	87.5%	Yes	B	2,745		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
ERU-2	ERU-2	1	Exhaust Fan	2.0	86.5%	Yes	B	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
ERU-3	ERU-3	1	Supply Fan	3.0	87.5%	Yes	B	2,745		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
ERU-3	ERU-3	1	Exhaust Fan	2.0	86.5%	Yes	B	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
ERU-4	ERU-4	1	Supply Fan	3.0	87.5%	Yes	B	2,745		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
ERU-4	ERU-4	1	Exhaust Fan	2.0	86.5%	Yes	B	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
236 Music	236 Music	1	Window AC	0.67		B	5	Yes	1	Window AC	0.67		12.00		0.1	295	0	$38	$729	$0	19.2
Office	Office	1	Split-System AC	1.00		B	5	Yes	1	Split-System AC	1.00		14.00		0.1	297	0	$38	$1,496	$92	36.8
Roof	RTU - C-1 Café	1	Packaged AC	22.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Unknown	1	Packaged AC	10.00		B	5	Yes	1	Packaged AC	10.00		11.50		2.2	4,380	0	$563	$17,821	$730	30.3
Roof	RTU-3 Café	1	Packaged AC	20.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU - B1,D1	2	Packaged AC	10.00		N		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU-4 Café	1	Packaged AC	20.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU C-4	1	Packaged AC	5.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU C-3	1	Packaged AC	5.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU C-1	1	Packaged AC	7.67		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU C-1	1	Packaged AC	7.50		N		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU C-5 Room 221, 223	1	Packaged AC	7.67		W		No							0.0	0	0	$0	$0	$0	0.0
Board office - Roof	Offices - RTU 6,4,2,3	4	Packaged AC	3.00		B	5	Yes	4	Packaged AC	3.00		14.00		2.1	3,291	0	$423	$27,228	$1,104	61.7
Board office - Roof	Offices - RTU 6,4,2,3	4	Electric Forced Air Furnace		34.12	B		No							0.0	0	0	$0	$0	$0	0.0
Board office - Roof	Offices - RTU 5,1	2	Packaged AC	3.00		B	5	Yes	2	Packaged AC	3.00		14.00		1.0	1,646	0	$212	$13,614	$552	61.7
Board office - Roof	Offices - RTU 5,1	2	Electric Forced Air Furnace		34.12	B		No							0.0	0	0	$0	$0	$0	0.0
Board office - Electrical closet	Servers	1	Split-System AC	2.00		B	5	Yes	1	Split-System AC	2.00		14.00		0.3	406	0	$52	$2,992	$184	53.8

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Boilers	2	Condensing Hot Water Boiler	698.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	RTU-3 Café	1	Furnace	328.10	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	RTU - B1,D1	2	Furnace	192.00			No						0.0	0	0	$0	$0	$0	0.0
Roof	RTU-4 Café	1	Furnace	328.10	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	RTU C-1	1	Furnace	144.00			No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Restrooms and kitchen	1	Storage Tank Water Heater (> 50 Gal)	W	6	Yes	1	Storage Tank Water Heater (> 50 Gal)	Natural Gas	85.00%	Et	0.0	0	8	$87	$4,340	$150	48.3
Board office - Kitchen	Board office	1	Storage Tank Water Heater (≤ 50 Gal)	B		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	7	28	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	19	$196	$201	$0	1.0
Board office - Restrooms	7	3	Faucet Aerator (Lavatory)	2.20	0.50	0.0	584	0	$75	$22	$0	0.3

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)		No	No	No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Medium Temp Freezer (0F to 30F)		No	No	No	0.0	0	0	$0	$0	$0	0.0

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Refrigerator Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Freezer Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Convection Oven (Half Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Combination Oven/Steam Cooker (<15 Pans)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Griddle (≤2 Feet Width)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	4	Electric Steamer	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

Location	Existing Conditions			
	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Cecil SCES	127	Desktop Computer	145.0	Yes
Cecil SCES	15	Chrome book cart	40.0	Yes
Cecil SCES	6	Server	800.0	Yes
Cecil SCES	55	Printer - Small	60.0	Yes
Cecil SCES	5	Printer - Medium	90.0	Yes
Cecil SCES	4	Printer - Big	220.0	Yes
Cecil SCES	5	Paper shredder	200.0	Yes
Cecil SCES	34	Projector	400.0	Yes
Cecil SCES	10	Microwave Oven	900.0	Yes
Cecil SCES	10	Refrigerator - Small	80.0	Yes
Cecil SCES	1	Refrigerator - Medium	90.0	Yes
Cecil SCES	5	Refrigerator - Large	200.0	Yes
Cecil SCES	9	Coffee Machine	400.0	Yes
Cecil SCES	3	CRT DLP	120.0	Yes
Cecil SCES	4	LED TV	100.0	Yes
Cecil SCES	37	Smartboards	5.0	Yes
Cecil SCES	3	Table lamp	40.0	Yes
Barnegat Board Offices	20	Desktop Computer	140.0	Yes
Barnegat Board Offices	4	Laptop	60.0	Yes
Barnegat Board Offices	9	Printer - Small	60.0	Yes
Barnegat Board Offices	4	Printer - Medium	80.0	Yes
Barnegat Board Offices	3	Printer - Big	200.0	Yes
Barnegat Board Offices	2	Paper Shredder	250.0	Yes
Barnegat Board Offices	1	Microwave	900.0	Yes
Barnegat Board Offices	1	Refrigerator - Small	60.0	Yes
Barnegat Board Offices	1	Refrigerator - Large	200.0	Yes
Barnegat Board Offices	2	Coffee Machine	400.0	Yes
Barnegat Board Offices	1	Toaster	900.0	Yes
Barnegat Board Offices	1	Hot and Cold dispenser	520.0	Yes

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

LEARN MORE AT energystar.gov

ENERGY STAR® Statement of Energy Performance

69

ENERGY STAR® Score[1]

Cecil S Collins Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 91,429
Built: 1980

For Year Ending: January 31, 2019
Date Generated: July 31, 2019

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Cecil S Collins Elementary School 570 Barnegat Blvd North Barnegat, New Jersey 08005	Barnegat Township School District 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 (____)____-______	Stephen Brennan 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 609-698-5800 SBRENNAN@BARNEGATSCHOOLS.COI

Property ID: 7071508

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
54.7 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,476,627 (50%)
Electric - Grid (kBtu)	2,522,070 (50%)

Source EUI
105.7 kBtu/ft²

National Median Comparison	
National Median Site EUI (kBtu/ft²)	67
National Median Source EUI (kBtu/ft²)	129.5
% Diff from National Median Source EUI	-18%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	387

Signature & Stamp of Verifying Professional

I __________________ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: ________________________ Date: ____________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer Stamp
(if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gas* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.
gpf	*Gallons per flush*

gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp.
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units.
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp.
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp.
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge.
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense™	The symbol for water efficiency. The WaterSense™ program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.

Local Government Energy Audit Report

Barnegat Township High School

October 31, 2019

Prepared for:

Barnegat Township School District

180 Bengal Blvd

Barnegat, New Jersey 08005

Prepared by:

TRC

900 Route 9 North

Woodbridge, New Jersey 07095

Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC Companies Inc. (TRC) reviewed the energy conservation measures and estimates of energy savings were reviewed for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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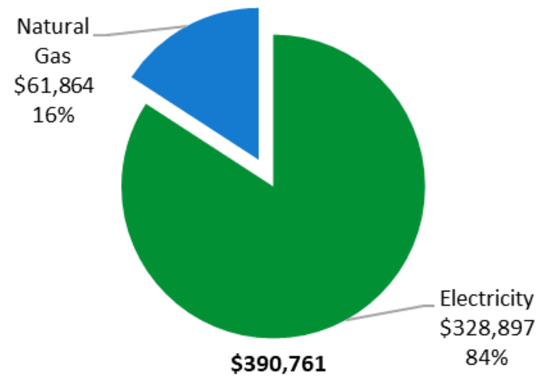
Table of Contents

1 Executive Summary

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Barnegat Township High School. This report provides you with information about the High School's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in the High School. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $390,761 Electricity: 2,913,860 kWh Natural Gas: 62,155 Therms	
ENERGY STAR® Benchmarking Score	21 *(1-100 scale)*	This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

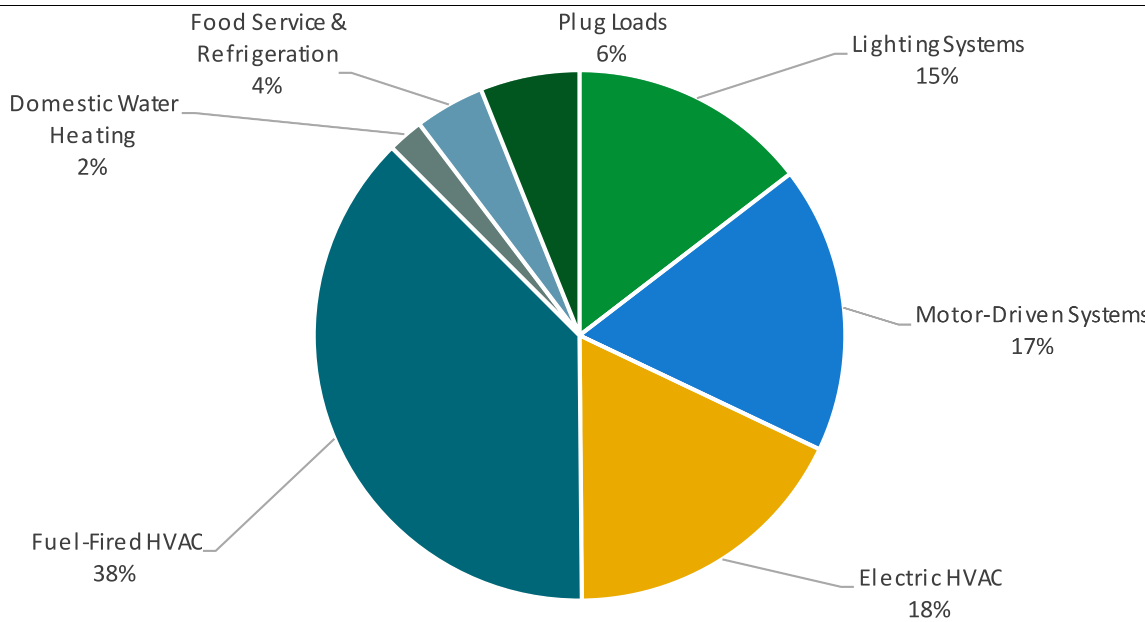


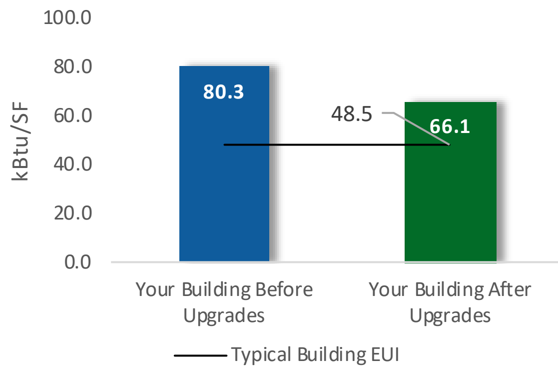
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

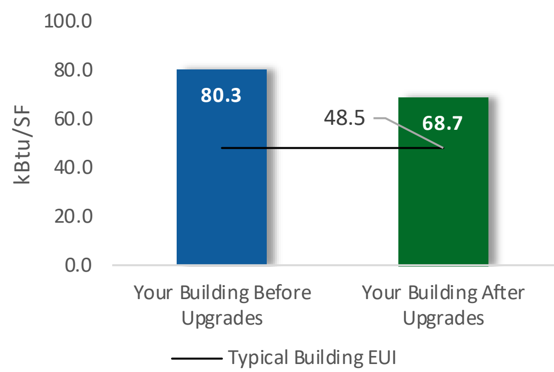
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$1,339,818
Potential Rebates & Incentives[1]	$128,560
Annual Cost Savings	$94,136
Annual Energy Savings	Electricity: 832,785 kWh Natural Gas: 137 Therms
Greenhouse Gas Emission Savings	420 Tons
Simple Payback	12.9 Years
Site Energy Savings (all utilities)	18%



Scenario 2: Cost Effective Package[2]

Installation Cost	$373,533
Potential Rebates & Incentives	$44,862
Annual Cost Savings	$77,600
Annual Energy Savings	Electricity: 688,581 kWh
Greenhouse Gas Emission Savings	346 Tons
Simple Payback	4.2 Years
Site Energy Savings (all utilities)	14%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	*Cost Effective?*	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**391,404**	**79.8**	**-68**	**$43,505**	**$207,670**	**$25,447**	**$182,223**	**4.2**	**386,216**
ECM 1	Install LED Fixtures	Yes	64,972	7.4	0	$7,334	$102,761	$600	$102,161	13.9	65,426
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	156	0.1	0	$17	$206	$30	$176	10.2	153
ECM 3	Retrofit Fixtures with LED Lamps	Yes	326,276	72.3	-68	$36,155	$104,702	$24,817	$79,885	2.2	320,637
Lighting Control Measures			**7,557**	**1.3**	**-2**	**$837**	**$3,822**	**$325**	**$3,497**	**4.2**	**7,425**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	7,557	1.3	-2	$837	$3,822	$325	$3,497	4.2	7,425
Motor Upgrades			**5,469**	**1.0**	**0**	**$617**	**$4,495**	**$0**	**$4,495**	**7.3**	**5,507**
ECM 5	Premium Efficiency Motors	Yes	5,469	1.0	0	$617	$4,495	$0	$4,495	7.3	5,507
Variable Frequency Drive (VFD) Measures			**276,092**	**66.7**	**0**	**$31,163**	**$156,251**	**$18,840**	**$137,411**	**4.4**	**278,023**
ECM 6	Install VFDs on Constant Volume (CV) Fans	Yes	246,205	57.4	0	$27,790	$134,561	$15,840	$118,721	4.3	247,926
ECM 7	Install VFDs on Chilled Water Pumps	Yes	29,888	9.3	0	$3,374	$21,690	$3,000	$18,690	5.5	30,097
Electric Unitary HVAC Measures			**3,595**	**1.6**	**0**	**$406**	**$21,978**	**$498**	**$21,480**	**52.9**	**3,620**
ECM 8	Install High Efficiency Air Conditioning Units	No	1,685	0.8	0	$190	$9,341	$69	$9,272	48.8	1,697
ECM 9	Install High Efficiency PTAC/PTHP	No	1,911	0.9	0	$216	$12,638	$429	$12,209	56.6	1,924
Electric Chiller Replacement			**140,608**	**90.6**	**0**	**$15,871**	**$932,906**	**$82,800**	**$850,106**	**53.6**	**141,591**
ECM 10	Install High Efficiency Chillers	No	140,608	90.6	0	$15,871	$932,906	$82,800	$850,106	53.6	141,591
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**26**	**$259**	**$11,401**	**$400**	**$11,001**	**42.5**	**3,047**
ECM 11	Install High Efficiency Furnaces	No	0	0.0	22	$220	$9,063	$400	$8,663	39.4	2,588
ECM 12	Install High Efficiency Unit Heaters	No	0	0.0	4	$39	$2,338	$0	$2,338	60.0	458
Domestic Water Heating Upgrade			**0**	**0.0**	**57**	**$567**	**$143**	**$0**	**$143**	**0.3**	**6,666**
ECM 13	Install Low-Flow DHW Devices	Yes	0	0.0	57	$567	$143	$0	$143	0.3	6,666
Food Service & Refrigeration Measures			**8,059**	**0.9**	**0**	**$910**	**$1,150**	**$250**	**$900**	**1.0**	**8,116**
ECM 14	Vending Machine Control	Yes	8,059	0.9	0	$910	$1,150	$250	$900	1.0	8,116
TOTALS (COST EFFECTIVE MEASURES)			**688,581**	**149.7**	**-12**	**$77,600**	**$373,533**	**$44,862**	**$328,671**	**4.2**	**691,953**
TOTALS (ALL MEASURES)			**832,785**	**241.9**	**14**	**$94,136**	**$1,339,818**	**$128,560**	**$1,211,258**	**12.9**	**840,211**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	x		x
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x		x
ECM 3	Retrofit Fixtures with LED Lamps	x		x
ECM 4	Install Occupancy Sensor Lighting Controls	x		x
ECM 5	Premium Efficiency Motors			x
ECM 6	Install VFDs on Constant Volume (CV) HVAC	x		x
ECM 7	Install VFDs on Chilled Water Pumps	x		x
ECM 8	Install High Efficiency Electric AC	x		x
ECM 9	Install High Efficiency Packaged Terminal AC/HP	x		x
ECM 10	Install High Efficiency Chillers	x		x
ECM 11	Install High Efficiency Furnaces	x		x
ECM 12	Install High Efficiency Unit Heaters	x		x
ECM 13	Install Low-Flow Domestic Hot Water Devices			x
ECM 14	Vending Machine Control			x

Figure 3 – Funding Options

New Jersey’s Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Barnegat Township High School. This report provides information on how the High School uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see **Appendix A: Equipment Inventory & Recommendations.**

2.1 Site Overview

On July 11, 2019, TRC performed an energy audit at Barnegat Township High School located in Barnegat, New Jersey. TRC met with Neil Piro to review the High School operations and help focus our investigation on specific energy-using systems.

Barnegat Township High School is a two-story, 201,214 square foot building built in 2004. Spaces include: classrooms, a gymnasium, an auditorium, offices, a cafeteria, corridors, stairwells, a commercial kitchen, and mechanical space. The High School has onsite generation and is 100% heated and cooled.

2.2 Building Occupancy

The High School is occupied from September through June. Typical weekday occupancy is approximately 100 staff and 992 students.

Building Name	Weekday/Weekend	Operating Schedule
Barnegat Township High School	Weekday	6:00 AM - 8:00 PM
	Weekend	Saturday: 6:00 AM - 8:00 PM Sunday: 9:00 AM - 9:00 PM (events only)

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a concrete block facade. The dividing walls are made of concrete masonry units. The roof is mainly flat with some portions curved. It is covered with black membrane and in good condition. Some pitched portions of the roof are made of metal cladding panels.

Most of the windows are double-glazed that have aluminum frames with a thermal break. The glass-to-frame seals are in good condition. Exterior doors have metal reinforced vinyl doors and are in good condition.

Facade

Exterior door

Windows

Roof

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. Several areas are illuminated with LED tubes, and T12 fluorescent lamps remain in service in the chiller room. Additionally, there are a significant number of 32-watt compact fluorescent lamps (CFL). Typically, T8 fluorescent lamps use electronic ballasts.

Fixture types include 2-, 3-, or 4-lamp, 2- or 4-foot long troffers, surface-mounted fixtures, and 2-foot fixtures with linear tube lamps. Most fixtures are controlled using wall switches. The gym, auxiliary gym, and wrestling weight room are lit using T5 high output 4-foot 4-lamp fixtures. Lighting in the wrestling weight room and auxiliary gym are controlled using wall switches while the main gym has remote-mounted occupancy sensors. Most fixtures are in good condition.

All exit signs are LED units. Interior lighting levels were generally sufficient.

The exterior fixtures consist mainly of 26- and 32-Watt 4-pin CFL fixtures and high intensity discharge (HID) wall pack and pole-mounted parking lot fixtures. A few LED wall-mounted fixtures are in use. The exterior fixtures are controlled using photocells or timeclocks.

T5 Gym Fixtures

CFL Wall-mounted Fixtures

Exterior Pole Fixtures

Linear T8 Fixtures

2.5 Air Handling Systems

Several air handling units with hot water and chilled water coils distribute conditioned air to most major areas throughout the school. Some of these are variable air volume system, and the rest are constant volume system. System supply fans range from 1.5 hp to 20 hp, and many systems include return fans. All of the units are original to the school and are at or beyond the end of their useful life.

Air Conditioners

The security office is cooled using a packaged terminal AC unit of 6.6-ton capacity and an EER of 9.5. The data room and the elevator room are cooled using split AC units of 3-ton and 0.75-ton capacities, respectively. These units have an average EER of 10.8. All units have passed their useful life and have been evaluated for replacement.

Air Handling Units

Air Handling Units

2.6 Heating Hot Water Systems

Two condensing Aerco hot water boilers with an output capacity of 1760 MBH and an efficiency of 88% provide space heating in the new addition section of the school via air handlers. These units were installed in the year 2007 and are in good condition. The hot water is circulated to the air handling units using two variable speed 3 hp hot water pumps.

The older section of the school has 16 operational individual modules of a 32 series boiler system. The auditor noted that the boiler is operating in non-condensing mode, with an output capacity of 335.16 and an efficiency of 84%. Hot water is distributed to the air handling units through two variable speed 20 hp hot water pumps. The boilers are original to the building and are approaching the end of their useful life. When these boilers are due for replacement, we suggest the facility representatives work with the design team to develop a design using fewer modular condensing boilers to improve efficiency, maintain redundancy, and part load operation, while reducing the number of units to maintain.

Currently, the system affords a lot of redundancy and a significant capacity for load adjustment. We recommend a more detailed evaluation of the boiler system to determine whether some relatively inexpensive system adjustments might afford some short-term savings while system replacement is under consideration.

There is a gas-fired furnace and a warm air unit heater in the GUH area with output capacities of 400 MBh and 80 MBh, respectively. These have been evaluated for replacement.

The space and loop temperatures in the school are controlled using an EMS.

Modular Boilers

Modular Boilers

VFD

Condensing Boilers – New Addition

2.7 Chilled Water Systems

There are four chillers serving most of the school's cooling load. The existing building is served by three air-cooled screw chillers of 250-ton cooling capacities. The new-addition of the school is cooled by an air-cooled scroll chiller with a 150-ton cooling capacity.

The chillers are configured in a primary distribution loop with two constant flow pumps (CWP 1, 2 – 25hp) and four variable flow secondary pumps (CHWP 3, 4 – 3 hp, and CHWP 6, 7 – 5 hp).

The chiller plant supplies chilled water to all the air handlers at the High School. The supply and space temperatures are controlled using an EMS.

All of the chillers have passed their useful life and have been evaluated for replacement.

Carrier - Chiller

Carrier - Chiller

Mammoth Chiller

Mammoth Chiller

2.8 Domestic Hot Water

One gas-fired water heater serves the High School's domestic hot water needs. The Rheem gas-fired unit has an input capacity of 715 MBh and a total tank capacity of 270 gallons with three tanks. It is approximately 80% efficient. The unit was installed in 2018 and is new and in good condition.

Hot water is distributed to the end uses using fractional horse power circulating pumps.

Hot Water Heater

2.9 Food Service and Refrigerator Equipment

The kitchen has a mix of gas and electric equipment including a gas convection oven, a steamer, and a griddle that are used to prepare meals for students. Most cooking is done using a convection gas-fired oven. Bulk prepared foods are held in several electric holding cabinets. Equipment is high-efficiency and in good condition.

The kitchen has several stand-up solid door refrigerators. There are also refrigerator and freezer chests. All equipment is standard efficiency and appears to be in good condition.

The walk-in refrigerator has an estimated 1.6-ton compressor and a single-fan evaporator. The walk-in medium temperature freezer has an approximately 2.5-ton compressor and a two-fan evaporator.

Warmer

Reach-in Refrigerator

Oven

Gas Burner

2.10 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 6% percent of total building energy use. This is higher than a typical building.

You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area, as well as Energy Efficient Best Practices.

There are approximately 435 computer work stations throughout the High School. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as Smart Boards, projectors, and fans. There are several residential-style refrigerators throughout the building that are used to store food for the staff. These vary in condition and efficiency.

There are five refrigerated beverage vending machines and four non-refrigerated vending machines. Vending machines are not equipped with occupancy-based controls.

Vending Machine

Vending Machine

2.11 Water-Using Systems

Faucet flow rates are at 1.5 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

2.12 On-Site Generation

Barnegat High School has a photovoltaic (PV) array that was installed in 2011. This system provides approximately 17% of the electricity used at the High School.

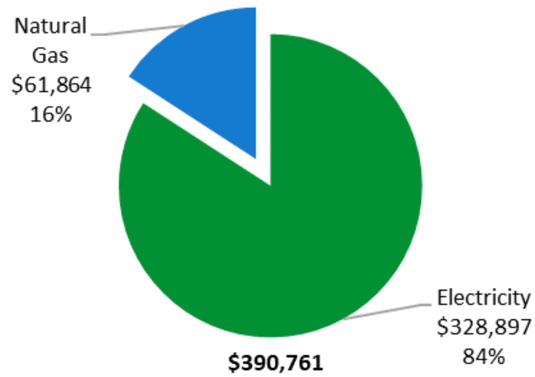
Solar PV

Solar PV

3 Energy Use and Costs

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	2,913,860 kWh	$328,897
Natural Gas	62,155 Therms	$61,864
Total		**$390,761**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

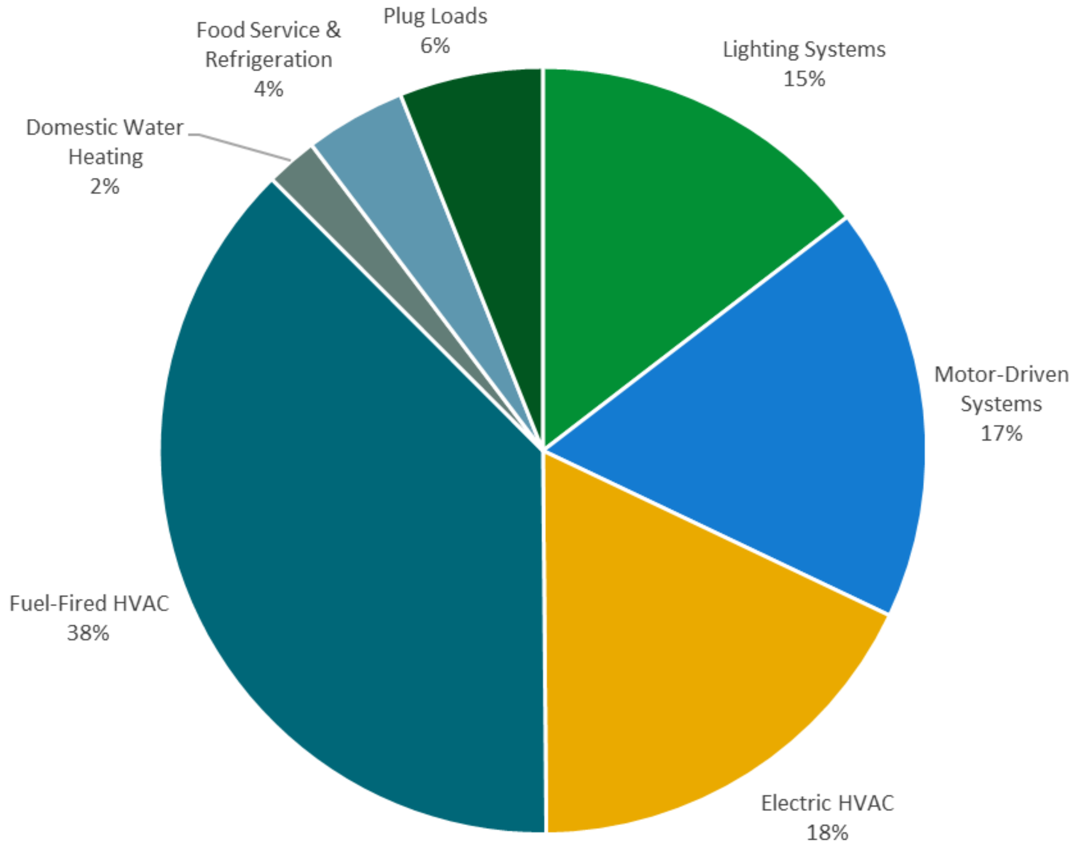
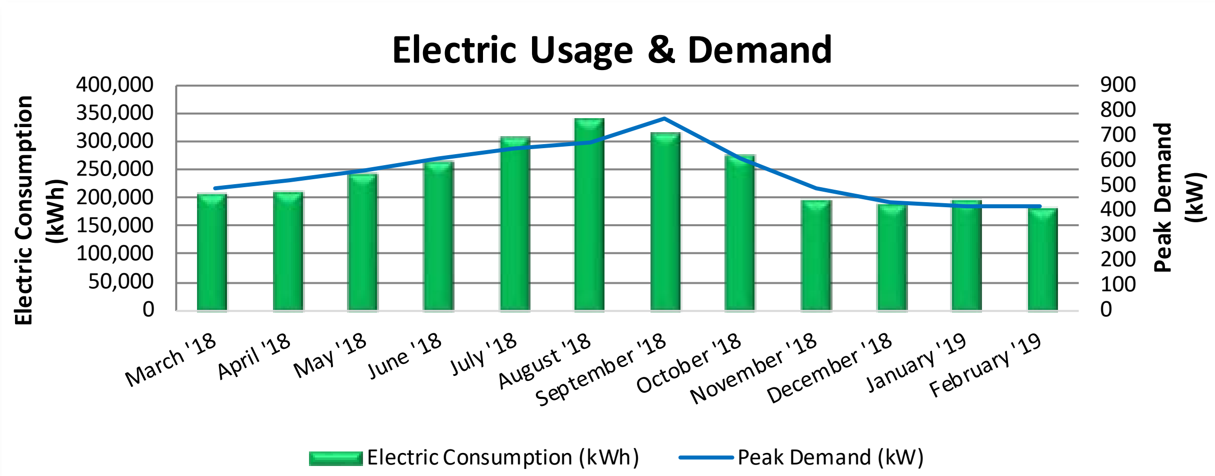


Figure 5 - Energy Balance

3.1 Electricity

JCP&L delivers electricity under rate class GSS, with electric production provided by South Jersey Energy/TriEagle Energy, a third-party supplier.



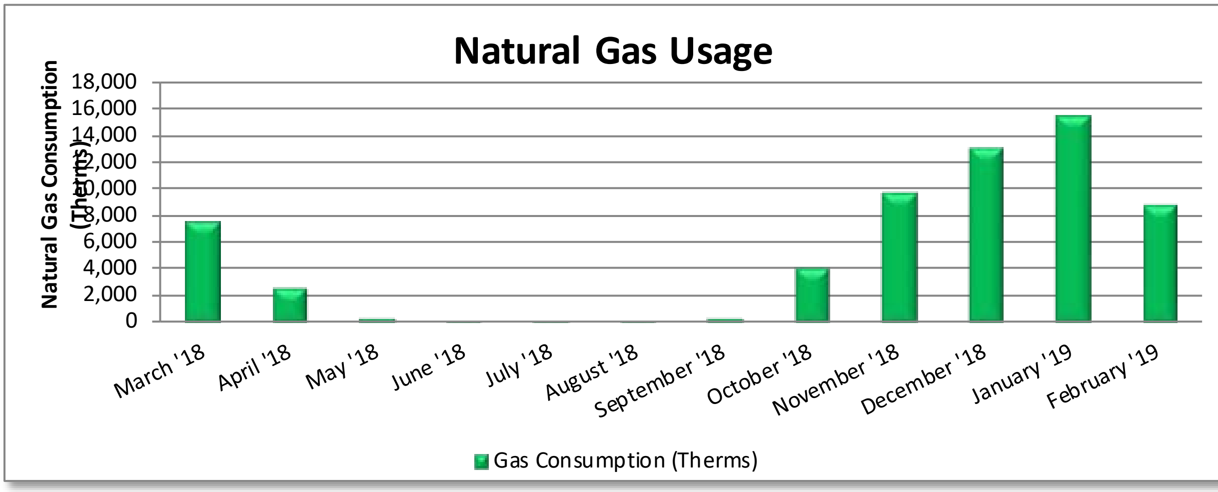
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
3/22/18	30	205,993	487	$3,213	$23,074
4/20/18	29	211,521	521	$3,323	$24,082
5/22/18	32	240,967	563	$3,531	$27,065
6/21/18	30	264,846	611	$4,109	$30,039
7/23/18	32	306,460	647	$4,352	$34,143
8/22/18	30	337,513	673	$4,527	$37,060
9/21/18	30	312,796	765	$5,146	$34,771
10/22/18	31	272,746	606	$3,802	$32,979
11/20/18	29	194,257	485	$3,043	$20,609
12/20/18	30	189,125	431	$2,700	$22,632
1/22/19	33	197,346	419	$2,628	$21,718
2/20/19	29	180,289	421	$2,637	$20,725
Totals	**365**	**2,913,860**	**765**	**$43,010**	**$328,897**
Annual	**365**	**2,913,860**	**765**	**$43,010**	**$328,897**

Notes:

- Peak demand of 765 kW occurred in September '18.
- The average electric cost over the past 12 months was $0.113/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

New Jersey Natural Gas delivers natural gas under rate class South Jersey Energy, with natural gas supply provided by GSL, a third-party supplier.



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
4/6/18	30	7,544	$6,438
5/3/18	27	2,551	$2,499
6/6/18	34	390	$862
7/6/18	30	224	$690
8/3/18	28	147	$632
8/29/18	26	152	$635
10/1/18	33	352	$876
11/2/18	32	4,181	$3,816
12/5/18	33	9,633	$8,002
1/5/19	31	12,962	$14,185
2/5/19	31	15,313	$14,962
3/7/19	30	8,707	$8,268
Totals	**365**	**62,155**	**$61,864**
Annual	**365**	**62,155**	**$61,864**

Notes:

- The average gas cost for the past 12 months is $0.995/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

Benchmarking Score	21

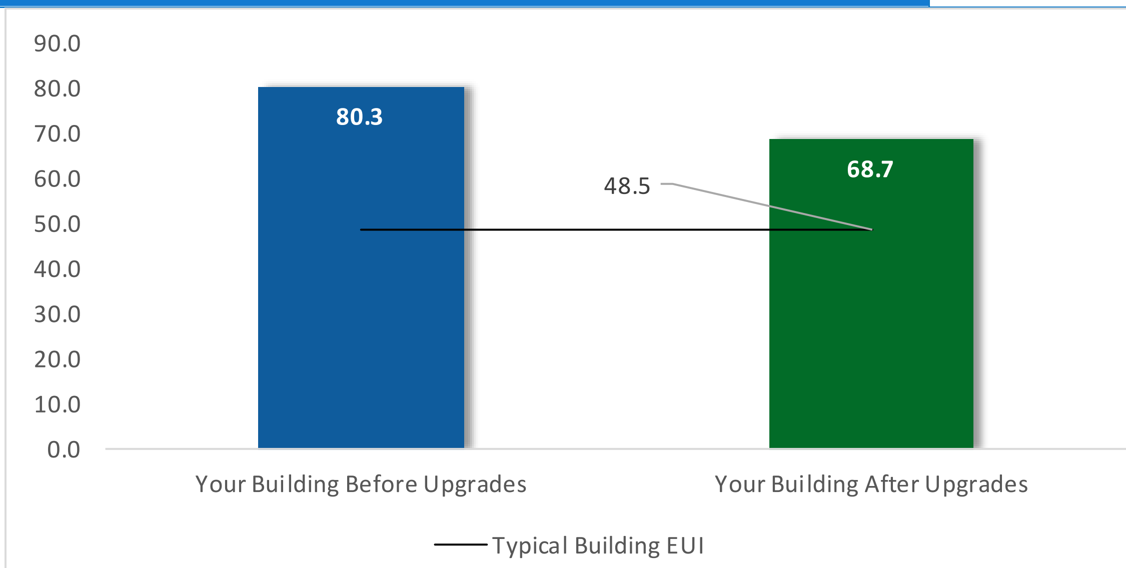


Figure 6 - Energy Use Intensity Comparison

This building performs at, or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause ~~as~~ building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**391,404**	**79.8**	**-68**	**$43,505**	**$207,670**	**$25,447**	**$182,223**	**4.2**	**386,216**
ECM 1	Install LED Fixtures	64,972	7.4	0	$7,334	$102,761	$600	$102,161	13.9	65,426
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	156	0.1	0	$17	$206	$30	$176	10.2	153
ECM 3	Retrofit Fixtures with LED Lamps	326,276	72.3	-68	$36,155	$104,702	$24,817	$79,885	2.2	320,637
Lighting Control Measures		**7,557**	**1.3**	**-2**	**$837**	**$3,822**	**$325**	**$3,497**	**4.2**	**7,425**
ECM 4	Install Occupancy Sensor Lighting Controls	7,557	1.3	-2	$837	$3,822	$325	$3,497	4.2	7,425
Motor Upgrades		**5,469**	**1.0**	**0**	**$617**	**$4,495**	**$0**	**$4,495**	**7.3**	**5,507**
ECM 5	Premium Efficiency Motors	5,469	1.0	0	$617	$4,495	$0	$4,495	7.3	5,507
Variable Frequency Drive (VFD) Measures		**276,092**	**66.7**	**0**	**$31,163**	**$156,251**	**$18,840**	**$137,411**	**4.4**	**278,023**
ECM 6	Install VFDs on Constant Volume (CV) Fans	246,205	57.4	0	$27,790	$134,561	$15,840	$118,721	4.3	247,926
ECM 7	Install VFDs on Chilled Water Pumps	29,888	9.3	0	$3,374	$21,690	$3,000	$18,690	5.5	30,097
Electric Unitary HVAC Measures		**3,595**	**1.6**	**0**	**$406**	**$21,978**	**$498**	**$21,480**	**52.9**	**3,620**
ECM 8	Install High Efficiency Air Conditioning Units	1,685	0.8	0	$190	$9,341	$69	$9,272	48.8	1,697
ECM 9	Install High Efficiency PTAC/PTHP	1,911	0.9	0	$216	$12,638	$429	$12,209	56.6	1,924
Electric Chiller Replacement		**140,608**	**90.6**	**0**	**$15,871**	**$932,906**	**$82,800**	**$850,106**	**53.6**	**141,591**
ECM 10	Install High Efficiency Chillers	140,608	90.6	0	$15,871	$932,906	$82,800	$850,106	53.6	141,591
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**26**	**$259**	**$11,401**	**$400**	**$11,001**	**42.5**	**3,047**
ECM 11	Install High Efficiency Furnaces	0	0.0	22	$220	$9,063	$400	$8,663	39.4	2,588
ECM 12	Install High Efficiency Unit Heaters	0	0.0	4	$39	$2,338	$0	$2,338	60.0	458
Domestic Water Heating Upgrade		**0**	**0.0**	**57**	**$567**	**$143**	**$0**	**$143**	**0.3**	**6,666**
ECM 13	Install Low-Flow DHW Devices	0	0.0	57	$567	$143	$0	$143	0.3	6,666
Food Service & Refrigeration Measures		**8,059**	**0.9**	**0**	**$910**	**$1,150**	**$250**	**$900**	**1.0**	**8,116**
ECM 14	Vending Machine Control	8,059	0.9	0	$910	$1,150	$250	$900	1.0	8,116
TOTALS		**832,785**	**241.9**	**14**	**$94,136**	**$1,339,818**	**$128,560**	**$1,211,258**	**12.9**	**840,211**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**391,404**	**79.8**	**-68**	**$43,505**	**$207,670**	**$25,447**	**$182,223**	**4.2**	**386,216**
ECM 1	Install LED Fixtures	64,972	7.4	0	$7,334	$102,761	$600	$102,161	13.9	65,426
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	156	0.1	0	$17	$206	$30	$176	10.2	153
ECM 3	Retrofit Fixtures with LED Lamps	326,276	72.3	-68	$36,155	$104,702	$24,817	$79,885	2.2	320,637
Lighting Control Measures		**7,557**	**1.3**	**-2**	**$837**	**$3,822**	**$325**	**$3,497**	**4.2**	**7,425**
ECM 4	Install Occupancy Sensor Lighting Controls	7,557	1.3	-2	$837	$3,822	$325	$3,497	4.2	7,425
Motor Upgrades		**5,469**	**1.0**	**0**	**$617**	**$4,495**	**$0**	**$4,495**	**7.3**	**5,507**
ECM 5	Premium Efficiency Motors	5,469	1.0	0	$617	$4,495	$0	$4,495	7.3	5,507
Variable Frequency Drive (VFD) Measures		**276,092**	**66.7**	**0**	**$31,163**	**$156,251**	**$18,840**	**$137,411**	**4.4**	**278,023**
ECM 6	Install VFDs on Constant Volume (CV) Fans	246,205	57.4	0	$27,790	$134,561	$15,840	$118,721	4.3	247,926
ECM 7	Install VFDs on Chilled Water Pumps	29,888	9.3	0	$3,374	$21,690	$3,000	$18,690	5.5	30,097
Domestic Water Heating Upgrade		**0**	**0.0**	**57**	**$567**	**$143**	**$0**	**$143**	**0.3**	**6,666**
ECM 13	Install Low-Flow DHW Devices	0	0.0	57	$567	$143	$0	$143	0.3	6,666
Food Service & Refrigeration Measures		**8,059**	**0.9**	**0**	**$910**	**$1,150**	**$250**	**$900**	**1.0**	**8,116**
ECM 14	Vending Machine Control	8,059	0.9	0	$910	$1,150	$250	$900	1.0	8,116
TOTALS		**688,581**	**149.7**	**-12**	**$77,600**	**$373,533**	**$44,862**	**$328,671**	**4.2**	**691,953**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**391,404**	**79.8**	**-68**	**$43,505**	**$207,670**	**$25,447**	**$182,223**	**4.2**	**386,216**
ECM 1	Install LED Fixtures	64,972	7.4	0	$7,334	$102,761	$600	$102,161	13.9	65,426
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	156	0.1	0	$17	$206	$30	$176	10.2	153
ECM 3	Retrofit Fixtures with LED Lamps	326,276	72.3	-68	$36,155	$104,702	$24,817	$79,885	2.2	320,637

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources is proposed, we suggest converting all fixtures of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the High School, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

Replace existing fixtures containing HID lamps with new LED light fixtures. This measure saves energy by installing LEDs, which use less power than other technologies with a comparable light output.

In some cases, HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixture(s).

Maintenance savings may also be achieved, as LED lamps last longer than other light sources and therefore do not need to be replaced as often.

Affected building areas: exterior fixtures.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Retrofit fluorescent fixtures by removing the fluorescent tubes and ballasts and replacing them with LED tubes and LED drivers (if necessary), which are designed to be used in retrofitted fluorescent fixtures.

The measure uses the existing fixture housing but replaces the electric components with more efficient lighting technology, which uses less power than other lighting technologies while providing equivalent lighting output. Maintenance savings may also be achieved, as LED tubes last longer than fluorescent tubes and therefore do not need to be replaced as often.

Affected building areas: all areas with fluorescent fixtures with T12 tubes.

ECM 3: Retrofit Fixtures with LED Lamps

Replace fluorescent or incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as direct replacements for most other lighting technologies.

This measure saves energy by installing LEDs, which use less power than other lighting technologies while providing equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes, CFL, or incandescent lamps.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**7,557**	**1.3**	**-2**	**$837**	**$3,822**	**$325**	**$3,497**	**4.2**	**7,425**
ECM 4	Install Occupancy Sensor Lighting Controls	7,557	1.3	-2	$837	$3,822	$325	$3,497	4.2	7,425

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 4: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote-mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected building areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms.

4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**5,469**	**1.0**	**0**	**$617**	**$4,495**	**$0**	**$4,495**	**7.3**	**5,507**
ECM 5	Premium Efficiency Motors	5,469	1.0	0	$617	$4,495	$0	$4,495	7.3	5,507

ECM 5: Premium Efficiency Motors

Replace standard efficiency motors with IHP 2014 efficiency motors. This evaluation assumes that existing motors will be replaced with motors of equivalent size and type. In some cases, additional savings may be possible by downsizing motors to better meet the motor's current load requirements.

Affected motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Upper boiler room	HWP-1	1	Heating Hot Water Pump	20.0	
Upper boiler room	HWP-2	1	Heating Hot Water Pump	20.0	

Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours. The base case motor energy consumption is estimated using the efficiencies found on nameplates or estimated based on the age of the motor and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the current *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*.

4.4 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**276,092**	**66.7**	**0**	**$31,163**	**$156,251**	**$18,840**	**$137,411**	**4.4**	**278,023**
ECM 6	Install VFDs on Constant Volume (CV) Fans	246,205	57.4	0	$27,790	$134,561	$15,840	$118,721	4.3	247,926
ECM 7	Install VFDs on Chilled Water Pumps	29,888	9.3	0	$3,374	$21,690	$3,000	$18,690	5.5	30,097

Variable frequency drives (VFDs) control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor to conservatively account for the cost of an inverter duty rated motor.

Premium efficiency motors have been proposed to be installed only in conjunction with proposed VFDs motor measures. Non-inverter duty rated motors will need to be replaced when the VFD measure is implemented.

ECM 6: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone while maintaining a constant supply air temperature.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: AHU 1-17.

ECM 7: Install VFDs on Chilled Water Pumps

Install VFDs to control chilled water pumps. Two-way valves must serve the chilled water coils being served and the chilled water loop must have a differential pressure sensor installed. If three-way valves or a bypass leg are used in the chilled water distribution, they will need to be modified when this measure is implemented. As the chilled water valves close, the differential pressure increases, and the VFD modulates the pump speed to maintain a differential pressure setpoint.

For systems with variable chilled water flow through the chiller, the minimum flow to prevent the chiller from tripping off will need to be determined during the final project design. The control system should be programmed to maintain the minimum flow through the chiller and to prevent pump cavitation.

Energy savings result from reducing the pump motor speed (and power) as chilled water valves close. The magnitude of energy savings is based on the estimated amount of time that the system operates at reduced loads.

Affected pumps: two 25hp chilled water pumps

4.5 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**3,595**	**1.6**	**0**	**$406**	**$21,978**	**$498**	**$21,480**	**52.9**	**3,620**
ECM 8	Install High Efficiency Air Conditioning Units	1,685	0.8	0	$190	$9,341	$69	$9,272	48.8	1,697
ECM 9	Install High Efficiency PTAC/PTHP	1,911	0.9	0	$216	$12,638	$429	$12,209	56.6	1,924

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units at the High School are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high-efficiency unit can be justified by the marginal savings from the improved efficiency. When the split AC and the PTAC units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 8: Install High-Efficiency Air Conditioning Units

Replace standard efficiency packaged air conditioning units with high-efficiency packaged air conditioning units. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high-efficiency unit, average cooling load, and estimated annual operating hours.

ECM 9: Install High-Efficiency PTAC/PTHP

Replace packaged terminal air conditioners and heat pumps (PTAC and PTHP) with high-efficiency units. A higher EER or SEER rating indicates a more efficient cooling system and a higher HSPF rating indicates more efficient heating mode. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high-efficiency unit, average heating and cooling loads, and estimated annual operating hours.

4.6 Electric Chillers

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Chiller Replacement		**140,608**	**90.6**	**0**	**$15,871**	**$932,906**	**$82,800**	**$850,106**	**53.6**	**141,591**
ECM 10	Install High Efficiency Chillers	140,608	90.6	0	$15,871	$932,906	$82,800	$850,106	53.6	141,591

ECM 10: Install High-Efficiency Chillers

Replace older inefficient electric chillers with new high-efficiency chillers. The type of chiller to be installed depends on the magnitude of the cooling load and variability of the cooling load profile, for example:

- Positive displacement chillers are usually under 600 tons of cooling capacity and centrifugal chillers generally start at 150 tons of cooling capacity.
- Constant speed chillers should be used to meet cooling loads with little or no variation while variable speed chillers are more efficient for variable cooling load profiles.
- Water cooled chillers are more efficient than air cooled chillers but require cooling towers and additional pumps to circulate the cooling water.
- In any given size range, variable speed chillers tend to have better partial load efficiency, but lower full load efficiency, than constant speed chillers.

Energy savings result from the improvement in chiller efficiency and matching the right type of chiller to the cooling load. The energy savings are calculated based on the cooling capacity of the new chiller, improvement in efficiency compared with the base case equipment, cooling load profile, and estimated annual operating hours of the chiller before and after the upgrade.

For the purposes of this analysis, we evaluated the replacement of chillers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your design team to select chillers that are sized appropriately for the cooling load at the High School. In some cases, the plant energy use can be reduced by selecting multiple chillers that match the facility load profile rather than one or two large chillers. This can also improve the chiller plant reliability through increased redundancy. Energy savings are maximized by proper selection of new equipment based on the cooling load profile.

Replacing the chiller has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the chiller has reached the end of its normal useful life. Typically, the marginal cost of purchasing a high-efficiency chiller can be justified by the marginal savings from the improved efficiency. When the chillers are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

4.7 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**26**	**$259**	**$11,401**	**$400**	**$11,001**	**42.5**	**3,047**
ECM 11	Install High Efficiency Furnaces	0	0.0	22	$220	$9,063	$400	$8,663	39.4	2,588
ECM 12	Install High Efficiency Unit Heaters	0	0.0	4	$39	$2,338	$0	$2,338	60.0	458

ECM 11: Install High-Efficiency Furnaces

Replace standard efficiency furnaces with condensing furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases, which can significantly improve furnace efficiency. Savings result from improved system efficiency.

Note: These units produce acidic condensate that requires proper drainage.

ECM 12: Install High-Efficiency Unit Heaters

Replace existing standard gas-fired unit heaters with high-efficiency gas-fired unit heaters. Improved combustion technology and heat exchanger design optimize the heat recovery from the combustion gases, which can significantly improve unit heater efficiency. Savings result from improved system efficiency.

Note: These units produce acidic condensate that requires proper drainage.

4.8 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**57**	**$567**	**$143**	**$0**	**$143**	**0.3**	**6,666**
ECM 13	Install Low-Flow DHW Devices	0	0.0	57	$567	$143	$0	$143	0.3	6,666

ECM 13: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low-flow devices are recommended to reduce hot water usage:

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

Low-flow devices reduce the overall water flow from the fixture while still providing adequate pressure for washing. Additional cost savings may result from reduced water usage.

4.9 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**8,059**	**0.9**	**0**	**$910**	**$1,150**	**$250**	**$900**	**1.0**	**8,116**
ECM 14	Vending Machine Control	8,059	0.9	0	$910	$1,150	$250	$900	1.0	8,116

ECM 14: Vending Machine Control

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time, and power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[4]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

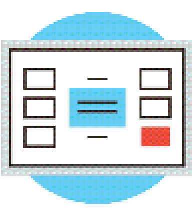
Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly.

Motor Short Cycling Reduction

Frequent stopping and starting of motors places substantial stress on rotors and other parts. This leads to wear and tear, lower efficiency, and higher maintenance costs. Adjust the load on the motor to limit the amount of unnecessary stopping and starting to improve motor performance.

Thermostat Schedules and Temperature Resets



Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the High School's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan, and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

Furnace Maintenance

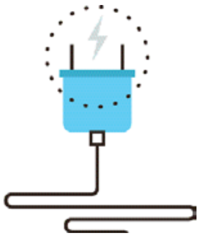
Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should: check for gas / carbon monoxide leaks; change the air and fuel filters; check components for cracks, corrosion, dirt, or debris build-up; ensure the ignition system is working properly; test and adjust operation and safety controls; inspect electrical connections; and lubricate motors and bearings.

Water Heater Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense™ website[6] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the High School is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense™ products where available.

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[5] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

[6] https://www.epa.gov/watersense

[7] https://www.epa.gov/watersense/watersense-work-0

6 ON-SITE GENERATION

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the High School's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for the High School. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

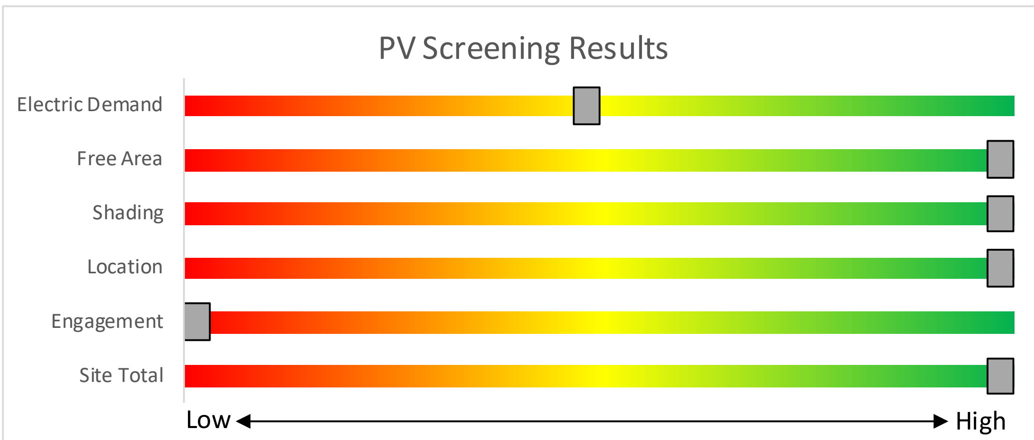
6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the High School's electric demand, size and location of free area, and shading elements shows that the High School has **high** potential for installing additional PV arrays.

The amount of free area, ease of installation, and the lack of shading elements contribute to the high potential. A PV array located on the roof may be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	High	
System Potential	358	kW DC STC
Electric Generation	426,510	kWh/yr
Displaced Cost	$48,140	/yr
Installed Cost	$930,800	

Figure 9 - Photovoltaic Screening

Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

- **Basic Info on Solar PV in New Jersey**: www.njcleanenergy.com/whysolar
- **New Jersey Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the New Jersey Market**: www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

6.2 Combined Heat and Power

Combined heat and power (CHP) generate electricity at the High School and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

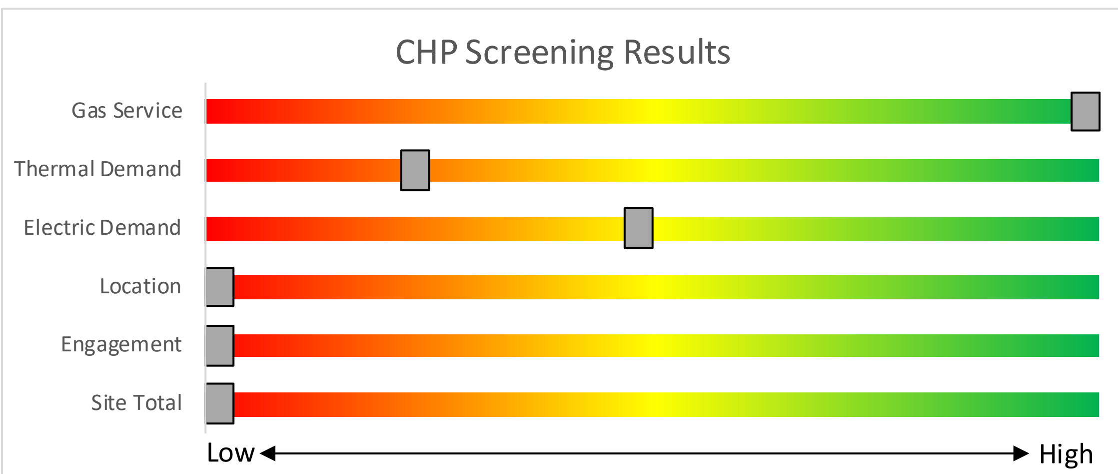
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the High School has **no** potential for installing a cost-effective CHP system.

Low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	None	
System Type	None	
System Potential	300	kW
Electric Generation	633,070	kWh/yr
Thermal Generation	3,056,977	MBtu/yr
Displaced Cost	$35,403	/yr
Installed Cost	$863,000	

Figure 10 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: [http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.](http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/)

7 Project Funding and Incentives

Ready to improve your building's performance? Pick the program that works best for you. Incentive programs that may apply to the High School are identified in the Executive Summary. This section provides an overview of currently available New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at the High School. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficient equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at the High School, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where the High School is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

Incentives

Incentives are based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

Contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan, assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine Fuel Cells with Heat Recovery	>3 MW	$350		
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at: [www.njcleanenergy.com/CHP.](www.njcleanenergy.com/CHP)

7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the energy savings plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.6 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: www.njcleanenergy.com/srec.

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for the High School's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[8].

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier typically depends on whether a customer prefers budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

[8] www.state.nj.us/bpu/commercial/shopping.html

[9] www.state.nj.us/bpu/commercial/shopping.html

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Big chiller	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	800	2	Relamp & Reballast	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.1	156	0	$17	$206	$30	10.2
Boiler room	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.4	465	0	$51	$584	$160	8.2
Elevator	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	4,400	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	None	29	4,400	0.1	479	0	$53	$110	$30	1.5
S16 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.0	29	0	$3	$73	$20	16.5
C202 Science lab	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,314	0	$256	$767	$210	2.2
Science prep	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
C204 Science room	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,314	0	$256	$767	$210	2.2
CR C203	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C206	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C205	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C207	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C208	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
S17 Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.1	58	0	$6	$146	$40	16.5
CR C209	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
M5 Mech Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.2	232	0	$26	$292	$80	8.2
Men 2nd floor	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
Janitor closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	29	0	$3	$37	$10	8.2
Staff restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,036	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,036	0.0	53	0	$6	$33	$6	4.5
CR C209	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
Women 2nd floor	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
C hall 2nd floor	14	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	14	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.1	449	0	$50	$353	$14	6.8
C hall 2nd floor	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
C hall 2nd floor	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
C hall 2nd floor	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
C hall 2nd floor	1	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	32	0	$4	$25	$1	6.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR C201	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C210	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
C hall 2nd floor	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
C hall 2nd floor	1	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	32	0	$4	$25	$1	6.8
C hall 2nd floor	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR B201	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR B202	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	800	3, 4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	552	0.1	166	0	$18	$280	$45	12.8
Women 2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Staff restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,400	0.0	77	0	$9	$33	$6	3.1
JC 4 Janitor closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	800	0.0	14	0	$2	$33	$6	17.0
Men 2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
CR B203	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR B204	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR B205	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR B207	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR B208	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR B209	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR B210 Physics	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,480	-1	$275	$822	$225	2.2
CR B206	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
B210 Prep	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	610	0	$68	$226	$50	2.6
B212 Physics	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,480	-1	$275	$822	$225	2.2
B213 Chemistry	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,480	-1	$275	$822	$225	2.2
B 211A Prep	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	610	0	$68	$226	$50	2.6
B211 Chemistry	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,480	-1	$275	$822	$225	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
B hall 2nd floor	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
B hall 2nd floor	19	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	19	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.1	609	0	$67	$480	$19	6.8
B hall 2nd floor	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
B hall 2nd floor	1	LED Lamps: (2) 5W Plug-In Lamps	High/Low Control	S	10	3,036		None	No	1	LED Lamps: (2) 5W Plug-In Lamps	High/Low Control	10	3,036	0.0	0	0	$0	$0	$0	0.0
CR A214	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
Data Room 5	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	110	0	$12	$37	$10	2.2
EC-2 Electric closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.0	29	0	$3	$73	$20	16.5
CR A211	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A212	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A213	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A214	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A208	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
S15 storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	800	3, 4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	552	0.1	166	0	$18	$280	$45	12.8
CR A209	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A207	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A205A	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
CR A205	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
Girls 2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Girls 2nd floor	1	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	32	0	$4	$25	$1	6.8
Staff restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,400	0.0	77	0	$9	$33	$6	3.1
JC3 closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.0	15	0	$2	$37	$10	16.5
CR A203	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
Boys 2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Boys 2nd floor	1	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	32	0	$4	$25	$1	6.8
CR A204	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	661	0	$73	$219	$60	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR A201	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,488	0	$165	$493	$135	2.2
CR A202	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	661	0	$73	$219	$60	2.2
CR A200 Teachers lounge	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.2	992	0	$110	$329	$90	2.2
S11 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	400	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	400	0.1	44	0	$5	$110	$30	16.5
A Hall 2nd floor	19	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	19	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
A Hall 2nd floor	15	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	15	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.1	481	0	$53	$379	$15	6.8
A Hall 2nd floor	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR C101	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C102 Science lab	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,314	0	$256	$767	$210	2.2
Science prep	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
CR C104	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,314	0	$256	$767	$210	2.2
CR C103	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C106	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C105	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C107	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR C108	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
S14 Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.1	58	0	$6	$146	$40	16.5
M4 Mech room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.2	261	0	$29	$329	$90	8.2
CR C109	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
Men 1st floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	331	0	$37	$110	$30	2.2
Men 1st floor	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8
Janitor closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.0	15	0	$2	$37	$10	16.5
Toilet staff	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,036	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,036	0.0	53	0	$6	$33	$6	4.5
Women 1st floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	331	0	$37	$110	$30	2.2
Women 1st floor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	220	0	$24	$73	$20	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Women 1st floor	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8
CR C109A	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
CR C110	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
8 Vestibule	1	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	32	4,400	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Wall Switch	22	4,400	0.0	46	0	$5	$25	$1	4.7
C Hall 1st floor	26	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	26	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
C Hall 1st floor	15	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	15	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.1	481	0	$53	$379	$15	6.8
C Hall 1st floor	7	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	7	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
6 Vestibule	1	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	32	4,400	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Wall Switch	22	4,400	0.0	46	0	$5	$25	$1	4.7
TWR 1 Lounge	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,488	0	$165	$493	$135	2.2
TWR 1 Lounge	3	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	3	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	96	0	$11	$76	$3	6.8
CR B101	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
CR B101A	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
Women 1st floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Women 1st floor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	220	0	$24	$73	$20	2.2
Women 1st floor	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8
CR B102	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
Staff toilet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,400	0.0	77	0	$9	$33	$6	3.1
JC2 closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	800	0.0	14	0	$2	$33	$6	17.0
Men 1st floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Men 1st floor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	220	0	$24	$73	$20	2.2
Men 1st floor	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8
CR B104	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR B103 Computer lab	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.7	3,086	-1	$342	$1,022	$280	2.2
B106 studio	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.7	3,306	-1	$366	$1,095	$300	2.2
B106 office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
B106 Dark room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	661	0	$73	$219	$60	2.2
CR C105	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.6	2,645	-1	$293	$876	$240	2.2
B107 Biology	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,480	-1	$275	$822	$225	2.2
B107 Biology	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
B107A Prep room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
B109 Biology	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,480	-1	$275	$822	$225	2.2
B109 Biology	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
B108 Tech room	34	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	34	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.8	3,747	-1	$415	$1,242	$340	2.2
B108 A office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
B110 class	34	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	34	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.8	3,747	-1	$415	$1,242	$340	2.2
B hall 1st floor	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
B hall 1st floor	20	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	20	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.1	641	0	$71	$505	$20	6.8
B hall 1st floor	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR A112	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	3,036		None	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	0	0	$0	$0	$0	0.0
Elevator Machine room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	29	0	$3	$37	$10	8.2
EC 1 Elec closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	29	0	$3	$37	$10	8.2
Data room 4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,400	0.0	160	0	$18	$37	$10	1.5
CR A101	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A108	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A109	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A111	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A106	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A107	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
CR A105	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
Data room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,400	0.0	160	0	$18	$37	$10	1.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Women 1st floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Women 1st floor	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8
CR A103A	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.6	2,645	-1	$293	$876	$240	2.2
Men 1st floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Men 1st floor	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8
JC 1 closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	29	0	$3	$37	$10	8.2
Staff restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,400	0.0	77	0	$9	$33	$6	3.1
S3 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	400	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	400	0.1	44	0	$5	$110	$30	16.5
A101 Art room	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.6	2,645	-1	$293	$876	$240	2.2
S1 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	400	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	400	0.1	44	0	$5	$110	$30	16.5
A101B Kiln	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,400	0.0	319	0	$35	$73	$20	1.5
A102 Art	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.7	3,086	-1	$342	$1,022	$280	2.2
S2 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	400	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	400	0.1	44	0	$5	$110	$30	16.5
A hall 1st floor	20	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	20	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
A hall 1st floor	18	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	18	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.1	577	0	$64	$454	$18	6.8
A hall 1st floor	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairwell 5	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	High/Low Control	S	62	3,036	3	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.2	771	0	$85	$256	$70	2.2
Stairwell 5	2	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	2	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	64	0	$7	$50	$2	6.8
Stairwell 5	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stair North	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	High/Low Control	S	62	3,036	3	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.2	771	0	$85	$256	$70	2.2
Stair North	2	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	2	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	64	0	$7	$50	$2	6.8
Stair North	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stair South	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	High/Low Control	S	62	3,036	3	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.2	771	0	$85	$256	$70	2.2
Stair South	2	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	2	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	64	0	$7	$50	$2	6.8
Stair South	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Stairwell 4	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	High/Low Control	S	62	3,036	3	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.2	771	0	$85	$256	$70	2.2
Stairwell 4	2	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	2	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	64	0	$7	$50	$2	6.8
Stairwell 4	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
West stair	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	High/Low Control	S	62	3,036	3	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.2	771	0	$85	$256	$70	2.2
West stair	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Wrestling weight room	20	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	S	120	4,400	3, 4	Relamp	Yes	20	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,036	1.2	7,742	-2	$858	$2,001	$470	1.8
Wrestling weight room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
S6 storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	552	0.1	148	0	$16	$262	$40	13.6
Auxillary Gym	24	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	S	120	4,400	3, 4	Relamp	Yes	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,036	1.4	9,290	-2	$1,029	$2,293	$550	1.7
Auxillary Gym	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
S13 storage	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	552	0.4	443	0	$49	$708	$120	12.0
Aux gym hall	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
Aux gym hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Electrical room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.1	116	0	$13	$146	$40	8.2
Data room 3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,400	0.0	160	0	$18	$37	$10	1.5
Upstairs boiler room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	58	0	$6	$73	$20	8.2
Hallway I2	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
Hallway I2	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Faculty dining	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.5	2,314	0	$256	$767	$210	2.2
Faculty dining bathroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,036	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,036	0.0	53	0	$6	$33	$6	4.5
Hall by faculty room	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
JC7 closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	29	0	$3	$37	$10	8.2
Women 1st floor	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	3,036		None	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	0	0	$0	$0	$0	0.0
Women 1st floor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	661	0	$73	$219	$60	2.2
Women 1st floor	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8

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Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Men 1st floor	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	3,036		None	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	0	0	$0	$0	$0	0.0
Men 1st floor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	661	0	$73	$219	$60	2.2
Men 1st floor	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8
Cafeteria	176	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	176	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
Cafeteria	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
JC6 closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	58	0	$6	$73	$20	8.2
S4 storage	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	800		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	800	0.0	0	0	$0	$0	$0	0.0
Store room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	800	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	800	0.1	87	0	$10	$110	$30	8.2
Serving area	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
Kitchen	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	11	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.4	2,635	-1	$292	$602	$165	1.5
Kitchen storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	400	0.0	22	0	$2	$55	$15	16.5
Kitchen restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	165	0	$18	$55	$15	2.2
Kitchen office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.0	240	0	$27	$55	$15	1.5
Can room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.0	240	0	$27	$55	$15	1.5
Kitchen	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	661	0	$73	$219	$60	2.2
Maintenance room	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
Maintenance room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Maintenance storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	400	0.0	22	0	$2	$55	$15	16.5
Custodian lounge	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
Custodian restroom	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
Maintenance room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,400	0.0	160	0	$18	$37	$10	1.5
Cafeteria hall	14	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	14	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
Cafeteria hall	6	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	6	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	192	0	$21	$151	$6	6.8
Cafeteria hall	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Guidance office	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,488	0	$165	$493	$135	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Guidance 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Guidance 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Guidance 4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Guidance 5	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Guidance pantry	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	3,036		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	0	0	$0	$0	$0	0.0
Guidance conference room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	661	0	$73	$219	$60	2.2
Guidance office room	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	3,036		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	0	0	$0	$0	$0	0.0
Guidance meeting room	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	3,036		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	0	0	$0	$0	$0	0.0
Athletic director	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Athletic director	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	661	0	$73	$219	$60	2.2
Nurse's office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.2	992	0	$110	$329	$90	2.2
Weight room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	165	0	$18	$55	$15	2.2
Weight room restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.0	240	0	$27	$55	$15	1.5
Weight records	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	165	0	$18	$55	$15	2.2
Boys locker room	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3, 4	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.8	5,182	-1	$574	$1,201	$290	1.6
Boys locker room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
BLR restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	610	0	$68	$226	$30	2.9
BLR restroom	2	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	32	4,400	3, 4	Relamp	Yes	2	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	160	0	$18	$166	$2	9.3
BLR restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.2	1,016	0	$113	$453	$50	3.6
Coach Boys office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Coach office shower	3	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	32	4,400	3, 4	Relamp	Yes	3	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	240	0	$27	$192	$23	6.3
Coach girls office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Coach office shower	3	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	32	4,400	3, 4	Relamp	Yes	3	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	240	0	$27	$192	$23	6.3
Girls locker room	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.6	2,810	-1	$311	$931	$255	2.2
GLR restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
GLR restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	551	0	$61	$183	$50	2.2
GLR restroom	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	1	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	32	0	$4	$25	$1	6.8
GLR	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
PE Hallway	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	High/Low Control	S	93	3,036	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	3,036	0.1	661	0	$73	$219	$60	2.2
PE Hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main Gym	43	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Occupancy Sensor	S	120	3,036	3	Relamp	No	43	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,036	1.9	8,903	-2	$986	$3,140	$860	2.3
Main Gym	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Weight room	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3, 4	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.9	6,097	-1	$675	$1,635	$370	1.9
Weight room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
WR Coach office	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	High/Low Control	S	93	3,036	3	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	3,036	0.2	1,157	0	$128	$383	$105	2.2
WR Coach office	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
WR Coach restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,400	0.0	77	0	$9	$33	$6	3.1
Main Gym Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	813	0	$90	$262	$40	2.5
Hall by nurse office	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
Hall by nurse office	4	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	4	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	128	0	$14	$101	$4	6.8
Hall by nurse office	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
E105 theatre	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.4	1,984	0	$220	$657	$180	2.2
E105 theatre	5	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	5	LED Lamps: 4 pin - 1 lamps	Occupancy Sensor	22	3,036	0.0	160	0	$18	$126	$5	6.8
S7 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.0	29	0	$3	$73	$20	16.5
Back stage work room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	400	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	400	0.1	44	0	$5	$110	$30	16.5
Back stage work room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
S8 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	552	0.1	74	0	$8	$189	$20	20.6
S8 storage	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	800	0.0	14	0	$2	$33	$6	17.0
Stage	8	Halogen Incandescent: Bulb fixture - 1 lamp	Daylight Dimming	S	150	2,640	3	Relamp	No	8	LED Lamps: Bulb fixture - 1 lamp	Daylight Dimming	23	2,640	0.7	2,962	-1	$328	$242	$8	0.7
M1 Mech room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.1	174	0	$19	$219	$60	8.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
S9 storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	800	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	29	0	$3	$37	$10	8.2
Vestibuler 35	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
Vestibuler 35	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Handicap restroom	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
JC5 storage	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	800		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.0	0	0	$0	$0	$0	0.0
Handicap restroom	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	3,036		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.0	0	0	$0	$0	$0	0.0
E103 Band room	58	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	58	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	1.4	6,392	-1	$708	$2,118	$580	2.2
E103 Band room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
E103A office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.0	240	0	$27	$55	$15	1.5
Practice room 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.0	240	0	$27	$55	$15	1.5
Practice room 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.0	240	0	$27	$55	$15	1.5
E101 Music room	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.6	2,976	-1	$330	$986	$270	2.2
E101 Music room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
E hallway	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
E hallway	2	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	2	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.0	64	0	$7	$50	$2	6.8
E hallway	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Tel booth hall	14	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	14	LED Lamps: 4 pin - 1 lamps	High/Low Control	22	3,036	0.1	449	0	$50	$353	$14	6.8
E hallway men	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	3,036		None	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	0	0	$0	$0	$0	0.0
E hallway men	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	661	0	$73	$219	$60	2.2
E hallway women	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	3,036		None	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	0	0	$0	$0	$0	0.0
E hallway women	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.1	661	0	$73	$219	$60	2.2
Auditorium hall	3	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	52	4,400	3	Relamp	No	3	LED Lamps: 4 pin - 1 lamps	Wall Switch	36	4,400	0.0	227	0	$25	$76	$3	2.9
Auditorium hall	33	Halogen Incandescent: Screw-in 1 lamp	Daylight Dimming	S	250	2,640	3	Relamp	No	33	LED Lamps: Screw-in 1 lamp	Daylight Dimming	38	2,640	5.0	20,364	-4	$2,256	$997	$33	0.4
Auditorium hall	12	Halogen Incandescent: Wall sconces - 1 lamp	Daylight Dimming	S	250	2,640	3	Relamp	No	12	LED Lamps: Wall sconces - 1 lamp	Daylight Dimming	38	2,640	1.8	7,405	-2	$820	$363	$12	0.4
Auditorium hall	22	Halogen Incandescent: Cannister	Daylight Dimming	S	250	2,640	3	Relamp	No	22	LED Lamps: Cannister	Daylight Dimming	38	2,640	3.4	13,576	-3	$1,504	$665	$22	0.4

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Auditorium hall	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Control room	6	Halogen Incandescent: Screw-in 1 lamp	Daylight Dimming	S	250	2,640	3	Relamp	No	6	LED Lamps: Screw-in 1 lamp	Daylight Dimming	38	2,640	0.9	3,703	-1	$410	$181	$6	0.4
Auditorium	2	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	4,400	3	Relamp	No	2	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	4,400	0.0	151	0	$17	$101	$4	5.8
Hall by Auditorium	54	Compact Fluorescent: 4 pin - 2 lamps	High/Low Control	S	64	3,036	3	Relamp	No	54	LED Lamps: 4 pin - 2 lamps	High/Low Control	45	3,036	0.7	3,462	-1	$384	$2,726	$108	6.8
Hall by Auditorium	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Hall by Auditorium	2	Compact Fluorescent: (2) 13W Plug-In Lamps	High/Low Control	S	26	3,036	3	Relamp	No	2	LED Lamps: (2) 5W Plug-In Lamps	High/Low Control	10	3,036	0.0	107	0	$12	$101	$4	8.2
Vestibule 38	4	Compact Fluorescent: 4 pin - 1 lamp	None	S	32	4,400	3	Relamp	No	4	LED Lamps: 4 pin - 1 lamp	None	22	4,400	0.0	186	0	$21	$101	$4	4.7
Concession stand	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	800	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	800	0.1	87	0	$10	$110	$30	8.2
Hall by concession	26	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	26	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
Hall by concession	11	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	11	LED Lamps: 4 pin - 1 lamp	High/Low Control	22	3,036	0.1	353	0	$39	$278	$11	6.8
Trophy case	9	Linear Fluorescent - T8: 3' T8 (25W) - 1L	None	S	27	4,400	3	Relamp	No	9	LED - Linear Tubes: (1) 3' Lamp	None	11	4,400	0.1	719	0	$80	$164	$45	1.5
Drug addiction pin	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Data room 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,400	0.0	160	0	$18	$37	$10	1.5
Library	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,149	0	$238	$712	$195	2.2
MC Tech room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Library 2	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,036	3	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,036	0.4	1,874	0	$208	$621	$170	2.2
Library 1	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,488	0	$165	$493	$135	2.2
Main data room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,400	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,400	0.0	319	0	$35	$73	$20	1.5
MC storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	552	0.2	222	0	$25	$335	$60	11.2
39 vestibule	2	Compact Fluorescent: 4 pin - 1 lamp	None	S	32	4,400	3	Relamp	No	2	LED Lamps: 4 pin - 1 lamp	None	22	4,400	0.0	93	0	$10	$50	$2	4.7
Media center	84	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Daylight Dimming	S	93	2,640	3	Relamp	No	84	LED - Linear Tubes: (3) 4' Lamps	Daylight Dimming	44	2,640	3.0	12,075	-3	$1,338	$4,601	$1,260	2.5
Media center	26	Compact Fluorescent: 4 pin - 1 lamp	Daylight Dimming	S	32	2,640	3	Relamp	No	26	LED Lamps: 4 pin - 1 lamp	Daylight Dimming	22	2,640	0.2	725	0	$80	$656	$26	7.8
Media center	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Media center	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Daylight Dimming	S	62	2,640	3	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Daylight Dimming	29	2,640	0.2	958	0	$106	$365	$100	2.5
TV Area	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.1	479	0	$53	$110	$30	1.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Computer area	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	661	0	$73	$219	$60	2.2
Security office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Main office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
Office 4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Office 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Office 5	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.0	165	0	$18	$55	$15	2.2
Office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Office 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Attendance office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.0	240	0	$27	$55	$15	1.5
MO toilet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,036	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,036	0.0	53	0	$6	$33	$6	4.5
Office 6	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Main office hall	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.5	2,149	0	$238	$712	$195	2.2
Principal office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Work room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	496	0	$55	$164	$45	2.2
AP office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
AP office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.1	331	0	$37	$110	$30	2.2
Conference room	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.2	827	0	$92	$274	$75	2.2
Main office	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,036	3	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,036	0.3	1,322	0	$147	$438	$120	2.2
Main office	2	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	32	3,036	3	Relamp	No	2	LED Lamps: 4 pin - 1 lamp	Occupancy Sensor	22	3,036	0.0	64	0	$7	$50	$2	6.8
Main office	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Mail room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,400	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,400	0.0	240	0	$27	$55	$15	1.5
E hall	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	S	29	3,036		None	No	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,036	0.0	0	0	$0	$0	$0	0.0
Main lobby	49	Compact Fluorescent: 4 pin - 1 lamp	High/Low Control	S	32	3,036	3	Relamp	No	49	LED Lamps: 4 pin - 1 lamp	High/Low Control	22	3,036	0.3	1,571	0	$174	$1,237	$49	6.8
Main lobby	3	Compact Fluorescent: (2) 13W Plug-In Lamps	High/Low Control	S	26	3,036	3	Relamp	No	3	LED Lamps: (2) 5W Plug-In Lamps	High/Low Control	10	3,036	0.0	160	0	$18	$151	$6	8.2
Main lobby	4	LED Lamps: (2) 5W Plug-In Lamps	High/Low Control	S	10	3,036		None	No	4	LED Lamps: (2) 5W Plug-In Lamps	High/Low Control	10	3,036	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Main lobby	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main entrance	6	Compact Fluorescent: 4 pin - 1 lamp	None	S	32	4,400	3	Relamp	No	6	LED Lamps: 4 pin - 1 lamp	None	22	4,400	0.0	279	0	$31	$151	$6	4.7
Canopy	14	Compact Fluorescent: 4 pin - 1 lamp	Timeclock		32	4,380	3	Relamp	No	14	LED Lamps: 4 pin - 1 lamp	Timeclock	22	4,380	0.1	589	0	$66	$353	$14	5.1
Wall pack	46	Mercury Vapor: (1) 175W Lamp	Photocell		205	4,380	1	Fixture Replacement	No	46	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	62	4,380	3.3	28,912	0	$3,263	$44,434	$0	13.6
Wall mount	29	Compact Fluorescent: Door front - 2 lamps	Photocell		52	4,380	3	Relamp	No	29	LED Lamps: Door front - 2 lamps	Photocell	36	4,380	0.2	1,982	0	$224	$999	$58	4.2
Wall pack	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		54	4,380		None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	54	4,380	0.0	0	0	$0	$0	$0	0.0
Wall pack	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		42	4,380		None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	42	4,380	0.0	0	0	$0	$0	$0	0.0
Football field	4	Halogen Incandescent: Pole light - 21 lamp	Breaker Panel		100	312	3	Relamp	No	4	LED Lamps: Pole light - 21 lamp	Breaker Panel	15	312	0.2	106	0	$12	$2,538	$84	204.9
Parking lot	43	Mercury Vapor: Pole light - 1 lamp	Timeclock		250	4,380	1	Fixture Replacement	No	43	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	75	4,380	3.8	32,960	0	$3,720	$51,364	$0	13.8
Court yard	2	Compact Fluorescent: 4 pin - 1 lamp	Timeclock		26	4,380	3	Relamp	No	2	LED Lamps: 4 pin - 1 lamp	Timeclock	18	4,380	0.0	68	0	$8	$50	$2	6.3
Court yard	4	Mercury Vapor: Tubular light	Photocell		175	4,380	1	Fixture Replacement	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	53	4,380	0.2	2,146	0	$242	$3,864	$0	15.9
Court yard	1	Metal Halide: (1) 70W Lamp	Photocell		95	4,380	1	Fixture Replacement	No	1	LED - Fixtures: High-Bay	Photocell	29	4,380	0.0	291	0	$33	$775	$150	19.0
Court yard	3	Metal Halide: (1) 50W Lamp	Photocell		72	4,380	1	Fixture Replacement	No	3	LED - Fixtures: High-Bay	Photocell	22	4,380	0.1	662	0	$75	$2,325	$450	25.1
B Hall 2nd floor	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions: Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	Proposed Conditions: ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Energy Impact & Financial Analysis: Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	AH-1 Auditorium	1	Supply Fan	15.0	93.0%	No	B	4,000	6	No	93.0%	Yes	1	4.3	18,048	0	$2,037	$7,041	$1,200	2.9
Roof	AH-2 Media Center	1	Supply Fan	5.0	89.5%	No	B	4,000	6	No	89.5%	Yes	1	1.4	6,251	0	$706	$4,076	$400	5.2
Roof	AH-3 SGI/Teacher	1	Supply Fan	2.0	86.5%	No	B	4,000	6	No	86.5%	Yes	1	0.6	2,587	0	$292	$3,261	$160	10.6
Roof	AH-4 Gym	1	Supply Fan	20.0	93.0%	No	B	4,000	6	No	93.0%	Yes	1	5.7	24,065	0	$2,716	$8,582	$1,600	2.6
Roof	AH-5 Gym	1	Supply Fan	10.0	93.7%	No	B	4,000	6	No	93.7%	Yes	1	2.9	11,942	0	$1,348	$5,152	$800	3.2
Roof	AH-6 Admin	1	Supply Fan	7.5	91.0%	Yes	B	4,000		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	AH-7 Boys locker	1	Supply Fan	5.0	89.5%	No	B	4,000	6	No	89.5%	Yes	1	1.4	6,251	0	$706	$4,076	$400	5.2
Roof	AH-8 Girls locker	1	Supply Fan	5.0	89.0%	No	B	4,000	6	No	89.5%	Yes	1	1.4	6,350	0	$717	$4,076	$400	5.1
Roof	AH-9 Guidance/Nurse	1	Supply Fan	0.5	60.0%	Yes	B	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	AH-10 Auxilliary gym	1	Supply Fan	5.0	89.5%	No	B	4,000	6	No	89.5%	Yes	1	1.4	6,251	0	$706	$4,076	$400	5.2
Roof	AH-11 Music	1	Supply Fan	1.5	85.5%	No	B	4,000	6	No	86.5%	Yes	1	0.4	2,004	0	$226	$3,391	$120	14.5
Roof	AH-12 Theate	1	Supply Fan	1.5	86.0%	No	B	4,000	6	No	86.5%	Yes	1	0.4	1,972	0	$223	$3,391	$120	14.7
Roof	AH-13 Band	1	Supply Fan	5.0	89.0%	No	B	4,000	6	No	89.5%	Yes	1	1.4	6,350	0	$717	$4,076	$400	5.1
Roof	AH-14 Kitchen	1	Supply Fan	10.0	91.7%	No	B	4,000	6	No	91.7%	Yes	1	2.9	12,203	0	$1,377	$5,152	$800	3.2
Roof	AH-15 Cafeteria	1	Supply Fan	15.0	92.0%	No	B	4,000	6	No	93.0%	Yes	1	4.4	18,598	0	$2,099	$7,041	$1,200	2.8
Roof	AH-16 Class 0.A	1	Supply Fan	15.0	92.0%	No	B	4,000	6	No	93.0%	Yes	1	4.4	18,598	0	$2,099	$7,041	$1,200	2.8
Roof	AH-17 Class 0.A	1	Supply Fan	15.0	92.0%	No	B	4,000	6	No	93.0%	Yes	1	4.4	18,598	0	$2,099	$7,041	$1,200	2.8
Roof	AH-1 Auditorium	1	Return Fan	5.0	89.0%	No	B	4,000	6	No	89.5%	Yes	1	1.5	6,350	0	$717	$4,076	$400	5.1
Roof	AH-4,5 Gym	2	Return Fan	2.0	86.0%	No	B	4,000	6	No	86.5%	Yes	2	1.2	5,259	0	$594	$6,522	$320	10.4
Roof	AH-7,8 BLR, GLR	2	Return Fan	2.0	86.0%	No	B	4,000	6	No	86.5%	Yes	2	1.2	5,259	0	$594	$6,522	$320	10.4

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	AH-13 Band/ Choral	1	Return Fan	2.0	86.0%	No	B	4,000	6	No	86.5%	Yes	1	0.6	2,629	0	$297	$3,261	$160	10.4
Roof	AH-15,16,17	3	Return Fan	5.0	89.0%	No	B	4,000	6	No	89.5%	Yes	3	4.5	19,049	0	$2,150	$12,229	$1,200	5.1
Roof	AH-6	1	Return Fan	5.0	84.5%	Yes	B	4,000		No	84.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	AH-14	1	Return Fan	5.0	84.5%	No	B	4,000	6	No	89.5%	Yes	1	1.6	7,287	0	$823	$4,076	$400	4.5
Roof	MUA	1	Supply Fan	3.0	89.0%	No	B	4,000	6	No	89.5%	Yes	1	0.9	3,810	0	$430	$3,884	$240	8.5
Roof	AHU for auditorium	1	Supply Fan	7.5	91.0%	No	B	4,000	6	No	91.0%	Yes	1	2.1	9,223	0	$1,041	$4,738	$600	4.0
Roof	AHU for auditorium	1	Supply Fan	7.5	91.0%	No	B	4,000	6	No	91.0%	Yes	1	2.1	9,223	0	$1,041	$4,738	$600	4.0
Upper boiler room	HWP-1	1	Heating Hot Water Pump	20.0	88.0%	Yes	W	4,000	5	Yes	93.0%	No		0.5	2,735	0	$309	$2,248	$0	7.3
Upper boiler room	HWP-2	1	Heating Hot Water Pump	20.0	88.0%	Yes	W	4,000	5	Yes	93.0%	No		0.5	2,735	0	$309	$2,248	$0	7.3
Upper boiler room	CWP-1	1	Chilled Water Pump	25.0	93.6%	No	W	2,000	7	No	93.6%	Yes	1	4.6	14,944	0	$1,687	$10,845	$1,500	5.5
Upper boiler room	CWP-2	1	Chilled Water Pump	25.0	93.6%	No	W	2,000	7	No	93.6%	Yes	1	4.6	14,944	0	$1,687	$10,845	$1,500	5.5
Upper boiler room	Back circ. Loop	1	Water Supply Pump	0.0	60.0%	No	W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Upper boiler room	DHW booster	1	Water Supply Pump	0.3	60.0%	No	W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Upper boiler room	Cold water DCW booster	3	Water Supply Pump	5.0	86.5%	No	W	8,760		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-1	1	Supply Fan	15.0	93.0%	No	B	4,000	6	No	93.0%	Yes	1	4.3	18,048	0	$2,037	$7,041	$1,200	2.9
Boiler room	CHWP - 6,7, Bldg, Pump	2	Chilled Water Pump	5.0	90.2%	Yes	W	2,000		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
Boiler room	CHWP-3,4 Chiller pump	2	Chilled Water Pump	3.0	90.2%	Yes	W	2,000		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
Boiler room	HWP - 1,2	2	Heating Hot Water Pump	3.0	90.2%	Yes	W	4,000		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
Elevator machine room	Hydraulic pump	1	Process Pump	25.0	93.0%	No	W	800		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage	Hot water unit heater	5	Other	0.1	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen hood	Kitchen	1	Kitchen Hood Exhaust Fan	0.8	60.0%	No	W	5,250		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Media Ex MPEF-1	1	Exhaust Fan	1.0	85.0%	No	W	4,000		No	85.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	TE-1	1	Exhaust Fan	0.5	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	TE-2,3 SE-1	3	Exhaust Fan	0.3	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	TE-4,6	2	Exhaust Fan	0.2	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	TE-5, SE-2	2	Exhaust Fan	0.3	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Data room Rm 160E	1	Supply Fan	0.5	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Combustion Air supply MCA-1	1	Combustion Air Fan	3.0	89.5%	No	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom	1	Exhaust Fan	0.3	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Mech room	1	Exhaust Fan	0.0	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust fans	12	Exhaust Fan	0.3	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
C hallway 2nd floor	C hallway 2nd floor	4	Supply Fan	0.2	60.0%	No	W	4,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Security office	P-1	1	Packaged Terminal AC	6.60		B	9	Yes	1	Packaged Terminal AC	6.60		12.00		0.9	1,911	0	$216	$12,638	$429	56.6
Roof	Data 160E Room	1	Ductless Mini-Split AC	3.00		B	8	Yes	1	Ductless Mini-Split AC	3.00		18.00		0.7	1,467	0	$166	$8,218	$0	49.6
Elevator room	Room 113A	1	Split-System AC	0.75		B	8	Yes	1	Split-System AC	0.75		14.00		0.1	218	0	$25	$1,122	$69	42.8

Electric Chiller Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Remaining Useful Life	ECM #	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Existing building	1	Air-Cooled Screw Chiller	250.00	B	10	Yes	1	Air-Cooled Screw Chiller	Variable	250.00	1.24	0.73	53.5	82,988	0	$9,367	$242,216	$23,000	23.4
Roof	Existing building	2	Air-Cooled Screw Chiller	250.00	B	10	Yes	2	Air-Cooled Screw Chiller	Variable	250.00	1.24	0.73	23.2	35,976	0	$4,061	$484,431	$46,000	108.0
Roof	New section	1	Air-Cooled Scroll Chiller	150.00	B	10	Yes	1	Air-Cooled Scroll Chiller	Variable	150.00	1.24	0.73	13.9	21,645	0	$2,443	$206,259	$13,800	78.8

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mech section	Combustion Air MCA-1	1	Furnace	400.00	B	11	Yes	1	Furnace	400.00	95.00%	AFUE	0.0	0	22	$220	$9,063	$400	39.4
GUH	Unit heater	1	Warm Air Unit Heater	80.00	B	12	Yes	1	Warm Air Unit Heater	80.00	93.00%	Et	0.0	0	4	$39	$2,338	$0	60.0
Upper boiler room	1st and 2nd floor - Existing building	32	Non-Condensing Hot Water Boiler	335.16	B		No						0.0	0	0	$0	$0	$0	0.0
Boiler room	New Addition	2	Condensing Hot Water Boiler	######	W		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Upper boiler room	New section	1	Storage Tank Water Heater (> 50 Gal)	N		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	13	20	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	57	$567	$143	$0	0.3

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Medium Temp Freezer (0F to 30F)		No	No	No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Cooler (35F to 55F)		No	No	No	0.0	0	0	$0	$0	$0	0.0

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Ice Making Head (<450 lbs/day), Batch	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Ice Making Head (<450 lbs/day), Batch	Yes		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Insulated Food Holding Cabinet (1/2 Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Insulated Food Holding Cabinet (1/2 Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	6	Electric Steamer	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Steamer	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Griddle (4 Feet Width)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Steamer	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Combination Oven/Steam Cooker (<15 Pans)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Convection Oven (Half Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

Location	Existing Conditions			
	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Barnegat HS	435	Desktop Computer	145.0	Yes
Barnegat HS	25	Chrome book cart	40.0	Yes
Barnegat HS	20	Server	1,200.0	Yes
Barnegat HS	100	Printer - Small	60.0	Yes
Barnegat HS	21	Printer - Medium	80.0	Yes
Barnegat HS	13	Printer - Large	200.0	Yes
Barnegat HS	5	Paper shredder	200.0	Yes
Barnegat HS	82	Projector	400.0	Yes
Barnegat HS	14	Microwave	900.0	Yes
Barnegat HS	4	Refrigerator - Small	70.0	Yes
Barnegat HS	3	Refrigerator - Medium	90.0	Yes
Barnegat HS	6	Refrigerator - Large	220.0	Yes
Barnegat HS	9	Coffee Machine	400.0	Yes
Barnegat HS	3	Toaster	900.0	Yes
Barnegat HS	4	Toaster oven	1,200.0	Yes
Barnegat HS	1	Clothes Washer	900.0	Yes
Barnegat HS	1	Clothes Dryer	1,500.0	Yes
Barnegat HS	5	Dishwasher	1,000.0	Yes
Barnegat HS	2	CRT - Television	130.0	Yes
Barnegat HS	2	LCD - Television	120.0	Yes
Barnegat HS	5	LCD - Television	120.0	Yes
Barnegat HS	3	Hot and Cold water dispenser	520.0	Yes
Barnegat HS	1	Kiln	17,300.0	Yes
Barnegat HS	1	Electric stove	3,000.0	Yes
Barnegat HS	7	Smart board	5.0	Yes
Barnegat HS	1	Insulated cabinet	1,500.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
High School	5	Refrigerated	14	Yes	0.9	8,059	0	$910	$1,150	$250	1.0

Appendix B: ENERGY STAR® Statement of Energy Performance

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

LEARN MORE AT energystar.gov

ENERGY STAR® Statement of Energy Performance

21

ENERGY STAR® Score[1]

Barnegat Township High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 201,214
Built: 2004

For Year Ending: June 30, 2019
Date Generated: July 30, 2019

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Barnegat Township High School 180 Bengal Blvd Barnegat, New Jersey 08005	Barnegat Township School District 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 (____)____-______	Stephen Brennan 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 609-698-5800 SBRENNAN@BARNEGATSCHOOLS.COI

Property ID: 7071485

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
77.4 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	9,507,666 (61%)
Natural Gas (kBtu)	6,068,334 (39%)

Source EUI
164 kBtu/ft²

National Median Comparison

National Median Site EUI (kBtu/ft²)	57.9
National Median Source EUI (kBtu/ft²)	122.7
% Diff from National Median Source EUI	34%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	1,286

Signature & Stamp of Verifying Professional

I __________________ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _______________________ Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer Stamp
(if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gas* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.
gpf	*Gallons per flush*

gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp.
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units.
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp.
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp.
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge.
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense™	The symbol for water efficiency. The WaterSense™ program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.

Local Government Energy Audit Report

Robert L. Horbelt Elementary School

October 31, 2019

Prepared for:
Barnegat Township School District
104 Burr Street
Barnegat, New Jersey 08005

Prepared by:
TRC
900 Route 9 North
Woodbridge, New Jersey 07095

Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC reviewed the energy conservation measures and estimates of energy savings were reviewed for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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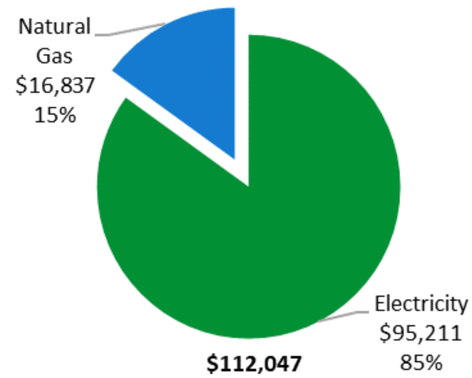
Table of Contents

1 Executive Summary

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Robert L. Horbelt Elementary School. This report provides you with information about the Elementary School's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in the Elementary School. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $112,047 Electricity: 786,130 kWh Natural Gas: 15,519 Therms	
ENERGY STAR® Benchmarking Score	53 *(1-100 scale)*	Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance and lower your energy bills even more.

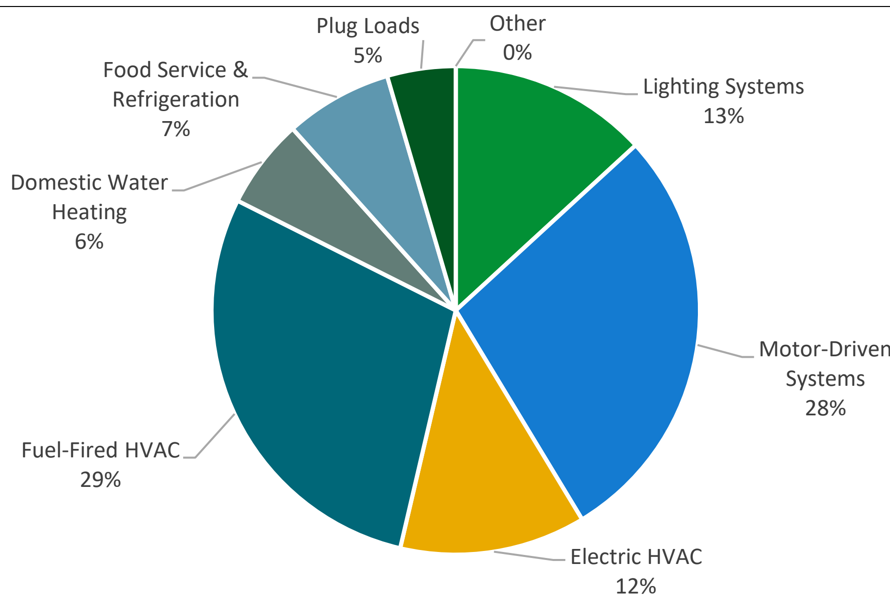


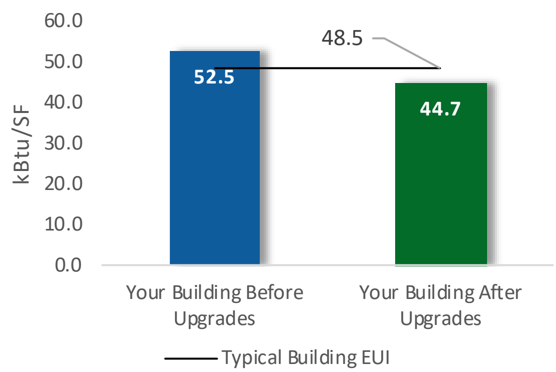
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

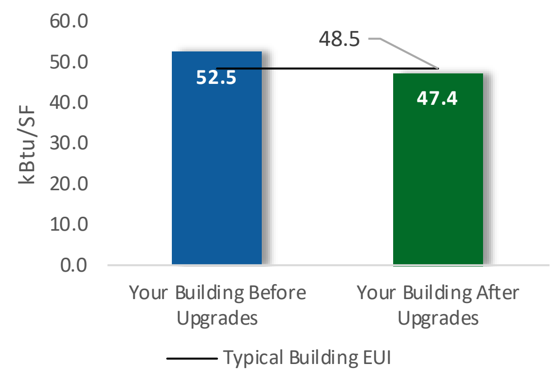
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$571,679
Potential Rebates & Incentives[1]	$42,688
Annual Cost Savings	$21,073
Annual Energy Savings	Electricity: 169,007 kWh Natural Gas: 557 Therms
Greenhouse Gas Emission Savings	88 Tons
Simple Payback	25.1 Years
Site Energy Savings (all utilities)	15%



Scenario 2: Cost Effective Package[2]

Installation Cost	$85,669
Potential Rebates & Incentives	$15,957
Annual Cost Savings	$15,160
Annual Energy Savings	Electricity: 126,744 kWh
Greenhouse Gas Emission Savings	63 Tons
Simple Payback	4.6 Years
Site Energy Savings (all utilities)	10%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	*Cost Effective?*	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**86,371**	**28.7**	**-16**	**$10,290**	**$79,033**	**$14,532**	**$64,501**	**6.3**	**85,134**
ECM 1	Install LED Fixtures	No	10,534	1.0	0	$1,276	$28,954	$3,100	$25,854	20.3	10,608
ECM 2	Retrofit Fixtures with LED Lamps	Yes	75,837	27.7	-16	$9,014	$50,079	$11,432	$38,647	4.3	74,526
Lighting Control Measures			**8,757**	**2.6**	**-2**	**$1,041**	**$11,801**	**$875**	**$10,926**	**10.5**	**8,604**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	5,648	1.7	-1	$671	$7,178	$875	$6,303	9.4	5,549
ECM 4	Install High/Low Lighting Controls	Yes	3,110	0.9	-1	$370	$4,623	$0	$4,623	12.5	3,055
Variable Frequency Drive (VFD) Measures			**40,538**	**13.7**	**0**	**$4,910**	**$23,559**	**$3,600**	**$19,959**	**4.1**	**40,821**
ECM 5	Install VFDs on Constant Volume (CV) Fans	Yes	40,538	13.7	0	$4,910	$23,559	$3,600	$19,959	4.1	40,821
Electric Unitary HVAC Measures			**31,729**	**13.3**	**0**	**$3,843**	**$351,172**	**$12,251**	**$338,921**	**88.2**	**31,951**
ECM 6	Install High Efficiency Heat Pumps	No	31,729	13.3	0	$3,843	$351,172	$12,251	$338,921	88.2	31,951
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**73**	**$794**	**$105,885**	**$11,380**	**$94,505**	**119.0**	**8,574**
ECM 7	Install High Efficiency Hot Water Boilers	No	0	0.0	73	$794	$105,885	$11,380	$94,505	119.0	8,574
Food Service & Refrigeration Measures			**1,612**	**0.2**	**0**	**$195**	**$230**	**$50**	**$180**	**0.9**	**1,623**
ECM 8	Vending Machine Control	Yes	1,612	0.2	0	$195	$230	$50	$180	0.9	1,623
TOTALS (COST EFFECTIVE MEASURES)			**126,744**	**44.2**	**-18**	**$15,160**	**$85,669**	**$15,957**	**$69,712**	**4.6**	**125,574**
TOTALS (ALL MEASURES)			**169,007**	**58.5**	**56**	**$21,073**	**$571,679**	**$42,688**	**$528,991**	**25.1**	**176,708**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	x	x	
ECM 2	Retrofit Fixtures with LED Lamps	x	x	
ECM 3	Install Occupancy Sensor Lighting Controls	x	x	
ECM 4	Install High/Low Lighting Controls		x	
ECM 5	Install VFDs on Constant Volume (CV) HVAC	x		
ECM 6	Install High Efficiency Heat Pumps	x	x	
ECM 7	Install High Efficiency Hot Water Boilers	x		
ECM 8	Vending Machine Control	x	x	

Figure 3 – Funding Options

New Jersey's Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility, and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Robert L. Horbelt Elementary School. This report provides information on how the Elementary School uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see **Appendix A: Equipment Inventory & Recommendations.**

2.1 Site Overview

On July 3, 2019, TRC performed an energy audit at Robert L. Horbelt Elementary School located in Barnegat, New Jersey. TRC met with Neil Piro to review the facility operations and help focus our investigation on specific energy-using systems.

Robert L. Horbelt Elementary School is a single-story, 80,586 square foot building built in 2001. Spaces include: classrooms, a gymnasium, an auditorium, offices, a cafeteria, corridors, a commercial kitchen, and mechanical space. The Elementary School has onsite generation PV system and is a 100% heated and cooled.

2.2 Building Occupancy

The Elementary School is occupied from September through June. Typical weekday occupancy is approximately 60 staff and 494 students.

Building Name	Weekday/Weekend	Operating Schedule
Robert L. Horbelt Elementary School	Weekday	6:00 AM - 5:00 PM
	Weekend	Saturday: 10:00 AM - 4:00 PM Sunday: 8:30 AM - 11:30 PM (winter only)

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a concrete block facade. The dividing walls are made of concrete masonry units. The roof is mainly flat, covered with black membrane and in good condition. Some pitched portions of the roof are made of metal cladding panels.

Most of the windows are double-glazed that have aluminum frames with a thermal break. The glass-to-frame seals are in good condition. Exterior doors have metal fire proof doors and are in good condition.

Pitched Metal Roof

Flat Rubber Roof

Exterior Doors

Façade and Windows

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. Additionally, there are some 26-watt 4-pin compact fluorescent lamps (CFL). Typically, T8 fluorescent lamps use electronic ballasts.

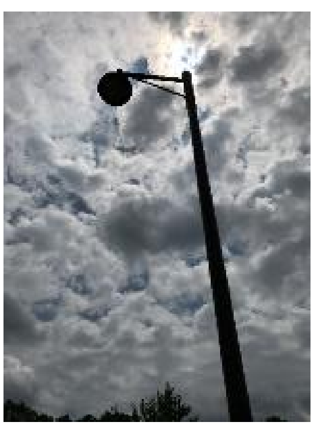
Fixture types include 2-, 3-, or 4-lamp, 2- or 4-foot long troffers, and surface-mounted fixtures, 2-foot fixtures with linear tube lamps. Many fixtures are controlled using wall-or remote-mounted occupancy sensors. Most fixtures are in good condition.

All exit signs are LED units. Interior lighting levels were generally sufficient.

The exterior fixtures consist of 26-watt 4 pin CFL fixtures, 42- and 57-watt wall-mounted LED fixtures, and 70-watt metal halide fixtures. The exterior fixtures are controlled using photocells or timeclocks.

Lighting in the Classroom

Outdoor Wall-mounted Fixture



Pole-mounted Exterior Fixture

Multi-purpose Room High-ceiling Fixture

2.5 Air Handling Systems

Heat pump units

The building is mainly conditioned by distributed water source heat pumps with cooling capacities ranging from 1.5- to 5-tons and heating capacities ranging from 26 to 129 MBh. Ground water is distributed to the heat pumps by two variable speed 40 hp circulation pumps. The boiler provides supplemental hot water to the loop when needed. The heat pump units have supply fans of 1.5 hp and EER ratings that range from 10.5 to 12.4. There are several energy recovery units on the roof with supply and return fans of various capacities.

Space temperatures in the zones, as well as loop temperatures, are controlled using an EMS. All units have passed their useful life and been evaluated for replacements.

Energy Recovery Units

Water Source Heat Pump Unit

Water Source Heat Pump Unit

Heat Pump Supply Pumps

2.6 Heating Hot Water Systems

Two condensing hot water Aerco boilers and two non-condensing hot water De Dietrich boilers serve the heat pumps located in the new and older sections, respectively. The boilers have an output capacity of 1694 and 2845 MBH, respectively, and efficiencies of 85% and 83%.

Ground water is circulated to the boilers where it is heated as required, and then distributed using two variable speed 2 and 5 hp pumps to heat pumps located in the respective zones. The boilers also provide hot water to several convectors and unit heaters.

Space and loop temperatures are controlled using an EMS. A roof-mounted cooling tower with a variable speed 7.5 hp fan helps regulate the loop temperature.

The non-condensing boilers serving the older section were installed in the year 1999 and have been evaluated for replacement. The condensing boilers serving the newer section were installed in the year 2008 and are within the useful life of the equipment.

Non-condensing Hot Water Boilers

Condensing Hot Water Boilers

Heating Hot Water Pumps

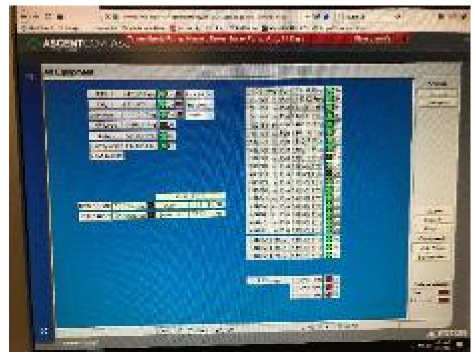
VFD

2.7 Building Energy Management Systems (EMS)

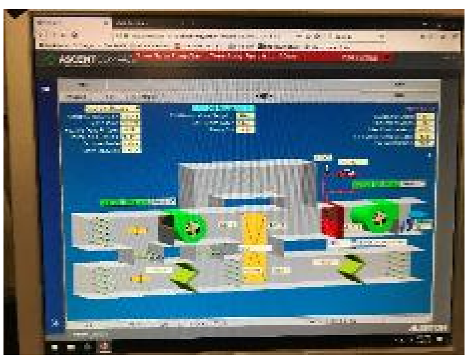
An Ascent Compass (by Allerton) EMS controls the HVAC equipment, boilers, water source heat pump units, air handlers, and heat recovery units (HRU). The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, and heating water loop temperatures.

The site staff expressed that the existing system in place is incapable of controlling and handling the load and might need an expansion in the level of control.

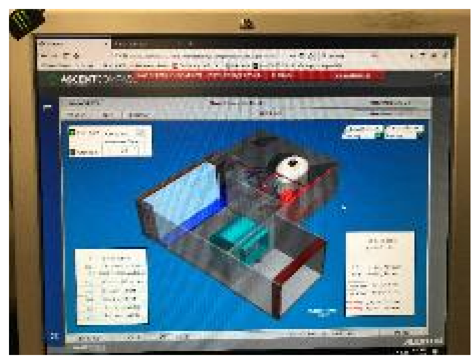
Floor 1–Spaces, Units, and Temperatures



EMS Shot Showing All Equipment Controlled



Heat Pump Unit



Main Office Heat Pump Unit

2.8 Domestic Hot Water

One gas-fired and one electric water heater serve the domestic hot water needs of the Elementary School. The Laars gas-fired unit has an input capacity of 250 MBh, a tank capacity of 100 gallons, and 80% efficiency. The unit was installed in 2015 and is in good condition and well-maintained. The AO Smith unit is electric and has an input capacity of 24kW and a tank capacity of 30 gallons. This unit has passed its useful life.

Hot water is distributed to the end uses using fractional horse power circulating pumps.

Laars Gas-fired Unit

AO Smith electric Unit

2.9 Food Service and Refrigeration Equipment

The kitchen has a mix of gas and electric equipment including gas convection oven, steamer, and a griddle that are used to prepare meals for students. Most cooking is done using a convection gas-fired oven. Bulk prepared foods are held in several electric holding cabinets. Equipment is high-efficiency and in good condition.

The kitchen has several stand-up solid door refrigerators. There are also refrigerator and freezer chests. All equipment is standard efficiency and appears to be in good condition.

The walk-in refrigerator has an estimated 0.75-ton compressor and a two-fan evaporator. The walk-in medium temperature freezer has an approximately 0.9-ton compressor and a two-fan evaporator with defrost controls.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high-efficiency food service equipment.

Convection Oven

Walk-in Refrigerator

Reach -in Refrigerator

Walk-in Evaporator Fan

2.10 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 5% percent of total building energy use. This is higher than a typical building.

You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area, as well as Energy Efficient Best Practices.

There are approximately 113 computer work stations throughout the Elementary School. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as Smart Boards, projectors, and fans. There are several residential-style refrigerators throughout the building that are used to store food for the staff. These vary in condition and efficiency.

There is one refrigerated beverage vending machines and one non-refrigerated vending machines. Vending machines are not equipped with occupancy-based controls.

2.11 Water-Using Systems

Faucet flow rates are at 1.5 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

2.12 On-Site Generation

Robert L. Horbelt Elementary School has approximately 170 panels and a 50 kW photovoltaic (PV) array that was installed in 2011. This system provides approximately 5.2% of the electricity used at the Elementary School and was financed by a Power Purchase Agreement (PPA).

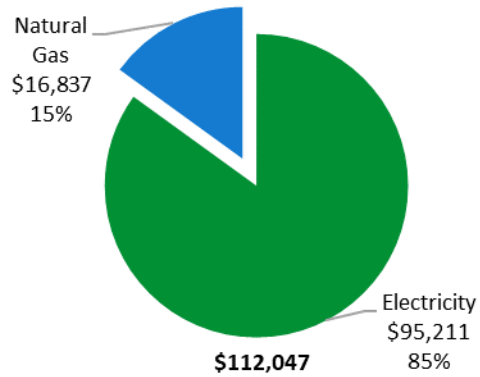
Solar Array

Solar Array

3 ENERGY USE AND COSTS

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	786,130 kWh	$95,211
Natural Gas	15,519 Therms	$16,837
Total		**$112,047**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

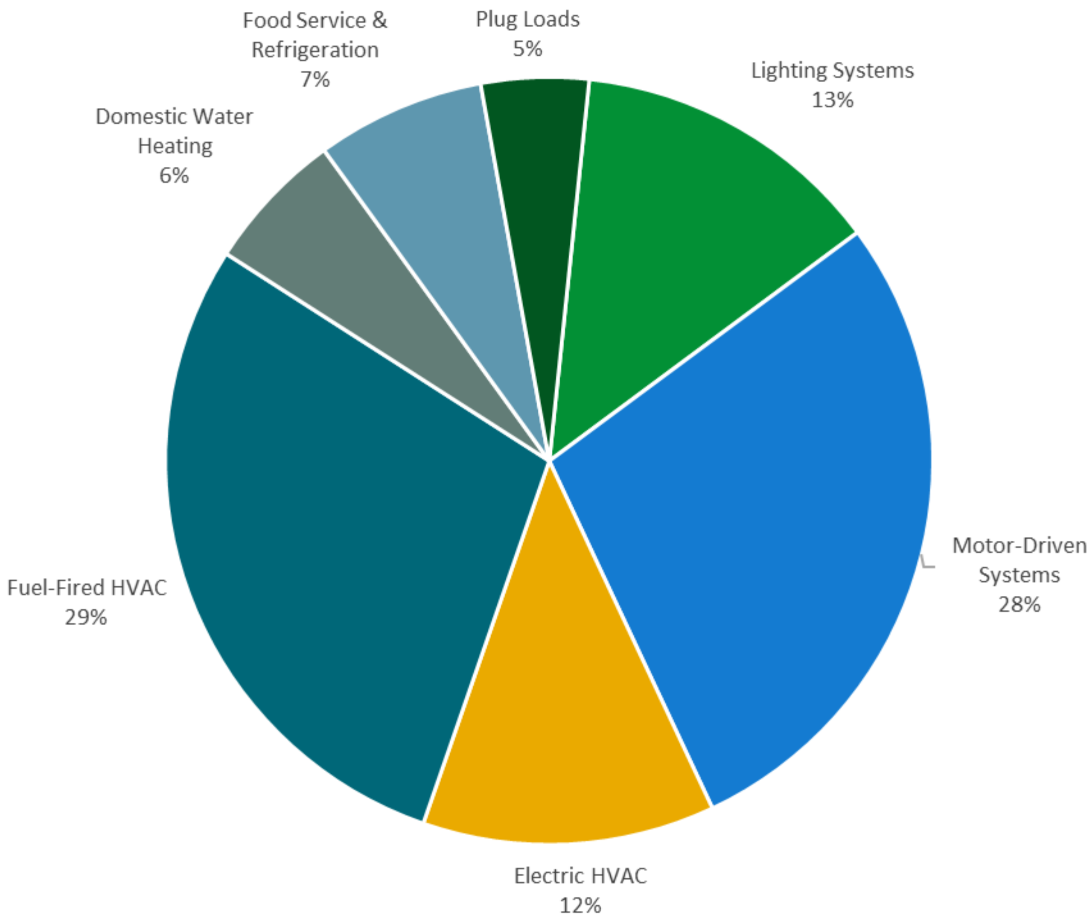
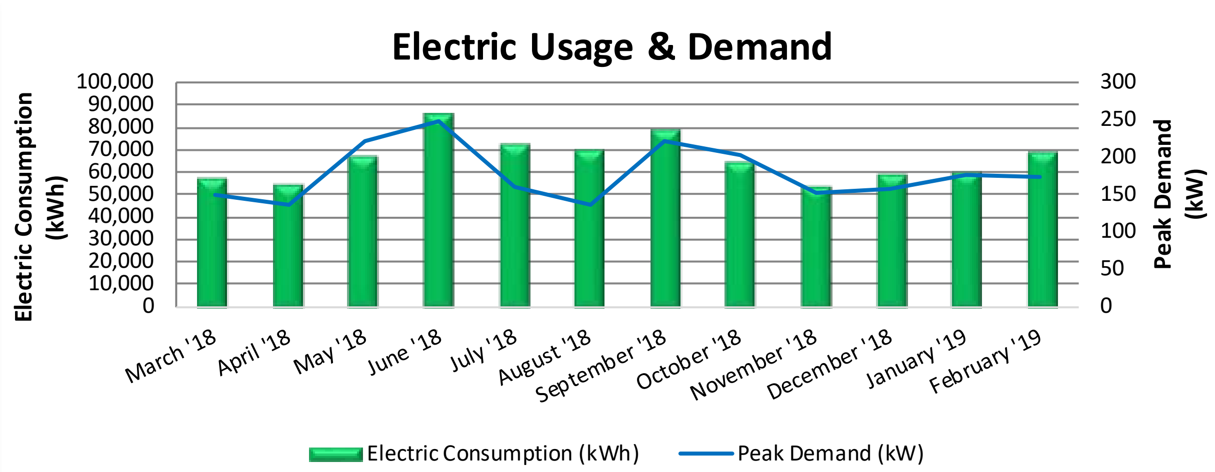


Figure 5 - Energy Balance

3.1 Electricity

JCP&L delivers electricity under rate class GSSS, with electric production provided by South Jersey Energy, a third-party supplier.



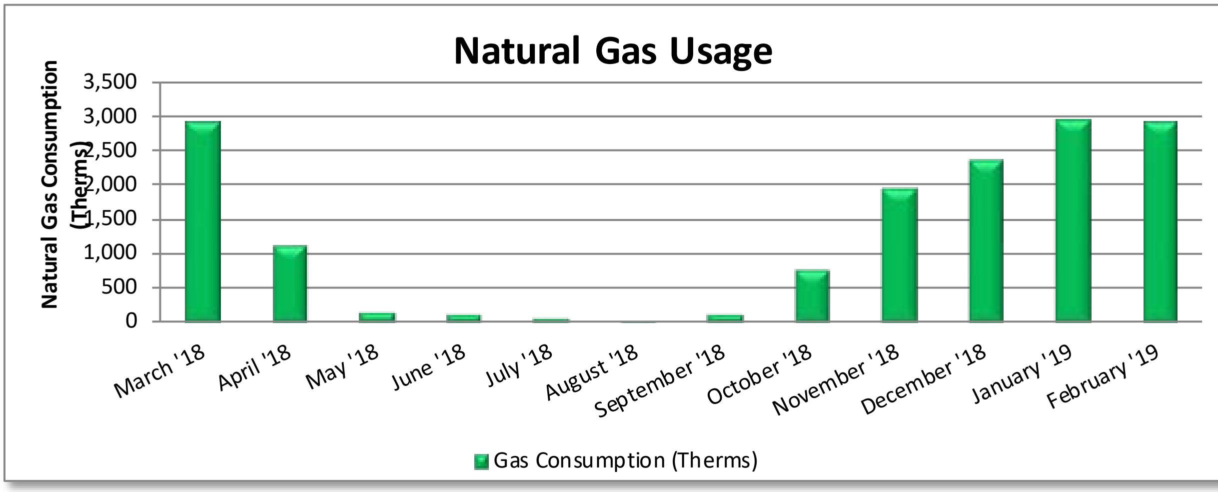
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
3/27/18	30	56,851	150	$921	$6,105
4/25/18	29	54,099	137	$803	$6,080
5/25/18	30	66,559	221	$1,320	$7,605
6/26/18	32	85,831	249	$1,609	$9,679
7/26/18	30	72,320	161	$1,016	$7,863
8/27/18	32	69,514	136	$849	$7,378
9/26/18	30	77,912	222	$1,423	$8,661
10/25/18	29	64,095	204	$1,218	$8,030
11/27/18	33	53,329	151	$885	$6,522
12/27/18	30	59,100	158	$929	$7,626
1/25/19	29	59,929	176	$1,042	$12,322
2/26/19	32	68,745	173	$1,025	$7,602
Totals	**366**	**788,284**	**249**	**$13,040**	**$95,471**
Annual	**365**	**786,130**	**249**	**$13,004**	**$95,211**

Notes:

- Peak demand of 249 kW occurred in June '18.
- The average electric cost over the past 12 months was $0.121/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

NJ Natural Gas delivers natural gas under rate class GSL, with natural gas supply provided by South Jersey Energy, a third-party supplier.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
4/6/18	30	2,905	$2,600
5/2/18	26	1,111	$1,165
6/1/18	30	160	$149
7/5/18	34	127	$402
8/2/18	28	60	$349
8/28/18	26	55	$347
10/1/18	34	118	$373
11/1/18	31	758	$866
12/4/18	33	1,953	$1,781
12/31/18	27	2,343	$2,793
2/1/19	32	2,929	$3,069
3/5/19	32	2,915	$2,850
Totals	**363**	**15,434**	**$16,744**
Annual	**365**	**15,519**	**$16,837**

Notes:

- The average gas cost for the past 12 months is $1.085/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

Benchmarking Score	53

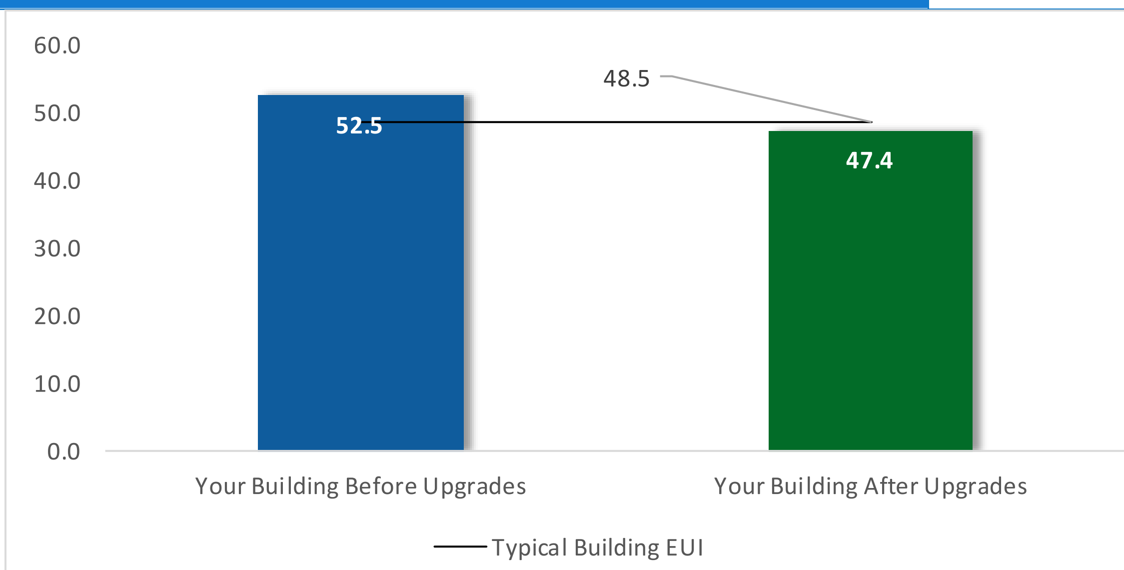


Figure 6 - Energy Use Intensity Comparison

Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance, and lower your energy bills even more.

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause a~~s~~ building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**86,371**	**28.7**	**-16**	**$10,290**	**$79,033**	**$14,532**	**$64,501**	**6.3**	**85,134**
ECM 1	Install LED Fixtures	10,534	1.0	0	$1,276	$28,954	$3,100	$25,854	20.3	10,608
ECM 2	Retrofit Fixtures with LED Lamps	75,837	27.7	-16	$9,014	$50,079	$11,432	$38,647	4.3	74,526
Lighting Control Measures		**8,757**	**2.6**	**-2**	**$1,041**	**$11,801**	**$875**	**$10,926**	**10.5**	**8,604**
ECM 3	Install Occupancy Sensor Lighting Controls	5,648	1.7	-1	$671	$7,178	$875	$6,303	9.4	5,549
ECM 4	Install High/Low Lighting Controls	3,110	0.9	-1	$370	$4,623	$0	$4,623	12.5	3,055
Variable Frequency Drive (VFD) Measures		**40,538**	**13.7**	**0**	**$4,910**	**$23,559**	**$3,600**	**$19,959**	**4.1**	**40,821**
ECM 5	Install VFDs on Constant Volume (CV) Fans	40,538	13.7	0	$4,910	$23,559	$3,600	$19,959	4.1	40,821
Electric Unitary HVAC Measures		**31,729**	**13.3**	**0**	**$3,843**	**$351,172**	**$12,251**	**$338,921**	**88.2**	**31,951**
ECM 6	Install High Efficiency Heat Pumps	31,729	13.3	0	$3,843	$351,172	$12,251	$338,921	88.2	31,951
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**73**	**$794**	**$105,885**	**$11,380**	**$94,505**	**119.0**	**8,574**
ECM 7	Install High Efficiency Hot Water Boilers	0	0.0	73	$794	$105,885	$11,380	$94,505	119.0	8,574
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$195**	**$230**	**$50**	**$180**	**0.9**	**1,623**
ECM 8	Vending Machine Control	1,612	0.2	0	$195	$230	$50	$180	0.9	1,623
TOTALS		**169,007**	**58.5**	**56**	**$21,073**	**$571,679**	**$42,688**	**$528,991**	**25.1**	**176,708**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**75,837**	**27.7**	**-16**	**$9,014**	**$50,079**	**$11,432**	**$38,647**	**4.3**	**74,526**
ECM 2	Retrofit Fixtures with LED Lamps	75,837	27.7	-16	$9,014	$50,079	$11,432	$38,647	4.3	74,526
Lighting Control Measures		**8,757**	**2.6**	**-2**	**$1,041**	**$11,801**	**$875**	**$10,926**	**10.5**	**8,604**
ECM 3	Install Occupancy Sensor Lighting Controls	5,648	1.7	-1	$671	$7,178	$875	$6,303	9.4	5,549
ECM 4	Install High/Low Lighting Controls	3,110	0.9	-1	$370	$4,623	$0	$4,623	12.5	3,055
Variable Frequency Drive (VFD) Measures		**40,538**	**13.7**	**0**	**$4,910**	**$23,559**	**$3,600**	**$19,959**	**4.1**	**40,821**
ECM 5	Install VFDs on Constant Volume (CV) Fans	40,538	13.7	0	$4,910	$23,559	$3,600	$19,959	4.1	40,821
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$195**	**$230**	**$50**	**$180**	**0.9**	**1,623**
ECM 8	Vending Machine Control	1,612	0.2	0	$195	$230	$50	$180	0.9	1,623
TOTALS		**126,744**	**44.2**	**-18**	**$15,160**	**$85,669**	**$15,957**	**$69,712**	**4.6**	**125,574**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**86,371**	**28.7**	**-16**	**$10,290**	**$79,033**	**$14,532**	**$64,501**	**6.3**	**85,134**
ECM 1	Install LED Fixtures	10,534	1.0	0	$1,276	$28,954	$3,100	$25,854	20.3	10,608
ECM 2	Retrofit Fixtures with LED Lamps	75,837	27.7	-16	$9,014	$50,079	$11,432	$38,647	4.3	74,526

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources is proposed, we suggest converting all fixtures of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the Elementary School, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

Replace existing fixtures containing HID lamps with new LED light fixtures. This measure saves energy by installing LEDs, which use less power than other technologies with a comparable light output.

In some cases, HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixture(s).

Maintenance savings may also be achieved, as LED lamps last longer than other light sources and therefore do not need to be replaced as often.

Affected building areas: exterior fixtures.

ECM 2: Retrofit Fixtures with LED Lamps

Replace fluorescent or CFL with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as direct replacements for most other lighting technologies.

This measure saves energy by installing LEDs, which use less power than other lighting technologies while providing equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes and CFL.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**8,757**	**2.6**	**-2**	**$1,041**	**$11,801**	**$875**	**$10,926**	**10.5**	**8,604**
ECM 3	Install Occupancy Sensor Lighting Controls	5,648	1.7	-1	$671	$7,178	$875	$6,303	9.4	5,549
ECM 4	Install High/Low Lighting Controls	3,110	0.9	-1	$370	$4,623	$0	$4,623	12.5	3,055

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 3: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote-mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected building areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms.

ECM 4: Install High/Low Lighting Controls

Install occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low levels after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

The control lowers the light level by dimming the fixture output. Therefore, the controlled fixtures need to have a dimmable ballast or driver. This will need to be taken into account when selecting retrofit lamps and bulbs for the areas proposed for high/low control.

This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

Affected building areas: hallways

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**40,538**	**13.7**	**0**	**$4,910**	**$23,559**	**$3,600**	**$19,959**	**4.1**	**40,821**
ECM 5	Install VFDs on Constant Volume (CV) Fans	40,538	13.7	0	$4,910	$23,559	$3,600	$19,959	4.1	40,821

Variable frequency drives (VFDs) control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor to conservatively account for the cost of an inverter duty rated motor.

Premium efficiency motors have been proposed to be installed only in conjunction with proposed VFD motor measures. Non-inverter duty rated motors will need to be replaced when the VFD measure is implemented.

ECM 5: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone while maintaining a constant supply air temperature.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: supply and the return fans of the RTU and the AHU (15 hp and 7.5 hp).

4.4 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**31,729**	**13.3**	**0**	**$3,843**	**$351,172**	**$12,251**	**$338,921**	**88.2**	**31,951**
ECM 6	Install High Efficiency Heat Pumps	31,729	13.3	0	$3,843	$351,172	$12,251	$338,921	88.2	31,951

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units at the Elementary School are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high-efficiency unit can be justified by the marginal savings from the improved efficiency. When the heat pump units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 6: Install High-Efficiency Heat Pumps

Replace standard efficiency heat pumps with high-efficiency heat pumps. A higher EER or SEER rating indicates a more efficient cooling system and a higher HSPF rating indicates more efficient heating mode. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high-efficiency unit, average heating and cooling loads, and estimated annual operating hours.

4.5 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**73**	**$794**	**$105,885**	**$11,380**	**$94,505**	**119.0**	**8,574**
ECM 7	Install High Efficiency Hot Water Boilers	0	0.0	73	$794	$105,885	$11,380	$94,505	119.0	8,574

ECM 7: Install High-Efficiency Hot Water Boilers

Replace older inefficient hot water boilers with high-efficiency hot water boilers. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

The most notable efficiency improvement is condensing hydronic boilers, which can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high-efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers are evaluated when the return water temperature is less than 130°F during most of the operating hours.

For the purposes of this analysis, we evaluated the replacement of boilers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your mechanical design team to select boilers that are sized appropriately for the heating load at the Elementary School. In many cases, installing multiple modular boilers rather than one or two large boilers will result in higher overall plant efficiency while providing additional system redundancy.

Replacing the boilers has a long payback and may not be justifiable based simply on energy considerations. However, the boilers are nearing the end of their normal useful life. Typically, the marginal cost of purchasing high-efficiency boilers can be justified by the marginal savings from the improved efficiency. When the boiler is eventually replaced, consider purchasing boilers that exceed the minimum efficiency required by building codes. We also recommend working with your mechanical design team to determine whether the heating system can operate with return water temperatures below 130°F, which would allow the use of condensing boilers.

4.6 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$195**	**$230**	**$50**	**$180**	**0.9**	**1,623**
ECM 8	Vending Machine Control	1,612	0.2	0	$195	$230	$50	$180	0.9	1,623

<u>ECM 8: Vending Machine Control</u>

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time and power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[4]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

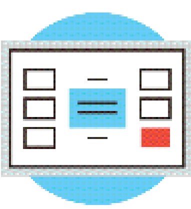
Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly.

Motor Maintenance

Motors have many moving parts. As these parts degrade over time, the efficiency of the motor is reduced. Routine maintenance prevents damage to motor components. Routine maintenance should include cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Thermostat Schedules and Temperature Resets



Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan, and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

Furnace Maintenance

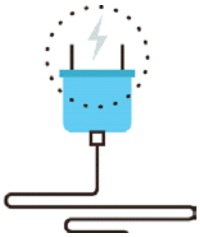
Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should: check for gas / carbon monoxide leaks; change the air and fuel filters; check components for cracks, corrosion, dirt, or debris build-up; ensure the ignition system is working properly; test and adjust operation and safety controls; inspect electrical connections; and lubricate motors and bearings.

Water Heater Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense™ website[6] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the Elementary School is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense™ products where available.

[5] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

[6] https://www.epa.gov/watersense

[7] https://www.epa.gov/watersense/watersense-work-0

6 ON-SITE GENERATION

You don’t have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the Elementary School’s electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for your facility. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

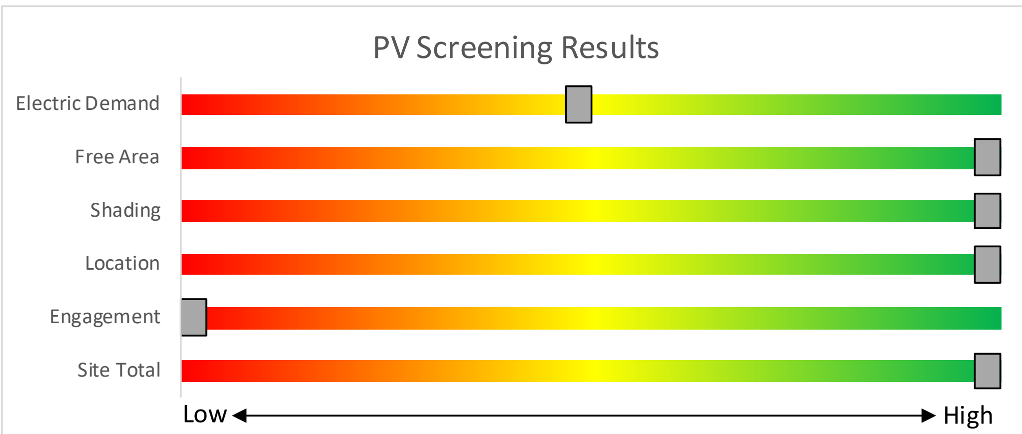
6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has **high** potential for installing a PV array.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high potential. A PV array located on the roof may be feasible. If you are interested in expanding the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the expansion PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	High	
System Potential	178	kW DC STC
Electric Generation	212,064	kWh/yr
Displaced Cost	$25,680	/yr
Installed Cost	$462,800	

Figure 9 - Photovoltaic Screening

Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

- **Basic Info on Solar PV in New Jersey**: www.njcleanenergy.com/whysolar
- **New Jersey Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the New Jersey Market**: www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

6.2 Combined Heat and Power

Combined heat and power (CHP) generate electricity at the Elementary School and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

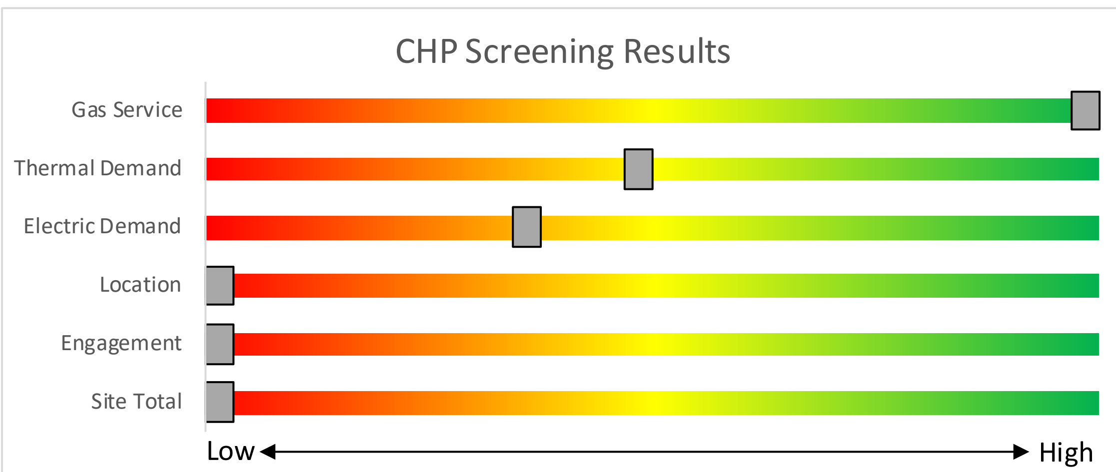
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has **no** potential for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. The lack of gas service, low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	None	
System Type	None	
System Potential	100	kW
Electric Generation	214,600	kWh/yr
Thermal Generation	1,255,410	MBtu/yr
Displaced Cost	$14,104	/yr
Installed Cost	$365,000	

Figure 10 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

7 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? Pick the program that works best for you. Incentive programs that may apply to this facility are identified in the Executive Summary. This section provides an overview of currently available New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.
Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.			

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at the Elementary School. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficient equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers	*Lighting Controls*
Electric Unitary HVAC	*Refrigeration Doors*
Gas Cooling	*Refrigeration Controls*
Gas Heating	*Refrigerator/Freezer Motors*
Gas Water Heating	*Food Service Equipment*
Ground Source Heat Pumps	*Variable Frequency Drives*
Lighting	

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where the Elementary School is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

The scope of work presented in this audit report does not quite meet the requirements of the current P4P program. However, due to the size of the facility and existing conditions, should additional measures be identified at a later point in time, for example through further evaluation or the Energy Savings Improvement Program process, this facility could potentially meet the requirements necessary to participate in the P4P program.

Incentives

Incentives are based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

Contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan, assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine	>3 MW	$350		
Fuel Cells with Heat Recovery				
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at: www.njcleanenergy.com/CHP.

7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the energy savings plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.6 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: [www.njcleanenergy.com/srec.](http://www.njcleanenergy.com/srec)

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for the Elementary School's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[8].

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier typically depends on whether a customer prefers budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

[8] www.state.nj.us/bpu/commercial/shopping.html

[9] www.state.nj.us/bpu/commercial/shopping.html

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.3	909	0	$108	$402	$110	2.7
Boiler room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Custodian lounge	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.2	526	0	$62	$453	$85	5.9
Kitchen office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	210	0	$25	$189	$40	6.0
Kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,277	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,277	0.1	248	0	$29	$110	$30	2.7
Kitchen	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.3	909	0	$108	$402	$110	2.7
Kitchen restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7
Serving line	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.2	631	0	$75	$489	$95	5.3
Custodian sink	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7
Cafeteria	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	165	0	$20	$73	$20	2.7
Cafeteria	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.1	413	0	$49	$183	$50	2.7
Cafeteria	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Café mech room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.1	331	0	$39	$146	$40	2.7
MPR	24	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,571	2	Relamp	No	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,571	1.0	2,323	0	$276	$1,753	$480	4.6
MPR	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MPR stage	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,277	2, 3	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,571	0.6	2,224	0	$264	$1,146	$275	3.3
Music room stage	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.2	827	0	$98	$365	$100	2.7
Music room stage	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.2	827	0	$98	$365	$100	2.7
Music room stage	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Music storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	276	0.1	37	0	$4	$189	$20	38.5
MPR storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	276	0.1	37	0	$4	$189	$20	38.5
MPR office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	210	0	$25	$189	$40	6.0
MPR storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	400	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	276	0.1	83	0	$10	$280	$45	23.8
Hall by cafeteria	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	165	0	$20	$73	$20	2.7
Hall by cafeteria	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Hall by gym	15	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 4	Relamp	Yes	15	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	1,571	0.3	1,010	0	$120	$1,265	$30	10.3
Music Room 1	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	342	0	$41	$219	$60	3.9
Music Room 1	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,277	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.1	473	0	$56	$280	$65	3.8
Tech office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,277	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,277	0.0	124	0	$15	$55	$15	2.7
Book storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	276	0.1	55	0	$7	$226	$30	29.7
Boys restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	421	0	$50	$416	$75	6.8
Girls restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	421	0	$50	$416	$75	6.8
Hall by restroom	8	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 4	Relamp	Yes	8	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	1,571	0.2	539	0	$64	$660	$16	10.1
Main entrance	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	165	0	$20	$73	$20	2.7
Main entrance	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main lobby	18	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 3	Relamp	Yes	18	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.3	1,212	0	$144	$1,518	$106	9.8
Main lobby	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main office	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	941	0	$112	$602	$165	3.9
Conference room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.1	171	0	$20	$110	$30	3.9
Work room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.1	171	0	$20	$110	$30	3.9
Office 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.1	171	0	$20	$110	$30	3.9
Principal office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.1	171	0	$20	$110	$30	3.9
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.0	29	0	$3	$73	$20	15.4
MO restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.0	57	0	$7	$37	$10	3.9
Teachers lounge	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.2	513	0	$61	$329	$90	3.9
Teachers lounge	5	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	5	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.1	135	0	$16	$272	$10	16.3
Men's faculty	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.0	57	0	$7	$37	$10	3.9
Women's faculty	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.0	57	0	$7	$37	$10	3.9
Nurse's office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	285	0	$34	$183	$50	3.9
Nurse's office	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,571	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,571	0.0	111	0	$13	$130	$24	8.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	**Fixture Quantity**	**Fixture Description**	**Control System**	**Light Level**	**Watts per Fixture**	**Annual Operating Hours**	**ECM #**	**Fixture Recommendation**	**Add Controls?**	**Fixture Quantity**	**Fixture Description**	**Control System**	**Watts per Fixture**	**Annual Operating Hours**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Total Installation Cost**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.0	57	0	$7	$37	$10	3.9
Nurse Exam room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.0	114	0	$14	$73	$20	3.9
Nurse storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.0	15	0	$2	$37	$10	15.4
Elevator machine room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	400	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	400	0.0	15	0	$2	$37	$10	15.4
Elevator machine room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	400	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	None	29	400	0.0	29	0	$3	$73	$20	15.4
Hall by Nurse office	14	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 4	Relamp	Yes	14	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	1,571	0.3	943	0	$112	$993	$28	8.6
Network room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	316	0	$37	$226	$50	4.7
500 A SGI	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.2	428	0	$51	$274	$75	3.9
Girls restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.2	526	0	$62	$453	$85	5.9
Custodian closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.0	15	0	$2	$37	$10	15.4
Boys restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.2	526	0	$62	$453	$85	5.9
500 B SGI	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.2	428	0	$51	$274	$75	3.9
Behaviour room 5000	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.1	171	0	$20	$110	$30	3.9
Hall by 500/502	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,571	0.1	421	0	$50	$371	$40	6.6
Hall by 500/502	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,277	2, 4	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,571	0.1	331	0	$39	$335	$30	7.8
502 Pre-K room	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.5	1,112	0	$132	$712	$195	3.9
502 Pre-K room	7	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	7	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.1	189	0	$22	$381	$14	16.3
502 Pre-K room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
502 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7
501 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
501 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
504 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
504 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
503 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
503 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
503 CR	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
503 Kiln room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,277	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,277	0.0	124	0	$15	$55	$15	2.7
503 A storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	276	0.1	37	0	$4	$189	$20	38.5
505 A class	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,277	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.1	316	0	$37	$226	$50	4.7
Hall by 505A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,571	0.1	316	0	$37	$226	$30	5.2
506 Pre-K room	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.5	1,112	0	$132	$712	$195	3.9
506 Pre-K room	7	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	7	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.1	189	0	$22	$381	$14	16.3
506 Pre-K room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
506 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7
508 Pre-K room	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.5	1,112	0	$132	$712	$195	3.9
508 Pre-K room	7	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	7	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.1	189	0	$22	$381	$14	16.3
508 Pre-K room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
508 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7
505 CR	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.9	2,053	0	$244	$1,315	$360	3.9
505 CR	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
507 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
507 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
510 A split room	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
509 A split room	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
Hall by 509/510	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,571	0.2	526	0	$62	$408	$50	5.7
Hall by 509/510	8	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 4	Relamp	Yes	8	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	1,571	0.2	539	0	$64	$660	$16	10.1
Hall by 509/510	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,277	2, 4	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,571	0.1	441	0	$52	$371	$40	6.3
512 Pre-K	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.3	741	0	$88	$475	$130	3.9
512 Pre-K	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,571	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,571	0.0	28	0	$3	$33	$6	8.1
512 restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
511 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.4	855	0	$102	$548	$150	3.9
514 Pre-K	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.4	855	0	$102	$548	$150	3.9
514 Pre-K	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
513 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.4	855	0	$102	$548	$150	3.9
Women's restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	316	0	$37	$380	$65	8.4
Women restroom	1	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2	Relamp	No	1	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	2,277	0.0	39	0	$5	$54	$2	11.3
DHW room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.0	15	0	$2	$37	$10	15.4
Electric room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.0	15	0	$2	$37	$10	15.4
Men's restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	316	0	$37	$380	$65	8.4
515 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.4	855	0	$102	$548	$150	3.9
516 CR	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.2	513	0	$61	$329	$90	3.9
Hall by electrical closet	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,571	0.2	736	0	$87	$481	$70	4.7
Hall by electrical closet	6	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 4	Relamp	Yes	6	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	1,571	0.1	404	0	$48	$551	$12	11.2
Hall by electrical closet	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Back stair	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.2	661	0	$79	$292	$80	2.7
Back stair	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairwell 3	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.2	579	0	$69	$256	$70	2.7
Stairwell 3	2	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2	Relamp	No	2	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	2,277	0.0	78	0	$9	$109	$4	11.3
Stairwell 3	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairwell 2	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.2	579	0	$69	$256	$70	2.7
Stairwell 2	2	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2	Relamp	No	2	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	2,277	0.0	78	0	$9	$109	$4	11.3
Stairwell 2	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
10 Vestibule	2	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2	Relamp	No	2	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	2,277	0.0	78	0	$9	$109	$4	11.3
Stairwell 1	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.2	579	0	$69	$256	$70	2.7
Stairwell 1	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Library men room	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.3	1,157	0	$137	$672	$145	3.8
Library	40	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,277	2, 3	Relamp	Yes	40	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,571	2.1	7,412	-2	$881	$3,461	$870	2.9
Library	1	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2	Relamp	No	1	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	2,277	0.0	39	0	$5	$54	$2	11.3
Library	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Library computer lab	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	210	0	$25	$189	$40	6.0
Library computer lab	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,277	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.1	316	0	$37	$226	$50	4.7
Library office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.2	513	0	$61	$329	$90	3.9
Library vestibule	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.1	248	0	$29	$110	$30	2.7
Mech room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.2	131	0	$16	$329	$90	15.4
Men's faculty	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7
Women's faculty	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7
600 A class	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,277	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,420	0	$169	$763	$170	3.5
600B storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	276	0.1	37	0	$4	$189	$20	38.5
600 CR	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.3	770	0	$92	$493	$135	3.9
600 CR	1	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	1	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	27	0	$3	$54	$2	16.3
Hall by library	8	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 4	Relamp	Yes	8	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	1,571	0.2	539	0	$64	$660	$16	10.1
Hall by library	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,571	0.2	526	0	$62	$408	$50	5.7
Hall by library	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
601 A CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
Electrical closet	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.1	44	0	$5	$110	$30	15.4
Girls 2nd floor	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.2	526	0	$62	$453	$85	5.9
Custodian 2nd floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,277	0.0	83	0	$10	$37	$10	2.7
Boys 2nd floor	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.2	526	0	$62	$453	$85	5.9
602 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
602 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
603 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
603 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
604 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
604 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
605 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
605 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
Hall by 602	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,277	2, 4	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,571	0.1	331	0	$39	$335	$30	7.8
Hall by 602	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,571	0.1	421	0	$50	$371	$40	6.6
606 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
606 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
607 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
607 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
608 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
608 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
609 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
609 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
610 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
610 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
611 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,571	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,571	0.4	1,027	0	$122	$657	$180	3.9
611 CR	3	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	52	1,571	2	Relamp	No	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	81	0	$10	$163	$6	16.3
Hall by 610	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,571	0.2	526	0	$62	$408	$50	5.7
Hall by 610	2	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 4	Relamp	Yes	2	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	1,571	0.0	135	0	$16	$334	$4	20.6
Hall by 610	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,277	2, 4	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,571	0.1	441	0	$52	$371	$40	6.3
Hall by 610	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
612 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.4	855	0	$102	$548	$150	3.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
613 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.4	855	0	$102	$548	$150	3.9
CR 614	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.4	855	0	$102	$548	$150	3.9
CR 615	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,571	2	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.4	855	0	$102	$548	$150	3.9
Women 2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	316	0	$37	$380	$65	8.4
Women 2nd floor	1	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 3	Relamp	Yes	1	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	67	0	$8	$54	$2	6.5
Electrical room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	400	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	400	0.0	29	0	$3	$73	$20	15.4
Men 2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.1	316	0	$37	$380	$65	8.4
Men 2nd floor	1	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 3	Relamp	Yes	1	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	1,571	0.0	67	0	$8	$54	$2	6.5
617 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.5	1,578	0	$187	$818	$185	3.4
616 SGI	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,571	0.3	947	0	$112	$599	$125	4.2
Hall by 614	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,277	2, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,571	0.2	736	0	$87	$481	$70	4.7
Hall by 614	6	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	2,277	2, 4	Relamp	Yes	6	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	1,571	0.1	404	0	$48	$551	$12	11.2
Hall by 614	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Front door canopy	6	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch		52	2,277	2	Relamp	No	6	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	2,277	0.0	213	0	$26	$326	$12	12.2
Front door canopy	5	Compact Fluorescent: Circular fluorescent	Timeclock		52	5,110	2	Relamp	No	5	LED Lamps: 4 pin - 2 lamps	Timeclock	36	5,110	0.0	399	0	$48	$272	$10	5.4
Wall pack	10	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		42	5,110		None	No	10	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	42	5,110	0.0	0	0	$0	$0	$0	0.0
Wall mounted	3	Metal Halide: (1) 70W Lamp	Timeclock		95	5,110	1	Fixture Replacement	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	29	5,110	0.1	1,019	0	$123	$2,898	$300	21.0
Wall mounted	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		57	5,110		None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	57	5,110	0.0	0	0	$0	$0	$0	0.0
Wall pack	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		42	4,380		None	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	42	4,380	0.0	0	0	$0	$0	$0	0.0
Wall mounted	1	Compact Fluorescent: 4 pin - 1 lamp	Other		26	2,000	2	Relamp	No	1	LED Lamps: 4 pin - 2 lamps	Other	18	2,000	0.0	16	0	$2	$54	$2	27.7
Parking pole	28	Metal Halide: (1) 70W Lamp	Timeclock		95	5,110	1	Fixture Replacement	No	28	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	29	5,110	0.9	9,515	0	$1,152	$26,056	$2,800	20.2

Motor Inventory & Recommendations

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	AHU-1 Classrooms	1	Supply Fan	15.0	90.0%	No	W	2,745	5	No	93.0%	Yes	1	4.5	13,542	0	$1,640	$7,041	$1,200	3.6
Roof	RTU-1 toilet rooms	1	Supply Fan	7.5	89.0%	No	W	2,745	5	No	91.0%	Yes	1	2.2	6,727	0	$815	$4,738	$600	5.1
Roof	AHU-1 classrooms	1	Exhaust Fan	15.0	90.0%	No	W	2,745	5	No	93.0%	Yes	1	4.7	13,542	0	$1,640	$7,041	$1,200	3.6
Roof	RTU-1 toilet rooms	1	Exhaust Fan	7.5	89.0%	No	W	2,745	5	No	91.0%	Yes	1	2.3	6,727	0	$815	$4,738	$600	5.1
Roof	Pre-1	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-1	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-2	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-3	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-4	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-5	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-6	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-7	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-8	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pre-9	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-1	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-2	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-3	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-4	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-5	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-6	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	RTH-7	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-8	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-9	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTH-10	1	Exhaust Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mech room 103	UH-1	1	Supply Fan	0.1	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Vestibule 100	UH-2	1	Supply Fan	0.1	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mech room 103	P-3,4	2	Heating Hot Water Pump	5.0	90.2%	Yes	W	2,745		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
Mech room 103	OCW boosters	2	Water Supply Pump	1.5	80.0%	No	W	2,745		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Mech room 103	DHW boosters	3	Water Supply Pump	0.0	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Outdoor	Cooling tower	1	Cooling Tower Fan	7.5	89.5%	Yes	W	3,391		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HRU-1	1	Exhaust Fan	2.0	86.5%	Yes	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HRU-1	1	Supply Fan	1.5	86.5%	Yes	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HRU-2	1	Exhaust Fan	2.0	86.5%	Yes	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HRU-2	1	Supply Fan	1.5	86.5%	Yes	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Lower roof	HRU-3	1	Exhaust Fan	0.8	86.5%	Yes	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Lower roof	HRU-3	1	Supply Fan	0.8	86.5%	Yes	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Elevator machine	Hydraulic pump	1	Process Pump	30.0	74.0%	No	W	200		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
DHW water room	DHW boosters	1	Water Supply Pump	0.1	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mech room 103	Boiler combustion fan	2	Combustion Air Fan	2.0	86.5%	No	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Mech room 103	P-5,6	2	Water-Source Heat Pump Circulation Pump	40.0	94.5%	Yes	W	1,750		No	94.5%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mech room 103	P-1,2	2	Heating Hot Water Pump	2.0	82.0%	Yes	W	2,745		No	82.0%	No		0.0	0	0	$0	$0	$0	0.0
Ceiling	WSHP	46	Supply Fan	1.5	86.0%	No	B	2,745		No	86.0%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classrooms/Office Ceilings	Corridor 101	1	Water Source HP	1.82	26.80	B	6	Yes	1	Water Source HP	1.82	26.80	14.00	4.80	0.2	421	0	$51	$5,050	$147	96.1
Classrooms/Office Ceilings	Corridor 102 area A	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Corridor 102 area B	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Cafeteria	1	Water Source HP	8.92	129.00	B	6	Yes	1	Water Source HP	8.92	129.00	14.00	4.50	0.7	1,682	0	$204	$11,018	$722	50.5
Classrooms/Office Ceilings	Faculty 108	1	Water Source HP	1.82	26.80	B	6	Yes	1	Water Source HP	1.82	26.80	14.00	4.80	0.2	421	0	$51	$5,050	$147	96.1
Classrooms/Office Ceilings	Kitchen 107	1	Water Source HP	4.57	66.20	B	6	Yes	1	Water Source HP	4.57	66.20	14.00	4.80	0.5	1,259	0	$152	$12,694	$370	80.8
Classrooms/Office Ceilings	Multipurpose 109B	1	Water Source HP	13.50	21.40	B	6	Yes	1	Water Source HP	13.50	21.40	14.00	4.50	1.9	2,335	0	$283	$16,681	$1,094	55.1
Classrooms/Office Ceilings	Multipurpose	1	Water Source HP	13.50	21.40	B	6	Yes	1	Water Source HP	13.50	21.40	14.00	4.50	1.9	2,335	0	$283	$16,681	$1,094	55.1
Classrooms/Office Ceilings	EC112	1	Water Source HP	1.46	21.60	B	6	Yes	1	Water Source HP	1.46	21.60	14.00	4.80	0.2	422	0	$51	$4,054	$118	77.1
Classrooms/Office Ceilings	Platform 109C	1	Water Source HP	2.68	39.10	B	6	Yes	1	Water Source HP	2.68	39.10	14.00	4.80	0.2	593	0	$72	$7,435	$217	100.5
Classrooms/Office Ceilings	117	1	Water Source HP	1.82	26.80	B	6	Yes	1	Water Source HP	1.82	26.80	14.00	4.80	0.2	421	0	$51	$5,050	$147	96.1
Classrooms/Office Ceilings	11B, 117C, 117D, 117F	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 120	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Kindergarten 120	1	Water Source HP	3.55	49.10	B	6	Yes	1	Water Source HP	3.55	49.10	14.00	4.80	0.2	588	0	$71	$9,868	$288	134.5
Classrooms/Office Ceilings	Classroom 122	1	Water Source HP	3.55	49.10	B	6	Yes	1	Water Source HP	3.55	49.10	14.00	4.80	0.2	588	0	$71	$9,868	$288	134.5
Classrooms/Office Ceilings	Nurse 123	1	Water Source HP	2.29	31.20	B	6	Yes	1	Water Source HP	2.29	31.20	14.00	4.80	0.1	412	0	$50	$6,370	$186	124.1
Classrooms/Office Ceilings	Kindergarten 124	1	Water Source HP	3.55	49.10	B	6	Yes	1	Water Source HP	3.55	49.10	14.00	4.80	0.2	588	0	$71	$9,868	$288	134.5
Classrooms/Office Ceilings	Classroom 126	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Kindergarten 126	1	Water Source HP	3.55	49.10	B	6	Yes	1	Water Source HP	3.55	49.10	14.00	4.80	0.2	588	0	$71	$9,868	$288	134.5
Classrooms/Office Ceilings	BDI,SGI, 128	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classrooms/Office Ceilings	Guidance	1	Water Source HP	0.90	129.00	B	6	Yes	1	Water Source HP	0.90	129.00	14.00	4.80	0.1	1,232	0	$149	$2,502	$73	16.3
Classrooms/Office Ceilings	CSTI 31, Conference 131A	1	Water Source HP	1.46	21.60	B	6	Yes	1	Water Source HP	1.46	21.60	14.00	4.80	0.2	422	0	$51	$4,054	$118	77.1
Classrooms/Office Ceilings	Classroom 133	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Art room 135	1	Water Source HP	3.55	49.10	B	6	Yes	1	Water Source HP	3.55	49.10	14.00	4.80	0.2	588	0	$71	$9,868	$288	134.5
Classrooms/Office Ceilings	Network 137	1	Water Source HP	1.82	26.80	B	6	Yes	1	Water Source HP	1.82	26.80	14.00	4.80	0.2	421	0	$51	$5,050	$147	96.1
Classrooms/Office Ceilings	Technology 139	1	Water Source HP	3.55	49.10	B	6	Yes	1	Water Source HP	3.55	49.10	14.00	4.80	0.2	588	0	$71	$9,868	$288	134.5
Classrooms/Office Ceilings	Classroom 141,143A	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Research 143	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Corridor 200 area A	1	Water Source HP	2.29	31.20	B	6	Yes	1	Water Source HP	2.29	31.20	14.00	4.80	0.1	412	0	$50	$6,370	$186	124.1
Classrooms/Office Ceilings	Corridor 200 area B	1	Water Source HP	2.29	31.20	B	6	Yes	1	Water Source HP	2.29	31.20	14.00	4.80	0.1	412	0	$50	$6,370	$186	124.1
Classrooms/Office Ceilings	Media center 201	1	Water Source HP	8.92	129.00	B	6	Yes	1	Water Source HP	8.92	129.00	14.00	4.50	0.7	1,682	0	$204	$11,018	$722	50.5
Classrooms/Office Ceilings	Workroom	1	Water Source HP	1.82	26.80	B	6	Yes	1	Water Source HP	1.82	26.80	14.00	4.80	0.2	421	0	$51	$5,050	$147	96.1
Classrooms/Office Ceilings	SE 204	1	Water Source HP	2.29	31.20	B	6	Yes	1	Water Source HP	2.29	31.20	14.00	4.80	0.1	412	0	$50	$6,370	$186	124.1
Classrooms/Office Ceilings	EC 208	1	Water Source HP	1.82	26.80	B	6	Yes	1	Water Source HP	1.82	26.80	14.00	4.80	0.2	421	0	$51	$5,050	$147	96.1
Classrooms/Office Ceilings	SGI 209	1	Water Source HP	1.82	26.80	B	6	Yes	1	Water Source HP	1.82	26.80	14.00	4.80	0.2	421	0	$51	$5,050	$147	96.1
Classrooms/Office Ceilings	BSI 209A	1	Water Source HP	1.82	26.80	B	6	Yes	1	Water Source HP	1.82	26.80	14.00	4.80	0.2	421	0	$51	$5,050	$147	96.1
Classrooms/Office Ceilings	Classroom 211	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 213	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 215	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 216	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classrooms/Office Ceilings	Classroom 217	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 218	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 219	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 220	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 222	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9
Classrooms/Office Ceilings	Classroom 224	1	Water Source HP	2.65	39.10	B	6	Yes	1	Water Source HP	2.65	39.10	14.00	4.80	0.2	591	0	$72	$7,366	$215	99.9

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mech 103	Boilers - 1,2 - Old section	2	Non-Condensing Hot Water Boiler	2,845.00	B	7	Yes	2	Condensing Hot Water Boiler	2,845.00	93.00%	Ec	0.0	0	73	$794	$105,885	$11,380	119.0
Mech 103	Boilers - 3,4 New section	2	Condensing Hot Water Boiler	1,694.00	W		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Old section	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
DHW closet	New section	1	Storage Tank Water Heater (≤ 50 Gal)			No						0.0	0	0	$0	$0	$0	0.0

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)		No	No	No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Medium Temp Freezer (0F to 30F)		No	No	No	0.0	0	0	$0	$0	$0	0.0

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Refrigerator Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Refrigerator Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Freezer Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Gas Convection Oven (Half Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Steamer	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Griddle (≤2 Feet Width)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	3	Insulated Food Holding Cabinet (1/2 Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Robert LHES	113	Desktop	145.0	Yes
Robert LHES	21	Chrome book cart	40.0	Yes
Robert LHES	2	Server	1,200.0	Yes
Robert LHES	34	Printer - small	60.0	Yes
Robert LHES	3	Printer - medium	80.0	Yes
Robert LHES	6	Printer - large	200.0	Yes
Robert LHES	27	Projector	400.0	Yes
Robert LHES	5	Microwave	900.0	Yes
Robert LHES	1	Refrigerator - small	70.0	Yes
Robert LHES	1	Refrigerator - medium	90.0	Yes
Robert LHES	2	Refrigerator - large	220.0	Yes
Robert LHES	2	Coffee machine	400.0	Yes
Robert LHES	2	Television - Plasma	130.0	Yes
Robert LHES	1	Television - LED	100.0	Yes
Robert LHES	27	Smart boards	5.0	Yes
Robert LHES	1	Kiln	11,520.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Faculty lounge	1	Refrigerated	8	Yes	0.2	1,612	0	$195	$230	$50	0.9

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

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ENERGY STAR® Statement of Energy Performance

53

ENERGY STAR® Score[1]

Robert L Horbelt Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 80,586
Built: 2001

For Year Ending: January 31, 2019
Date Generated: July 13, 2019

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Robert L Horbelt Elementary School
104 Burr Street
Barnegat, New Jersey 08005

Property Owner
Barnegat Township School District
550 BARENGAT BLVD. NORTH
Barnegat, NJ 08005
(____)____-______

Primary Contact
Stephen Brennan
550 BARENGAT BLVD. NORTH
Barnegat, NJ 08005
609-698-5800
SBRENNAN@BARNEGATSCHOOLS.COI

Property ID: 7071878

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
51.8 kBtu/ft²

Source EUI
112.4 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	1,507,863 (36%)
Electric - Grid (kBtu)	2,669,190 (64%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	53.8
National Median Source EUI (kBtu/ft²)	116.5
% Diff from National Median Source EUI	-4%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	350

Signature & Stamp of Verifying Professional

I __________________ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: ________________________ Date: ____________

Licensed Professional

____ _________
,
(____)____-______
____

Professional Engineer Stamp
(if applicable)

Appendix C: Glossary

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gas* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.
gpf	*Gallons per flush*

gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp.
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units.
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp.
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp.
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge.
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense™	The symbol for water efficiency. The WaterSense™ program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.

Local Government Energy Audit Report

Joseph T. Donahue Elementary School

October 31, 2019

Prepared for:
Barnegat Township School District
200 Bengal Blvd
Barnegat, New Jersey 08005

Prepared by:
TRC
900 Route 9 North
Woodbridge, New Jersey 07095

Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC Companies, Inc. reviewed the energy conservation measures and estimates of energy savings were reviewed for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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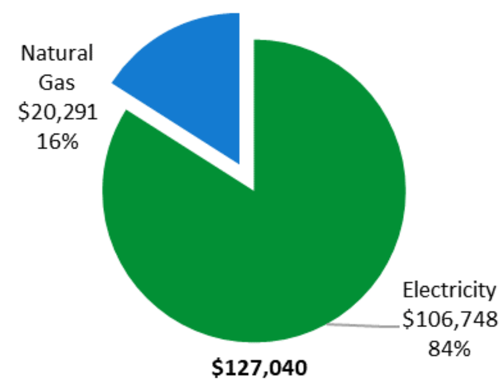
Table of Contents

1 Executive Summary

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Joseph T. Donahue Elementary School. This report provides you with information about the Elementary School's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in the Elementary School. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $127,040 Electricity: 909,106 kWh Natural Gas: 19,672 Therms



ENERGY STAR® Benchmarking Score	32 *(1-100 scale)*	This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

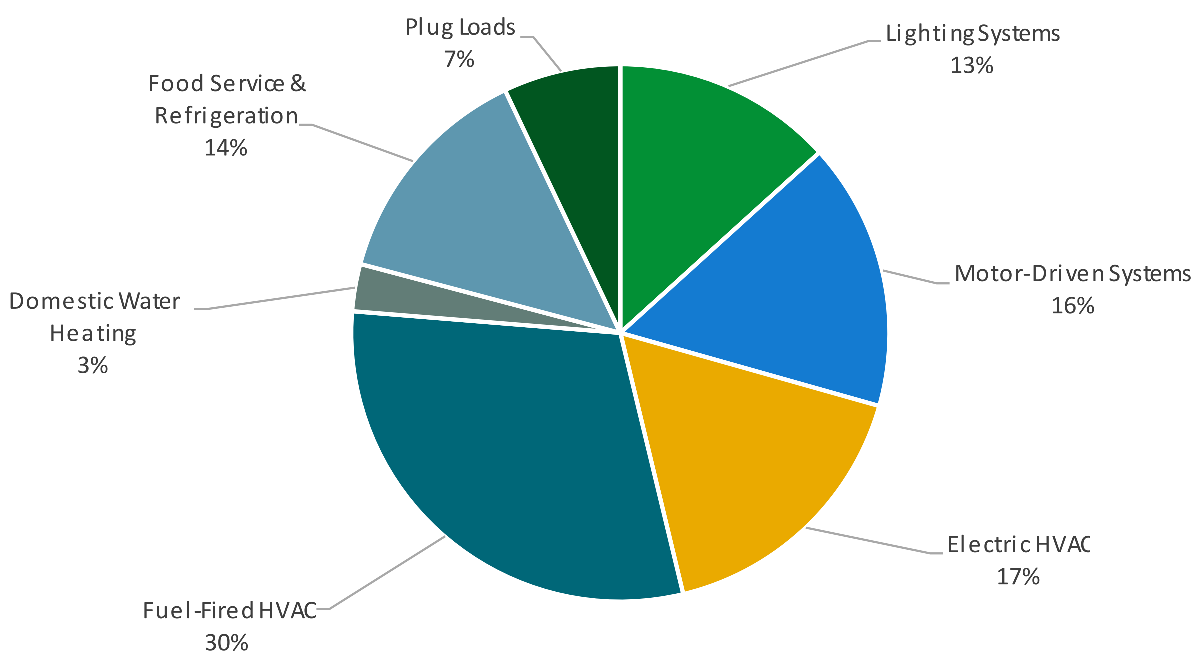


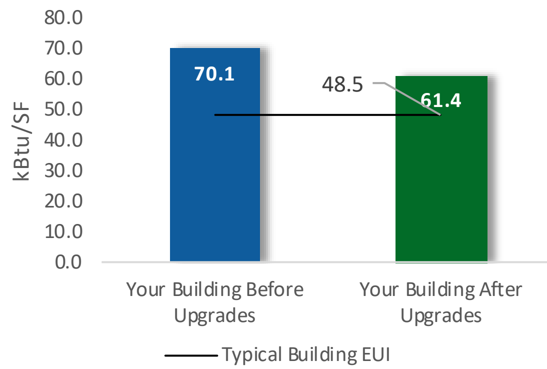
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

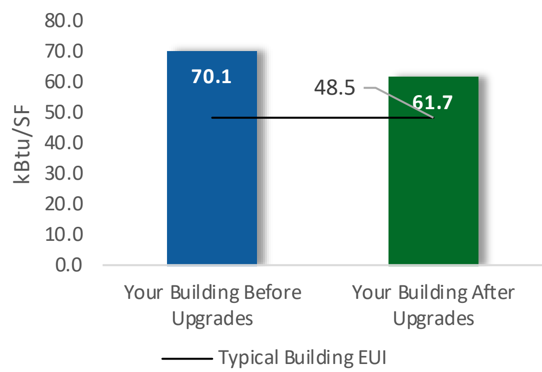
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$141,423
Potential Rebates & Incentives[1]	$18,600
Annual Cost Savings	$20,523
Annual Energy Savings	Electricity: 170,654 kWh Natural Gas: 470 Therms
Greenhouse Gas Emission Savings	89 Tons
Simple Payback	6.0 Years
Site Energy Savings (all utilities)	12%



Scenario 2: Cost Effective Package[2]

Installation Cost	$129,922
Potential Rebates & Incentives	$18,202
Annual Cost Savings	$20,322
Annual Energy Savings	Electricity: 170,654 kWh Natural Gas: 274 Therms
Greenhouse Gas Emission Savings	88 Tons
Simple Payback	5.5 Years
Site Energy Savings (all utilities)	12%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	*Cost effective?*	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**111,678**	**26.3**	**-14**	**$12,970**	**$83,436**	**$13,772**	**$69,664**	**5.4**	**110,827**
ECM 1	Install LED Fixtures	Yes	43,500	5.0	0	$5,108	$48,298	$5,000	$43,298	8.5	43,805
ECM 2	Retrofit Fixtures with LED Lamps	Yes	68,178	21.4	-14	$7,862	$35,138	$8,772	$26,366	3.4	67,023
Lighting Control Measures			**6,290**	**1.6**	**-1**	**$725**	**$4,360**	**$570**	**$3,790**	**5.2**	**6,180**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	6,290	1.6	-1	$725	$4,360	$570	$3,790	5.2	6,180
Variable Frequency Drive (VFD) Measures			**49,462**	**14.0**	**0**	**$5,808**	**$41,559**	**$3,760**	**$37,799**	**6.5**	**49,808**
ECM 4	Install VFDs on Constant Volume (CV) Fans	Yes	49,462	14.0	0	$5,808	$41,559	$3,760	$37,799	6.5	49,808
Domestic Water Heating Upgrade			**0**	**0.0**	**62**	**$642**	**$11,608**	**$398**	**$11,210**	**17.5**	**7,291**
ECM 5	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	20	$202	$11,500	$398	$11,102	55.0	2,291
ECM 6	Install Low-Flow DHW Devices	Yes	0	0.0	43	$440	$108	$0	$108	0.2	5,000
Food Service & Refrigeration Measures			**3,224**	**0.4**	**0**	**$379**	**$460**	**$100**	**$360**	**1.0**	**3,246**
ECM 7	Vending Machine Control	Yes	3,224	0.4	0	$379	$460	$100	$360	1.0	3,246
TOTALS (COST EFFECTIVE MEASURES)			**170,654**	**42.3**	**27**	**$20,322**	**$129,922**	**$18,202**	**$111,720**	**5.5**	**175,061**
TOTALS (ALL MEASURES)			**170,654**	**42.3**	**47**	**$20,523**	**$141,423**	**$18,600**	**$122,823**	**6.0**	**177,352**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	x	x	x
ECM 2	Retrofit Fixtures with LED Lamps	x	x	x
ECM 3	Install Occupancy Sensor Lighting Controls	x	x	x
ECM 4	Install VFDs on Constant Volume (CV) HVAC	x	x	x
ECM 5	Install High Efficiency Gas Water Heater		x	x
ECM 6	Install Low-Flow Domestic Hot Water Devices	x	x	x
ECM 7	Vending Machine Control	x	x	x

Figure 3 – Funding Options

New Jersey's Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Joseph T. Donahue Elementary School. This report provides information on how the Elementary School uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see **Appendix A: Equipment Inventory & Recommendations.**

2.1 Site Overview

On July 5, 2019, TRC performed an energy audit at Joseph T. Donahue Elementary School located in Barnegat, New Jersey. TRC met with Neil Piro to review the facility operations and help focus our investigation on specific energy-using systems.

Joseph T. Donahue Elementary School is a one-story, 72,300 square foot building built in 2008. Spaces include: classrooms, a gymnasium, offices, a cafeteria, corridors, a sanctuary, offices, a kitchen, and mechanical space.

The building has onsite generation with solar PV and is 100% heated and cooled.

2.2 Building Occupancy

The Elementary School is occupied from September through June. Typical weekday occupancy is 80 staff and 947 students.

Building Name	Weekday/Weekend	Operating Schedule
Joseph T. Donahue Elementary School	Weekday	7:30 AM - 5:00 PM
	Weekend	Saturday: 8:00 AM - 2:00 PM (gym only) Sunday: 8:30 AM - 12:30 PM (cafeteria and gym)

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a concrete and brick facade. The dividing walls are constructed from concrete masonry units. The roof is built-up, flat, and covered with black EPDM membrane. It is in good condition.

All windows are double-glazed with aluminum frames and a thermal break. The glass-to-frame seals are in good condition. Exterior doors have aluminum frames and are in good condition with undamaged door seals.

Roof

External Facade

Windows

Exterior Door

2.4 Lighting Systems

The primary interior lighting system uses T8 linear tube fixtures, 60-watt incandescent lamps and 26-watt 4-pin compact fluorescent lamps. Fixture types include 2- or 3-lamp 4-foot long troffers and surface-mounted fixtures.

The gymnasium has T5 high-output high bay fixtures that are controlled using occupancy sensors. The interior fixtures in the school are controlled by occupancy sensors and wall switches. All exit signs are LED units.

Interior lighting levels were generally sufficient. Most fixtures are in good condition.

Exterior lighting is provided by wall-mounted 70-watt metal halide and 57-watt LED fixtures. Wall sconces contain 26-watt 4-pin compact fluorescent lamps. The parking lot contains 400-watt metal halide pole fixtures that are controlled using timeclock and photocells.

Pole Fixtures

4-pin CFL Fixtures

Linear T8 Troffers

Ceiling-mounted Fixtures

2.5 Air Handling Systems

Heat pump units

The building is mainly conditioned by 57 distributed water source heat pumps with cooling capacities ranging from 1.5- to 3-tons and heating capacities ranging from 10 to 36 MBh. Ground water is distributed to the heat pumps by two variable speed 10 hp circulation pumps. The boiler provides supplemental hot water to the loop when needed. The heat pump units have fractional horsepower supply fans and an average EER rating of 12. There are several energy recovery units on the roof with supply and return fans of various capacities.

Space temperatures in the zones, as well as loop temperatures, are controlled using an EMS. The units are within their useful life.

Energy Recovery Units

Water Source Heat Pump

2.6 Heating Hot Water Systems

Two Aerco condensing hot water boilers serve the heat pump loop. The boilers have an output capacity of 1760 MBH with a name plate efficiency of 88%.

Ground water is circulated to the boilers where it is heated as required, and then distributed using two variable speed 15 hp pumps (located in the boiler room) to heat pumps located in various sections of the school.

Space and loop temperatures are controlled using the Building Energy Management System (EMS). A roof-mounted cooling tower with a variable speed 10 hp fan helps regulate the loop temperature.

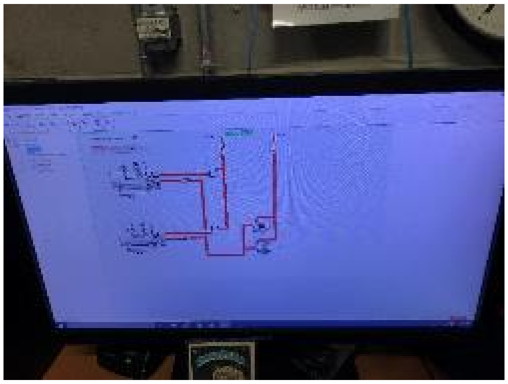
Various spaces of the school are heated using 7.5 kW electric resistance heaters. The condensing boilers serving the newer section were installed in the year 2007 and are within their useful life.

Condensing Boilers

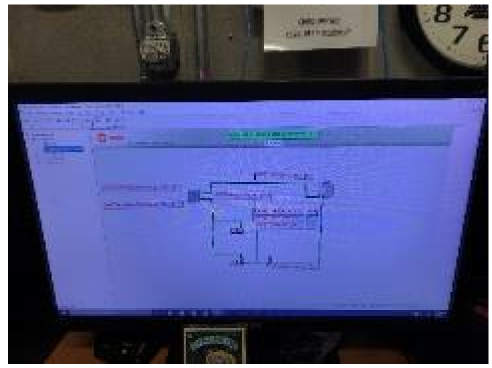
Heating Hot Water Pumps

2.7 Building Energy Management Systems (EMS)

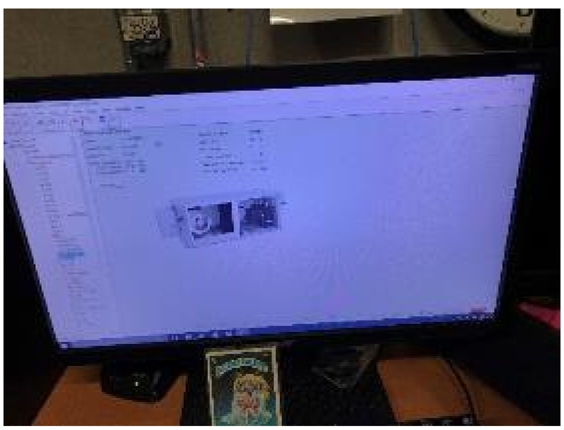
A Trane EMS controls the HVAC equipment, boilers, air handlers, pumps, and energy recovery units. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, humidity, heating water loop temperatures, and chilled water loop temperatures.



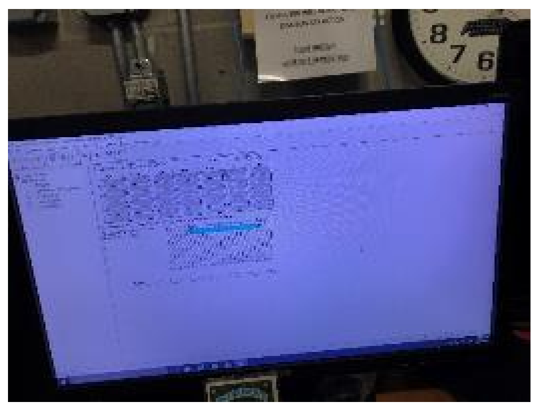
Boilers



Heat Pump Supply



Energy Recovery Unit



Scheduling

2.8 Domestic Hot Water

One gas-fired PVI water heater serves the domestic hot water needs of the Elementary School. This unit has an input capacity of 199 MBh and a tank capacity of 175 gallons and is 80% efficient. The unit was installed in 2008 and has been evaluated for replacement.

Hot water is distributed to the end uses using fractional horse power circulating pump.

DHW

Circulation Pump

2.9 Food Service and Refrigeration Equipment

The kitchen has a mix of gas and electric equipment, including gas convection oven, gas burners, steamer, steam tables, and a griddle, that is used to prepare meals for students. Most cooking is done using a convection gas-fired oven. Bulk prepared foods are held in several electric holding cabinets. Equipment is high-efficiency and in good condition.

The kitchen has several stand-up solid door refrigerators. There are also refrigerator and freezer chests. All equipment is standard efficiency and appears to be in good condition.

The walk-in refrigerator has an estimated 2-ton compressor and a two-fan evaporator. The walk-in medium temperature freezer has an approximately 2.5-ton compressor and a four-fan evaporator with defrost controls.

Walk-in Refrigerator

Oven and Steamer

Gas Stove

Steam Tables

2.10 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 7% percent of total building energy use. This is higher than a typical building.

You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area, as well as Energy Efficient Best Practices.

There are approximately 133 computer work stations throughout the Elementary School. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as Smart Boards, projectors, and fans. There are several residential-style refrigerators throughout the building that are used to store food for the staff. These vary in condition and efficiency.

2.11 Water-Using Systems

Faucet flow rates are at 1.5 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

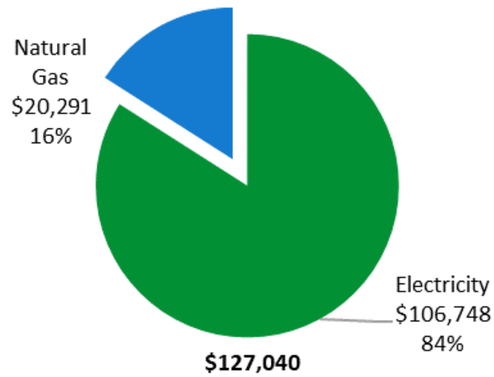
2.12 On-Site Generation

Joseph T. Donahue Elementary School has a photovoltaic (PV) array with panels that was installed in 2011. This system provides approximately 32% of the electricity used at the Elementary School.

3 Energy Use and Costs

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	909,106 kWh	$106,748
Natural Gas	19,672 Therms	$20,291
Total		**$127,040**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

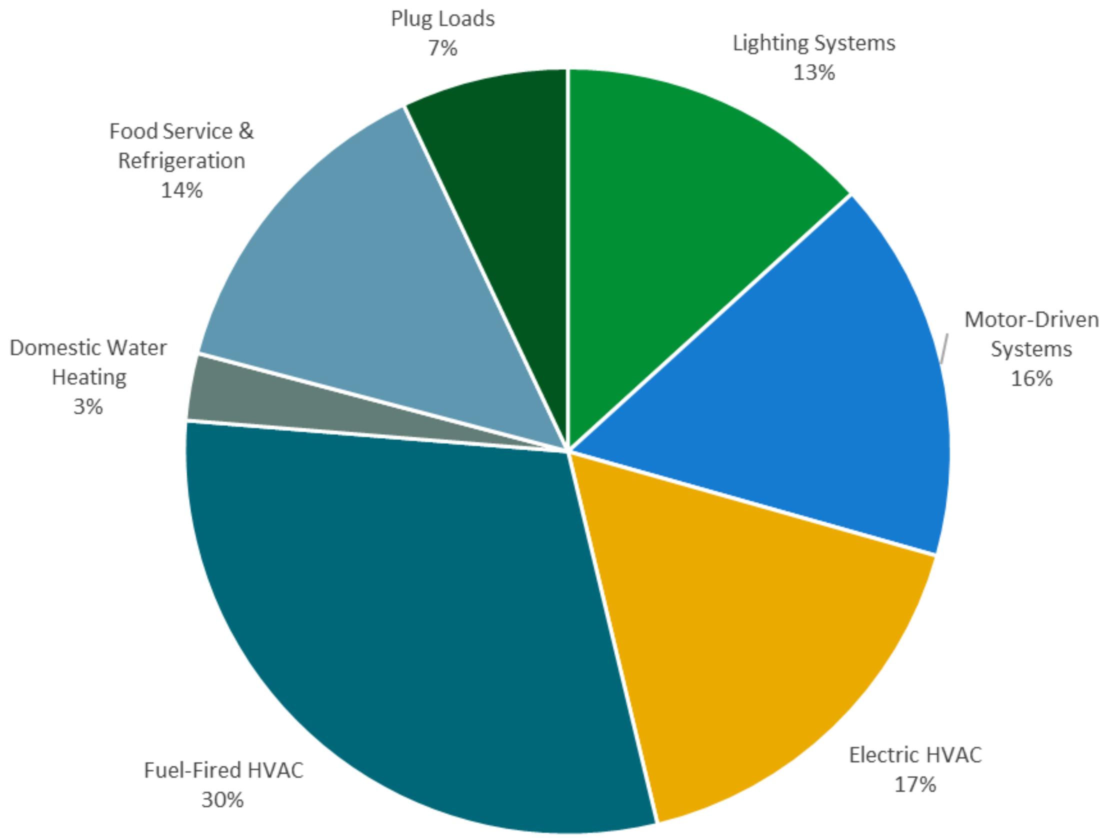
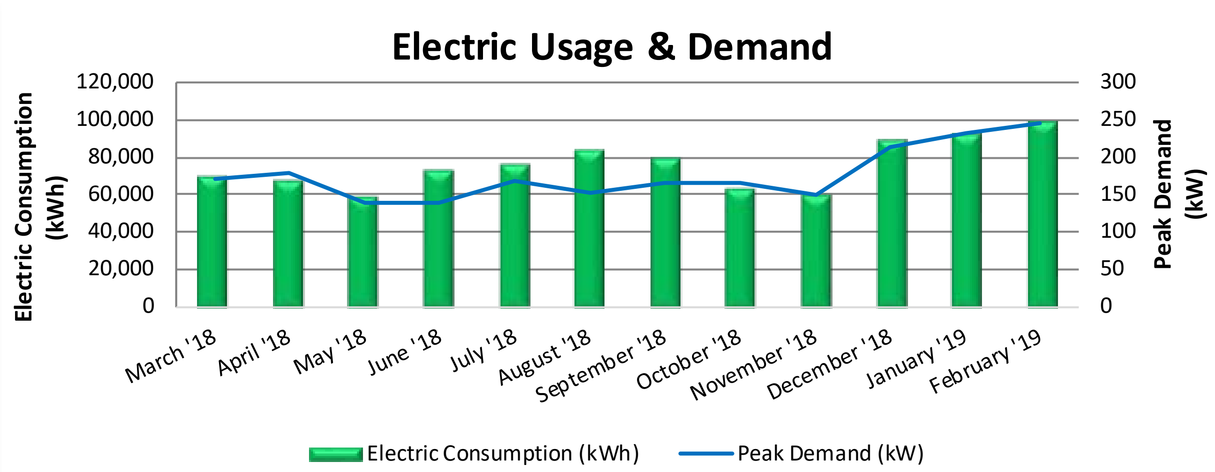


Figure 5 - Energy Balance

3.1 Electricity

JCP&L delivers electricity under rate class GSS, with electric production provided by South Jersey Energy/TriEagle Energy, a third-party supplier.



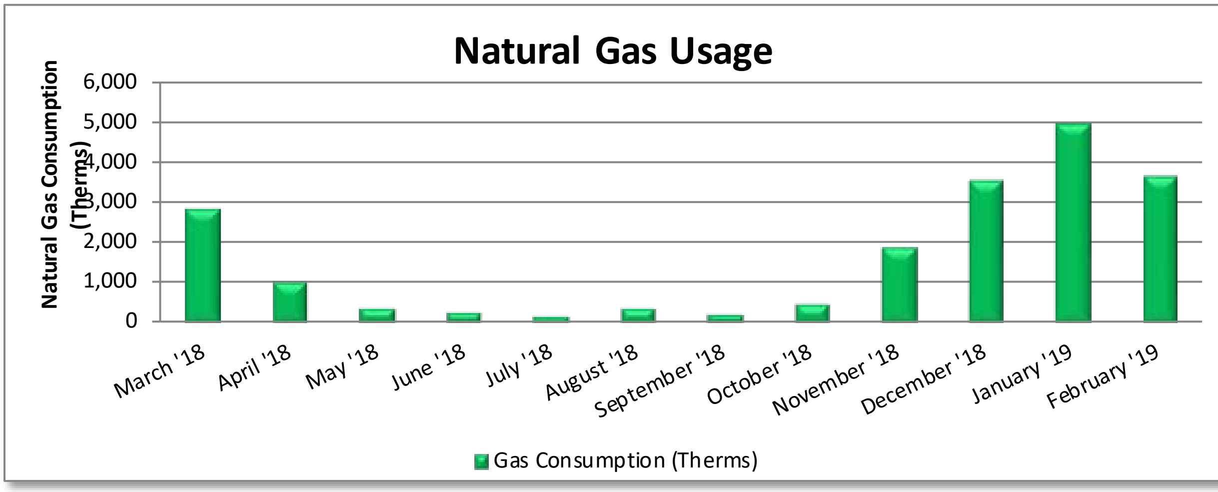
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
3/27/18	30	69,504	170	$1,053	$8,365
4/25/18	29	67,251	180	$1,071	$7,598
5/25/18	30	58,531	140	$815	$6,923
6/26/18	32	73,042	140	$872	$8,411
7/26/18	30	75,602	168	$1,063	$8,854
8/27/18	32	83,145	153	$959	$9,415
9/26/18	30	79,064	165	$1,043	$8,822
10/25/18	29	63,308	166	$978	$7,960
11/27/18	33	60,088	149	$870	$7,365
12/27/18	30	88,847	213	$1,275	$11,399
1/25/19	29	92,322	233	$1,397	$10,450
2/25/19	31	98,402	247	$1,484	$11,187
Totals	**365**	**909,106**	**247**	**$12,881**	**$106,748**
Annual	**365**	**909,106**	**247**	**$12,881**	**$106,748**

Notes:

- Peak demand of 247 kW occurred in February '19.
- The average electric cost over the past 12 months was $0.117/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

New Jersey Natural Gas delivers natural gas under rate class GSL, with natural gas supply provided by South Jersey Energy, a third-party supplier.



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
4/6/18	30	2,809	$2,461
5/3/18	27	1,007	$1,044
6/6/18	34	380	$498
7/9/18	33	289	$486
8/3/18	25	173	$342
8/29/18	26	382	$557
10/1/18	33	208	$400
11/2/18	32	471	$602
12/5/18	33	1,892	$1,692
1/5/19	31	3,531	$3,940
2/5/19	31	4,927	$4,859
3/7/19	30	3,602	$3,410
Totals	**365**	**19,672**	**$20,291**
Annual	**365**	**19,672**	**$20,291**

Notes:

- The average gas cost for the past 12 months is $1.032/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

Benchmarking Score	32

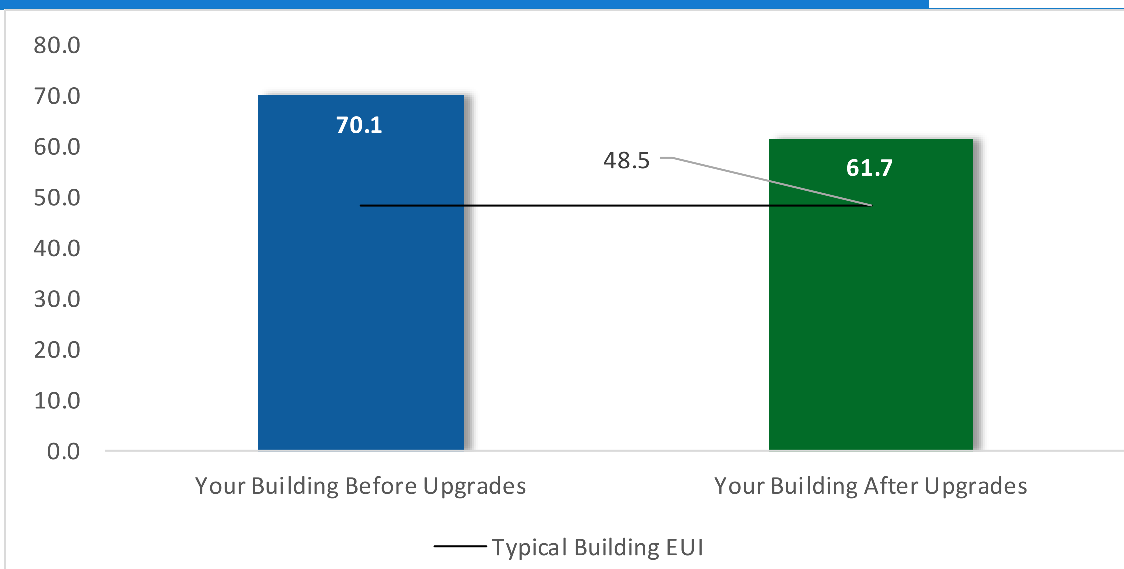


Figure 6 - Energy Use Intensity Comparison

This building performs at, or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause a~~s~~ building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**111,678**	**26.3**	**-14**	**$12,970**	**$83,436**	**$13,772**	**$69,664**	**5.4**	**110,827**
ECM 1	Install LED Fixtures	43,500	5.0	0	$5,108	$48,298	$5,000	$43,298	8.5	43,805
ECM 2	Retrofit Fixtures with LED Lamps	68,178	21.4	-14	$7,862	$35,138	$8,772	$26,366	3.4	67,023
Lighting Control Measures		**6,290**	**1.6**	**-1**	**$725**	**$4,360**	**$570**	**$3,790**	**5.2**	**6,180**
ECM 3	Install Occupancy Sensor Lighting Controls	6,290	1.6	-1	$725	$4,360	$570	$3,790	5.2	6,180
Variable Frequency Drive (VFD) Measures		**49,462**	**14.0**	**0**	**$5,808**	**$41,559**	**$3,760**	**$37,799**	**6.5**	**49,808**
ECM 4	Install VFDs on Constant Volume (CV) Fans	49,462	14.0	0	$5,808	$41,559	$3,760	$37,799	6.5	49,808
Domestic Water Heating Upgrade		**0**	**0.0**	**62**	**$642**	**$11,608**	**$398**	**$11,210**	**17.5**	**7,291**
ECM 5	Install High Efficiency Gas-Fired Water Heater	0	0.0	20	$202	$11,500	$398	$11,102	55.0	2,291
ECM 6	Install Low-Flow DHW Devices	0	0.0	43	$440	$108	$0	$108	0.2	5,000
Food Service & Refrigeration Measures		**3,224**	**0.4**	**0**	**$379**	**$460**	**$100**	**$360**	**1.0**	**3,246**
ECM 7	Vending Machine Control	3,224	0.4	0	$379	$460	$100	$360	1.0	3,246
TOTALS		**170,654**	**42.3**	**47**	**$20,523**	**$141,423**	**$18,600**	**$122,823**	**6.0**	**177,352**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**111,678**	**26.3**	**-14**	**$12,970**	**$83,436**	**$13,772**	**$69,664**	**5.4**	**110,827**
ECM 1	Install LED Fixtures	43,500	5.0	0	$5,108	$48,298	$5,000	$43,298	8.5	43,805
ECM 2	Retrofit Fixtures with LED Lamps	68,178	21.4	-14	$7,862	$35,138	$8,772	$26,366	3.4	67,023
Lighting Control Measures		**6,290**	**1.6**	**-1**	**$725**	**$4,360**	**$570**	**$3,790**	**5.2**	**6,180**
ECM 3	Install Occupancy Sensor Lighting Controls	6,290	1.6	-1	$725	$4,360	$570	$3,790	5.2	6,180
Variable Frequency Drive (VFD) Measures		**49,462**	**14.0**	**0**	**$5,808**	**$41,559**	**$3,760**	**$37,799**	**6.5**	**49,808**
ECM 4	Install VFDs on Constant Volume (CV) Fans	49,462	14.0	0	$5,808	$41,559	$3,760	$37,799	6.5	49,808
Domestic Water Heating Upgrade		**0**	**0.0**	**43**	**$440**	**$108**	**$0**	**$108**	**0.2**	**5,000**
ECM 6	Install Low-Flow DHW Devices	0	0.0	43	$440	$108	$0	$108	0.2	5,000
Food Service & Refrigeration Measures		**3,224**	**0.4**	**0**	**$379**	**$460**	**$100**	**$360**	**1.0**	**3,246**
ECM 7	Vending Machine Control	3,224	0.4	0	$379	$460	$100	$360	1.0	3,246
TOTALS		**170,654**	**42.3**	**27**	**$20,322**	**$129,922**	**$18,202**	**$111,720**	**5.5**	**175,061**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**111,678**	**26.3**	**-14**	**$12,970**	**$83,436**	**$13,772**	**$69,664**	**5.4**	**110,827**
ECM 1	Install LED Fixtures	43,500	5.0	0	$5,108	$48,298	$5,000	$43,298	8.5	43,805
ECM 2	Retrofit Fixtures with LED Lamps	68,178	21.4	-14	$7,862	$35,138	$8,772	$26,366	3.4	67,023

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources are proposed, we suggest converting all of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the Elementary School, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

Replace existing fixtures containing HID lamps with new LED light fixtures. This measure saves energy by installing LEDs, which use less power than other technologies with a comparable light output.

In some cases, HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixture(s).

Maintenance savings may also be achieved, as LED lamps last longer than other light sources and therefore do not need to be replaced as often.

Affected building areas: exterior fixtures

ECM 2: Retrofit Fixtures with LED Lamps

Replace fluorescent, compact fluorescent lamps, or incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as direct replacements for most other lighting technologies.

This measure saves energy by installing LEDs, which use less power than other lighting technologies while providing equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes, CFL, and incandescent lamps.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**111,678**	**26.3**	**-14**	**$12,970**	**$83,436**	**$13,772**	**$69,664**	**5.4**	**110,827**
ECM 1	Install LED Fixtures	43,500	5.0	0	$5,108	$48,298	$5,000	$43,298	8.5	43,805
ECM 2	Retrofit Fixtures with LED Lamps	68,178	21.4	-14	$7,862	$35,138	$8,772	$26,366	3.4	67,023

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 3: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote-mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected building areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms.

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**49,462**	**14.0**	**0**	**$5,808**	**$41,559**	**$3,760**	**$37,799**	**6.5**	**49,808**
ECM 4	Install VFDs on Constant Volume (CV) Fans	49,462	14.0	0	$5,808	$41,559	$3,760	$37,799	6.5	49,808

Variable frequency drives (VFDs) control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor to conservatively account for the cost of an inverter duty rated motor.

Premium efficiency motors have been proposed to be installed only in conjunction with proposed VFD motor measures. Non-inverter duty rated motors will need to be replaced when the VFD measure is implemented.

ECM 4: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone while maintaining a constant supply air temperature.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: ERV 1-5.

4.4 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**62**	**$642**	**$11,608**	**$398**	**$11,210**	**17.5**	**7,291**
ECM 5	Install High Efficiency Gas-Fired Water Heater	0	0.0	20	$202	$11,500	$398	$11,102	55.0	2,291
ECM 6	Install Low-Flow DHW Devices	0	0.0	43	$440	$108	$0	$108	0.2	5,000

ECM 5: Install High-Efficiency Gas-Fired Water Heater

We evaluated replacing the existing tank water heater with a high-efficiency tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water, and fewer operating hours to maintain the tank water temperature.

ECM 6: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low-flow devices are recommended to reduce hot water usage:

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

Low-flow devices reduce the overall water flow from the fixture while still providing adequate pressure for washing. Pre-rinse spray valves (PRSVs)—often used in commercial and institutional kitchens—remove food waste from dishes prior to dishwashing.

Additional cost savings may result from reduced water usage.

4.5 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**3,224**	**0.4**	**0**	**$379**	**$460**	**$100**	**$360**	**1.0**	**3,246**
ECM 7	Vending Machine Control	3,224	0.4	0	$379	$460	$100	$360	1.0	3,246

ECM 7: Vending Machine Control

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time and power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[4]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

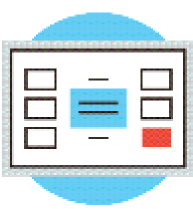
Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly.

Motor Maintenance

Motors have many moving parts. As these parts degrade over time, the efficiency of the motor is reduced. Routine maintenance prevents damage to motor components. Routine maintenance should include cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Thermostat Schedules and Temperature Resets



Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan, and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

Boiler Maintenance

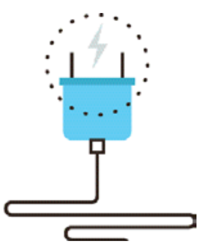
Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

Water Heater Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

[5] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense™ website[6] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the Elementary School is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense™ products where available.

[6] https://www.epa.gov/watersense

[7] https://www.epa.gov/watersense/watersense-work-0

6 On-site Generation

You don’t have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the Elementary School’s electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for the Elementary School. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

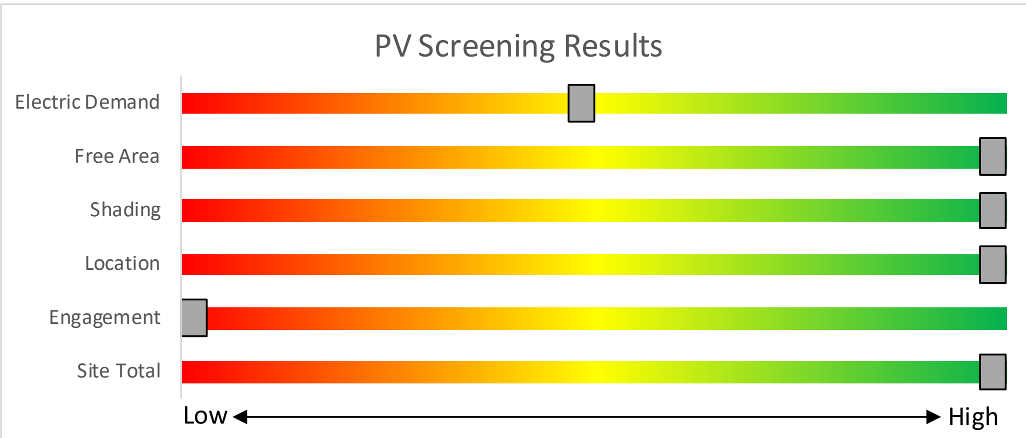
6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the Elementary School's electric demand, size and location of free area, and shading elements shows that the facility has **high** potential for installing additional PV arrays.

The amount of free area, ease of installation (roof) and the lack of shading elements contribute to the high potential. Expanding the PV array on the roof or parking lot may be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	High	
System Potential	177	kW DC STC
Electric Generation	210,872	kWh/yr
Displaced Cost	$24,760	/yr
Installed Cost	$460,200	

Figure 9 - Photovoltaic Screening

Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

- **Basic Info on Solar PV in New Jersey**: www.njcleanenergy.com/whysolar
- **New Jersey Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the New Jersey Market**: www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

6.2 Combined Heat and Power

Combined heat and power (CHP) generate electricity at the Elementary School and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

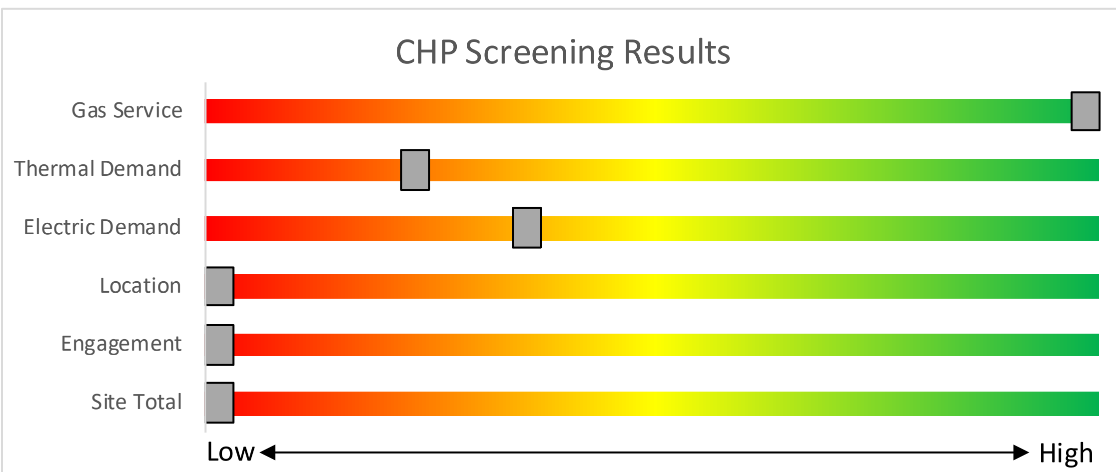
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has **no** potential for installing a cost-effective CHP system.

Low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	None	
System Type	None	
System Potential	50	kW
Electric Generation	115,884	kWh/yr
Thermal Generation	738,224	MBtu/yr
Displaced Cost	$7,812	/yr
Installed Cost	$224,000	

Figure 10 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: [http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.](http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/)

7 Project Funding and Incentives

Ready to improve your building's performance? Pick the program that works best for you. Incentive programs that may apply to the Elementary School are identified in the Executive Summary. This section provides an overview of currently available New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.
Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.			

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at your facility. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficient equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

Incentives

Incentives are based on estimated and achieved energy savings ranging from \$0.18-\$0.22/kWh and \$1.80-\$2.50/therm, capped at the lesser of 50% total project cost, or \$1 million per electric account and \$1 million per natural gas account, per fiscal year, not to exceed \$2 million per project. An incentive of \$0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

Contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan, assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine	>3 MW	$350		
Fuel Cells with Heat Recovery				
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at: www.njcleanenergy.com/CHP.

7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the energy savings plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.6 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: [www.njcleanenergy.com/srec.](http://www.njcleanenergy.com/srec)

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for the Elementary School's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[8].

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier typically depends on whether a customer prefers budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

[8] www.state.nj.us/bpu/commercial/shopping.html

[9] www.state.nj.us/bpu/commercial/shopping.html

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.3	1,047	0	$121	$402	$110	2.4
Boiler room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Faculty planning	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	969	0	$112	$562	$115	4.0
Women's restroom	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	525	0	$61	$292	$80	3.5
Men's restrom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	66	0	$8	$37	$10	3.5
CR 207	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 206	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 205	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 204	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 203	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 202	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 201	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 200	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
208 SGI	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	525	0	$61	$292	$80	3.5
Girls 2nd floor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
Custodian closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	131	0	$15	$73	$20	3.5
Boys 2nd floor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
2nd floor hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.4	1,182	0	$136	$657	$180	3.5
2nd floor hallway	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairwell A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.1	381	0	$44	$146	$40	2.4
Stairwell A	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Elevator machine room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.1	285	0	$33	$110	$30	2.4
Elevator	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	2,622	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	None	29	2,622	0.0	190	0	$22	$73	$20	2.4
CR 107	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 106	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR 105	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 104	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 103	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
Stairwell B	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.1	381	0	$44	$146	$40	2.4
Stairwell B	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 102	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 101	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR 100	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
Girls 1st floor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
Boys 1st floor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
108 SGI	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	525	0	$61	$292	$80	3.5
Custodian closet 1st floor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	131	0	$15	$73	$20	3.5
1st floor hall	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.4	1,182	0	$136	$657	$180	3.5
1st floor hall	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Teachers mail room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	197	0	$23	$110	$30	3.5
Teachers mail room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gym	22	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Occupancy Sensor	S	120	1,809	2	Relamp	No	22	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,809	1.0	2,714	-1	$313	$1,607	$440	3.7
Gym	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gym office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	295	0	$34	$164	$45	3.5
Gym office	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,809	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,809	0.0	32	0	$4	$33	$6	7.2
Gym toilet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	131	0	$15	$73	$20	3.5
Gym storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	328	0	$38	$183	$50	3.5
Stage	13	Compact Fluorescent: Decorative fixture 4 pin - 6 lamps	Wall Switch	S	192	2,622	2	Relamp	No	13	LED Lamps: Decorative fixture 4 pin - 6 lamps	Wall Switch	134	2,622	0.5	2,159	0	$249	$1,344	$78	5.1
Lift area	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	95	0	$11	$37	$10	2.4
Lift area	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
134 A Music	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.5	2,058	0	$237	$891	$205	2.9
134 A Music	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
123 Art	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.5	2,180	0	$251	$927	$215	2.8
123 Art	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR 122	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
Custdian closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	66	0	$8	$37	$10	3.5
Women's 1st floor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
Supply room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	95	0	$11	$37	$10	2.4
Hall by gym	23	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,809	2	Relamp	No	23	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,809	0.3	732	0	$84	$748	$138	7.2
Hall by gym	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Media Center	6	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,622	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,809	0.1	368	0	$42	$195	$36	3.8
Media Center	57	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	57	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	1.7	6,902	-1	$796	$2,891	$675	2.8
Media Center	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Media Center	6	Compact Fluorescent: Cane lights - 1 lamp	Wall Switch	S	26	2,622	2, 3	Relamp	Yes	6	LED Lamps: Cane lights - 1 lamp	Occupancy Sensor	18	1,809	0.1	233	0	$27	$103	$6	3.6
Media center storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	131	0	$15	$73	$20	3.5
Librarian	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	394	0	$45	$219	$60	3.5
MC storage 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	394	0	$45	$219	$60	3.5
Music storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	263	0	$30	$146	$40	3.5
Cafeteria	9	Compact Fluorescent: Decorative dome 4 pin - 6 lamps	Wall Switch	S	192	2,622	2, 3	Relamp	Yes	9	LED Lamps: Decorative dome 4 pin - 6 lamps	Occupancy Sensor	134	1,809	0.6	2,576	-1	$297	$1,200	$89	3.7
Cafeteria	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Cafeteria	11	LED - Fixtures: Decorative dome 4 pin - 6 lamps	Wall Switch	S	60	2,622	3	None	Yes	11	LED - Fixtures: Decorative dome 4 pin - 6 lamps	Occupancy Sensor	60	1,809	0.1	590	0	$68	$270	$35	3.5
Platform storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	131	0	$15	$73	$20	3.5
Receiving	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	1,211	0	$140	$635	$135	3.6
Receiving	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
17 Vestibule	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,622	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,622	0.0	143	0	$16	$55	$15	2.4

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
17 Vestibule	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Electrical Utilities	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
Telephone room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	727	0	$84	$489	$95	4.7
Telephone room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.5	1,477	0	$170	$822	$225	3.5
Kitchen	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Non-food storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	197	0	$23	$110	$30	3.5
Women's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	66	0	$8	$37	$10	3.5
Dry food storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
Kitchen office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	197	0	$23	$110	$30	3.5
Janitor's closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	66	0	$8	$37	$10	3.5
Kitchen hood	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.1	381	0	$44	$146	$40	2.4
Serving area	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,622	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.4	1,453	0	$167	$708	$155	3.3
Faculty dining	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.2	591	0	$68	$329	$90	3.5
Faculty dining	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main lobby	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,622	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,622	0.0	185	0	$21	$130	$24	5.0
Main lobby	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main lobby	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,622	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,622	0.0	185	0	$21	$130	$24	5.0
Main entrance	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,622	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,622	0.0	185	0	$21	$130	$24	5.0
Main entrance	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main office	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	1,332	0	$154	$672	$145	3.4
Main office	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main office kitchen	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.1	285	0	$33	$110	$30	2.4
Main office closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,622	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	363	0	$42	$226	$30	4.7
Conference room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,622	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	363	0	$42	$226	$50	4.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Guidance office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	197	0	$23	$110	$30	3.5
Guidance office	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,809	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,809	0.0	64	0	$7	$65	$12	7.2
Principal's office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,809	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	394	0	$45	$219	$60	3.5
Child study	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	263	0	$30	$146	$40	3.5
Toilet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	95	0	$11	$37	$10	2.4
Nurse's office	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	848	0	$98	$526	$105	4.3
Nurse's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	66	0	$8	$37	$10	3.5
Nurse's exam room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	363	0	$42	$226	$50	4.2
Speech therapy	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,622	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,809	0.1	545	0	$63	$280	$65	3.4
Electrical closet	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.1	381	0	$44	$146	$40	2.4
Data closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	242	0	$28	$189	$40	5.3
Hall by main office	16	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,622	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,809	0.2	981	0	$113	$790	$131	5.8
Hall by main office	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR J	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR A	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR B	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
Vestibule 3	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.1	285	0	$33	$110	$30	2.4
Vestibule 3	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR C	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR C restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	95	0	$11	$37	$10	2.4
CR D	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR D restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	95	0	$11	$37	$10	2.4
CR E	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR E restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	95	0	$11	$37	$10	2.4
CR F	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR F restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	95	0	$11	$37	$10	2.4
CR G	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
CR G restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	95	0	$11	$37	$10	2.4
Teachers room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	591	0	$68	$329	$90	3.5
Teachers room toilet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.0	66	0	$8	$37	$10	3.5
Vestibule 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.1	285	0	$33	$110	$30	2.4
Vestibule 2	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR I	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.3	788	0	$91	$438	$120	3.5
Pre K Boys restroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
Pre K Girls restroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.1	394	0	$45	$219	$60	3.5
Custodian closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,622	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,622	0.0	190	0	$22	$73	$20	2.4
N SGI	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	525	0	$61	$292	$80	3.5
O SGI	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.2	525	0	$61	$292	$80	3.5
Alphabet Hall	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,809	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,809	0.5	1,248	0	$144	$694	$190	3.5
Alphabet Hall	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Area light	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		57	4,380		None	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	57	4,380	0.0	0	0	$0	$0	$0	0.0
Wall pack	24	Metal Halide: (1) 70W Lamp	Photocell		95	4,380	1	Fixture Replacement	No	24	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	29	4,380	0.8	6,990	0	$821	$23,183	$2,400	25.3
Wall sconces	31	Compact Fluorescent: 4 pin - 1 lamp	Timeclock		26	4,380	2	Relamp	No	31	LED Lamps: 4 pin - 1 lamp	Timeclock	18	4,380	0.1	1,059	0	$124	$534	$31	4.0
Parking lot	24	Metal Halide: (1) 400W Lamp	Photocell		458	4,380	1	Fixture Replacement	No	24	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	137	4,380	3.8	33,701	0	$3,957	$23,183	$2,400	5.3
Roadway	2	Metal Halide: (1) 400W Lamp	Photocell		458	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	137	4,380	0.3	2,808	0	$330	$1,932	$200	5.3
Wall sconces	11	Compact Fluorescent: 4 pin - 1 lamp	Timeclock		32	4,380	2	Relamp	No	11	LED Lamps: 4 pin - 1 lamp	Timeclock	22	4,380	0.1	463	0	$54	$189	$11	3.3
Table lamp	2	Incandescent: Screw-in1 lamp	Wall Switch	S	60	2,622	2	Relamp	No	2	LED Lamps: Screw-in 1 lamp	Wall Switch	9	2,622	0.1	294	0	$34	$34	$2	1.0

Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions: Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	Proposed Conditions: ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Energy Impact & Financial Analysis: Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	DHW	1	Combustion Air Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler room	DHW Circulation	1	Water Supply Pump	0.8	60.0%	No	W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Cooling tower fan	1	Cooling Tower Fan	10.0	91.7%	Yes	W	3,391		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERV 3	1	Exhaust Fan	7.5	87.0%	No	W	3,250	4	No	91.0%	Yes	1	2.4	8,458	0	$993	$4,738	$600	4.2
Roof	ERV 3	1	Supply Fan	5.0	91.0%	No	W	3,250	4	No	91.0%	Yes	1	1.4	4,996	0	$587	$4,076	$400	6.3
Roof	ERV 4	1	Exhaust Fan	3.0	88.0%	No	W	3,250	4	No	89.5%	Yes	1	0.9	3,193	0	$375	$3,812	$240	9.5
Roof	ERV 4	1	Supply Fan	3.0	88.0%	No	W	3,250	4	No	89.5%	Yes	1	0.9	3,193	0	$375	$3,812	$240	9.5
Roof	ERV 2	1	Exhaust Fan	5.0	88.0%	No	W	3,250	4	No	89.5%	Yes	1	1.5	5,322	0	$625	$4,197	$400	6.1
Roof	ERV 2	1	Supply Fan	7.5	91.0%	No	W	3,250	4	No	91.7%	Yes	1	2.2	7,596	0	$892	$4,761	$600	4.7
Roof	ERV 1	1	Exhaust Fan	5.0	89.0%	No	W	3,250	4	No	89.5%	Yes	1	1.5	5,159	0	$606	$4,197	$400	6.3
Roof	ERV 1	1	Supply Fan	5.0	89.0%	No	W	3,250	4	No	89.5%	Yes	1	1.4	5,159	0	$606	$4,197	$400	6.3
Boiler room	ERV 5	1	Exhaust Fan	3.0	88.0%	No	W	3,250	4	No	89.5%	Yes	1	0.9	3,193	0	$375	$3,884	$240	9.7
Boiler room	ERV 5	1	Supply Fan	3.0	88.0%	No	W	3,250	4	No	89.5%	Yes	1	0.9	3,193	0	$375	$3,884	$240	9.7
Boiler room	P 1,2	2	Heating Hot Water Pump	15.0	93.0%	Yes	W	980		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler room	P 3,4	2	Water-Source Heat Pump Circulation Pump	10.0	91.7%	Yes	W	3,391		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Elevator machine room	Hydraulic pump	1	Process Pump	25.0	93.0%	No	W	500		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Various spaces	10	Exhaust Fan	0.3	60.0%	No	W	3,000		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Various	WSHP	57	Supply Fan	0.3	70.0%	No	W	3,250		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Various spaces	Various spaces	8	Electric Resistance Heat		25.59	W		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	57	Water Source HP	2.50	8.53	W		No							0.0	0	0	$0	$0	$0	0.0

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room 1	All building	1	Condensing Hot Water Boiler	######	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler room 2	All building	1	Condensing Hot Water Boiler	######	W		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Restrooms and sinks	1	Storage Tank Water Heater (> 50 Gal)	B	5	Yes	1	Storage Tank Water Heater (> 50 Gal)	Natural Gas	93.00%	Et	0.0	0	20	$202	$11,500	$398	55.0

Low-Flow Device Recommendations

	Recommendation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	6	15	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	43	$440	$108	$0	0.2

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)		No	No	No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Medium Temp Freezer (0F to 30F)		No	No	No	0.0	0	0	$0	$0	$0	0.0

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Refrigerator Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Ice Making Head (<450 lbs/day), Batch	Yes		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	4	Gas Convection Oven (Full Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Griddle (≤2 Feet Width)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Steamer	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	6	Insulated Food Holding Cabinet (Full Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

Location	Existing Conditions			
	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Joseph T Donahue ES	133	Desktop Computer	145.0	Yes
Joseph T Donahue ES	5	Chrome book carts	70.0	Yes
Joseph T Donahue ES	6	Servers	1,200.0	Yes
Joseph T Donahue ES	45	Printer - Small	60.0	Yes
Joseph T Donahue ES	9	Printer - Medium	80.0	Yes
Joseph T Donahue ES	5	Printer - Big	200.0	Yes
Joseph T Donahue ES	44	Projector	250.0	Yes
Joseph T Donahue ES	6	Microwave	900.0	Yes
Joseph T Donahue ES	2	Refrigerator - Small	60.0	Yes
Joseph T Donahue ES	9	Refrigerator - Large	220.0	Yes
Joseph T Donahue ES	5	Coffee Machine	400.0	Yes
Joseph T Donahue ES	2	Toaster Oven	1,200.0	Yes
Joseph T Donahue ES	4	Television - CRT/DLP	120.0	Yes
Joseph T Donahue ES	3	LCD	110.0	Yes
Joseph T Donahue ES	5	LED	90.0	Yes
Joseph T Donahue ES	1	Hot/Cold Water Dispenser	520.0	Yes
Joseph T Donahue ES	26	Smart board	5.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Teachers lounge	2	Refrigerated	7	Yes	0.4	3,224	0	$379	$460	$100	1.0

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

32

ENERGY STAR® Score[1]

Joseph T Donahue Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 72,300
Built: 2008

For Year Ending: January 31, 2019
Date Generated: July 13, 2019

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Joseph T Donahue Elementary School 200 Bengal Blvd Barnegat, New Jersey 08005	Barnegat Township School District 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 (____)____-______	Stephen Brennan 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 609-698-5800 SBRENNAN@BARNEGATSCHOOLS.COI

Property ID: 7072045

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
66 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	1,738,832 (36%)
Electric - Grid (kBtu)	3,032,646 (64%)

Source EUI
142.7 kBtu/ft²

National Median Comparison

National Median Site EUI (kBtu/ft²)	56
National Median Source EUI (kBtu/ft²)	121.1
% Diff from National Median Source EUI	18%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	400

Signature & Stamp of Verifying Professional

I _________________ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: ______________________Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer Stamp
(if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gas* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.
gpf	*Gallons per flush*

gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp.
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units.
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp.
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp.
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge.
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense™	The symbol for water efficiency. The WaterSense™ program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.

Local Government Energy Audit Report

Lillian M. Dunfee Elementary School

October 31, 2019

Prepared for:
Barnegat Township School District
128 Barnegat Blvd. South
Barnegat, New Jersey 08005

Prepared by:
TRC
900 Route 9 North
Woodbridge, New Jersey 07095

Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC Companies, Inc. reviewed the energy conservation measures and estimates of energy savings were reviewed for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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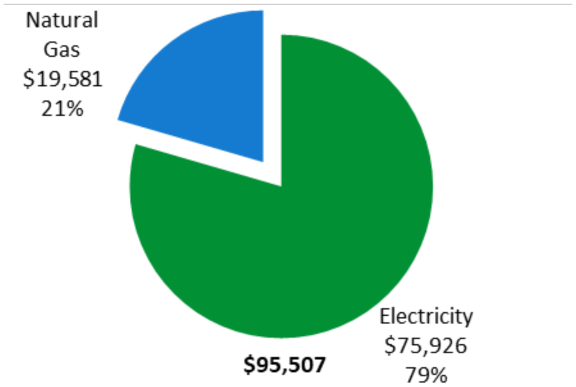
Table of Contents

1 Executive Summary

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Lillian M. Dunfee Elementary School. This report provides you with information about the Elementary School's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in the Elementary School. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $95,507 Electricity: 599,336 kWh Natural Gas: 18,560 Therms	
ENERGY STAR® Benchmarking Score	57 *(1-100 scale)*	Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance and lower your energy bills even more.

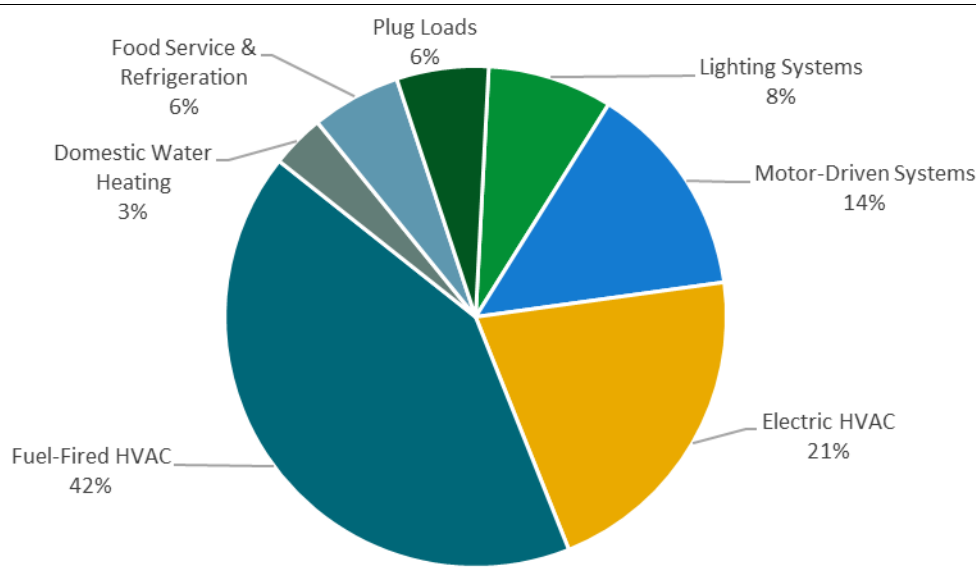


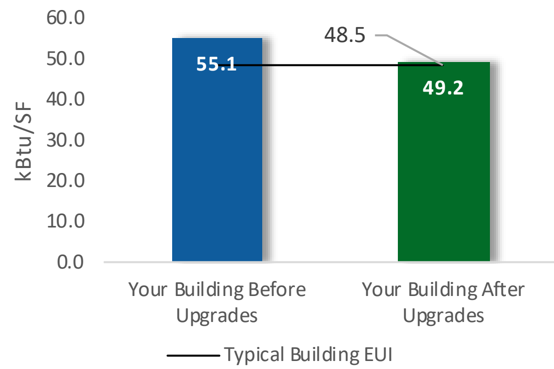
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

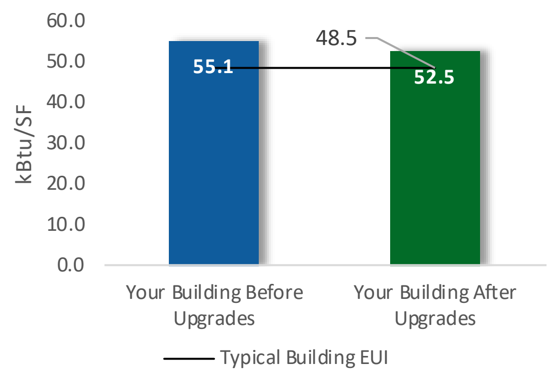
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$446,578
Potential Rebates & Incentives[1]	$13,664
Annual Cost Savings	$10,623
Annual Energy Savings	Electricity: 68,435 kWh Natural Gas: 1,852 Therms
Greenhouse Gas Emission Savings	45 Tons
Simple Payback	40.8 Years
Site Energy Savings (all utilities)	11%



Scenario 2: Cost Effective Package[2]

Installation Cost	$33,937
Potential Rebates & Incentives	$2,556
Annual Cost Savings	$6,152
Annual Energy Savings	Electricity: 46,381 kWh Natural Gas: 262 Therms
Greenhouse Gas Emission Savings	25 Tons
Simple Payback	5.1 Years
Site Energy Savings (all utilities)	5%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	*Cost effective?*	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**9,100**	**1.5**	**-1**	**$1,142**	**$3,485**	**$486**	**$2,999**	**2.6**	**9,043**
ECM 1	Retrofit Fixtures with LED Lamps	Yes	9,100	1.5	-1	$1,142	$3,485	$486	$2,999	2.6	9,043
Lighting Control Measures			**19,397**	**3.9**	**-4**	**$2,415**	**$16,910**	**$1,420**	**$15,490**	**6.4**	**19,058**
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	16,213	3.3	-3	$2,018	$13,310	$1,420	$11,890	5.9	15,930
ECM 3	Install High/Low Lighting Controls	Yes	3,184	0.6	-1	$396	$3,600	$0	$3,600	9.1	3,129
Variable Frequency Drive (VFD) Measures			**16,272**	**3.1**	**0**	**$2,061**	**$13,154**	**$600**	**$12,554**	**6.1**	**16,386**
ECM 4	Install VFDs on Constant Volume (CV) Fans	Yes	7,759	2.1	0	$983	$4,761	$600	$4,161	4.2	7,813
ECM 5	Install VFDs on Heating Water Pumps	Yes	8,513	1.0	0	$1,079	$8,394	$0	$8,394	7.8	8,573
Electric Unitary HVAC Measures			**22,054**	**15.1**	**0**	**$2,794**	**$350,615**	**$7,608**	**$343,007**	**122.8**	**22,208**
ECM 6	Install High Efficiency Air Conditioning Units	No	22,054	15.1	0	$2,794	$350,615	$7,608	$343,007	122.8	22,208
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**146**	**$1,539**	**$53,358**	**$3,200**	**$50,158**	**32.6**	**17,082**
ECM 7	Install High Efficiency Furnaces	No	0	0.0	146	$1,539	$53,358	$3,200	$50,158	32.6	17,082
Domestic Water Heating Upgrade			**0**	**0.0**	**44**	**$468**	**$8,826**	**$300**	**$8,526**	**18.2**	**5,197**
ECM 8	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	13	$138	$8,669	$300	$8,369	60.7	1,530
ECM 9	Install Low-Flow DHW Devices	Yes	0	0.0	31	$330	$158	$0	$158	0.5	3,667
Food Service & Refrigeration Measures			**1,612**	**0.2**	**0**	**$204**	**$230**	**$50**	**$180**	**0.9**	**1,623**
ECM 10	Vending Machine Control	Yes	1,612	0.2	0	$204	$230	$50	$180	0.9	1,623
TOTALS (COST EFFECTIVE MEASURES)			**46,381**	**8.7**	**26**	**$6,152**	**$33,937**	**$2,556**	**$31,381**	**5.1**	**49,777**
TOTALS (ALL MEASURES)			**68,435**	**23.8**	**185**	**$10,623**	**$446,578**	**$13,664**	**$432,914**	**40.8**	**90,597**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Retrofit Fixtures with LED Lamps	x	x	
ECM 2	Install Occupancy Sensor Lighting Controls	x	x	
ECM 3	Install High/Low Lighting Controls	x	x	
ECM 4	Install VFDs on Constant Volume (CV) HVAC	x	x	
ECM 5	Install VFDs on Hot Water Pumps		x	
ECM 6	Install High Efficiency Electric AC	x	x	
ECM 7	Install High Efficiency Furnaces	x		
ECM 8	Install High Efficiency Gas Water Heater	x	x	
ECM 9	Install Low-Flow Domestic Hot Water Devices		x	
ECM 10	Vending Machine Control		x	

Figure 3 – Funding Options

New Jersey's Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Lillian M. Dunfee Elementary School. This report provides information on how the Elementary School uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see **Appendix A: Equipment Inventory & Recommendations.**

2.1 Site Overview

On July 10, 2019, TRC performed an energy audit at Lillian M. Dunfee Elementary School located in Barnegat, New Jersey. TRC met with Neil Piro to review the facility operations and help focus our investigation on specific energy-using systems.

Lillian M. Dunfee Elementary School is a one-story, 70,817 square foot building built in 1974. Spaces include: classrooms, a gymnasium, a cafeteria, corridors, offices, a kitchen, and a mechanical space.

In 2013, the Elementary School replaced all its existing fluorescent fixtures with LED linear tubes fixtures through the Direct Install program. The facility is 100% heated and cooled, and has onsite generation.

2.2 Building Occupancy

The Elementary School is occupied from September through June. Typical weekday occupancy is 80 staff and 947 students.

Building Name	Weekday/Weekend	Operating Schedule
Lillian M. Dunfee Elementary School	Weekday	6:00 AM - 6:30 PM
	Weekend	Saturday: 8:00 AM - 12:30 PM (Occasional) Sunday: No Operation

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a brick facade. The dividing walls are constructed from concrete masonry units. The roof is built-up, flat, and covered with stone ballast. It is in good condition.

All windows are double-glazed with aluminum frames and a thermal break. The glass-to-frame seals are in good condition. Exterior doors have aluminum frames and are in good condition with undamaged door seals.

Brick facade

Built up stone ballast roof

2.4 Lighting Systems

The primary interior lighting system uses 15-Watt LED linear tubes and 26-watt 4-pin compact fluorescent lamps. Fixture types include 2- or 3- lamp, 4-foot long troffers, and surface-mounted fixtures.

Most fixtures are in good condition. The gymnasium has T5 high-output high bay fixtures that are manually controlled. Most of the interior fixtures in the school are controlled by wall switches. The newer section classrooms and offices are controlled using occupancy sensors. All exit signs are LED units. Interior lighting levels were generally sufficient.

Exterior lighting is provided by wall-mounted and recessed fixtures with 26-watt 4-pin compact fluorescent lamps that are timeclock controlled.

Wall-mounted CFL

LED Exit Light

LED Linear Tubes

Dome Fixture in the Entrance

2.5 Air Handling Systems

Unit Ventilators

There are approximately eight pneumatically controlled unit ventilators with supply fan motors and outside air dampers. Hot water is circulated here from the boiler, and they distribute heat to the respective zones. This system is original to the building and appears to be in fair operating condition.

Packaged Units

The building has seven packaged units manufactured by AAON and Seasons 4. These units serve the gym, hallways, library, and computer lab. They have cooling capacities ranging from 13 to 30-ton and gas-fired furnaces with heating capacities ranging from 146 to 500 MBh. The average EER of these units is 9. Most of the units were installed between the years 2003 to 2008. These are past their useful life and have been evaluated for replacement.

The cafeteria is cooled using four York packaged units, each with a 7-ton cooling capacity. These units have an EER of 11.2 and were installed in 2019. These units are in good condition.

The space temperatures are controlled using an EMS. The cooling setpoints in the facility is between 68°F to 71°F.

Air Conditioners

The electrical room, server room and smaller office spaces are cooled using Mitsubishi and Intercity Products split AC units with cooling capacities between 1 to 3-tons and an average EER of 10.8. Most of these units are past their useful life and have been evaluated for replacement.

The space temperatures are controlled using programmable thermostats in the respective zones.


AAON Packaged Units


Cafeteria Packaged Units


Split AC Unit


Programmable Thermostat for Split Units

2.6 Heating Hot Water Systems

Two LAARS condensing gas-fired hot water boilers serve a portion of the building heating load. The burners are fully-modulating with a nominal efficiency of 85%. The boilers are configured in a lead-lag control scheme. Installed in 2008, they are in good condition.

The boilers are configured in a constant flow primary distribution with two 5 hp constant speed hot water pumps. The boilers provide hot water to unit ventilators in classrooms throughout the building.

The classrooms also have 1 kW electric resistance heaters as backup in case convectors face any issue to provide heat. Heating set points in the buildings are between 71ºF to 74ºF. Gas-fired furnaces provide heat in areas conditioned by package units.

Condensing Hot Water Boiler

Heating Hot Water Pumps

Electric Heater

Unit Ventilators

2.7 Building Energy Management Systems (EMS)

A Carrier Automated Building EMS controls the HVAC equipment, boilers, air handlers, and package units. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures and heating water loop temperatures.

2.8 Domestic Hot Water

Hot water is produced using two water heaters. Both units are gas-fired with input capacities of 150 MBh. The AO Smith heater is 75% efficient with a tank capacity of 100 gallons (AO Smith) while the Laars unit, with a tank capacity of 60 gallons, is 80% efficient. The water heaters were installed in the years 2008 and 2016, respectively. The older unit (AO Smith) has been evaluated for replacement.

The hot water is distributed to end uses using fractional horse power circulation pump.

AO Smith Water Heater

Laars Water Heater

2.9 Food Service Refrigeration Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare lunches for students. Most cooking/reheating is done using a convection gas-fired oven. Bulk prepared foods are held in several electric holding cabinets. Equipment are high-efficiency and in good condition.

The kitchen has a stand-up refrigerator with solid doors and several refrigerated chests. All equipment is standard efficiency and in good condition.

The walk-in refrigerator has an estimated 0.67-ton compressor and a two-fan evaporator. The walk-in medium temperature freezer has an approximately 1.67-ton compressor and a three-fan evaporator with defrost controls.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high-efficiency food service equipment.

Convection Oven

Warmers

Freezer Chest

Reach-in Refrigerator

2.10 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 6% percent of total building energy use. This is higher than a typical building. You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area, as well as Energy Efficient Best Practices.

There are approximately 133 computer work stations throughout the Elementary School. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as Smart Boards, projectors, and fans. There are several residential-style refrigerators throughout the building that are used to store food. These vary in condition and efficiency. There is one refrigerated beverage vending machine and one non-refrigerated vending machine not equipped with occupancy-based controls.

2.11 Water-Using Systems

There are 22 faucets with flow rates at 2.2 gallons per minute (gpm). Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf

2.12 On-Site Generation

Lillian M. Dunfee Elementary School has a photovoltaic (PV) array of approximately 215 kW with 770 panels, installed in 2011. The system provides approximately 65% of the electricity used at the Elementary School.

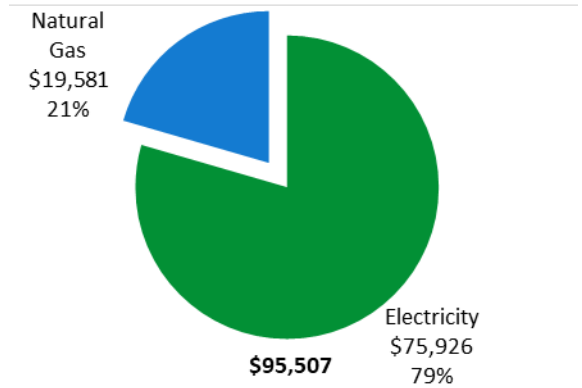
Solar Array

Solar Array (closeup)

3 Energy Use and Costs

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	599,336 kWh	$75,926
Natural Gas	18,560 Therms	$19,581
Total		**$95,507**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

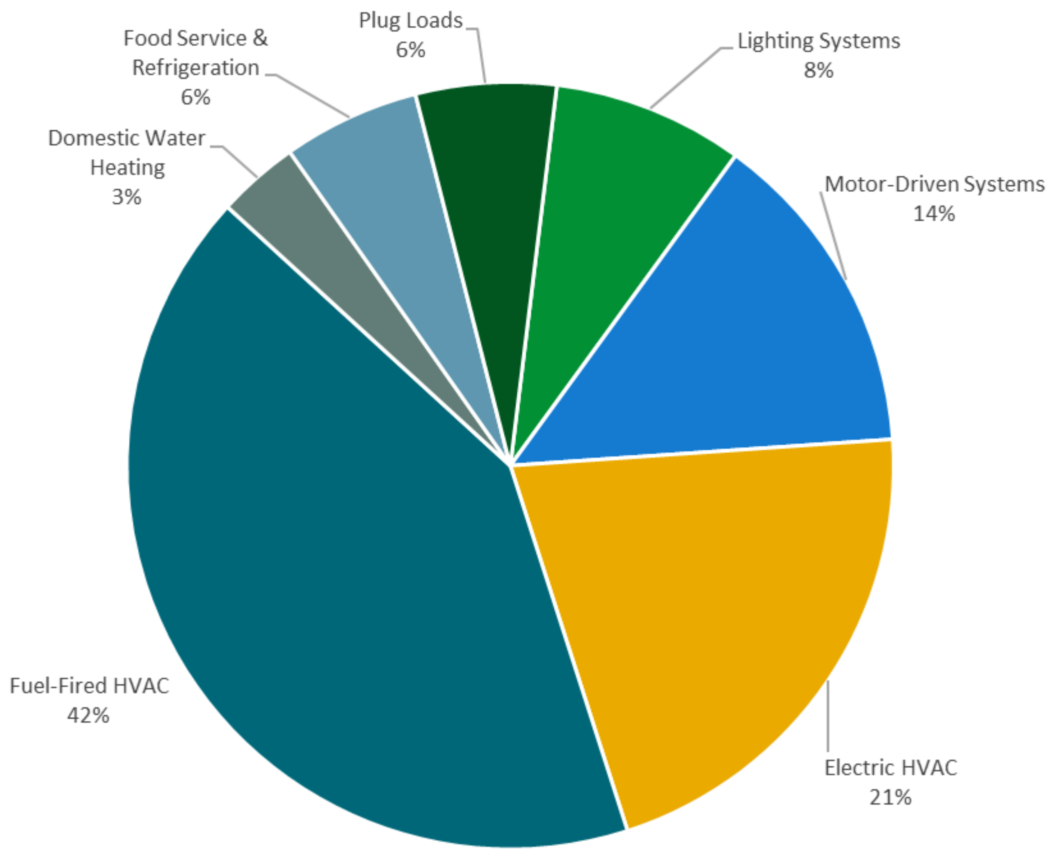
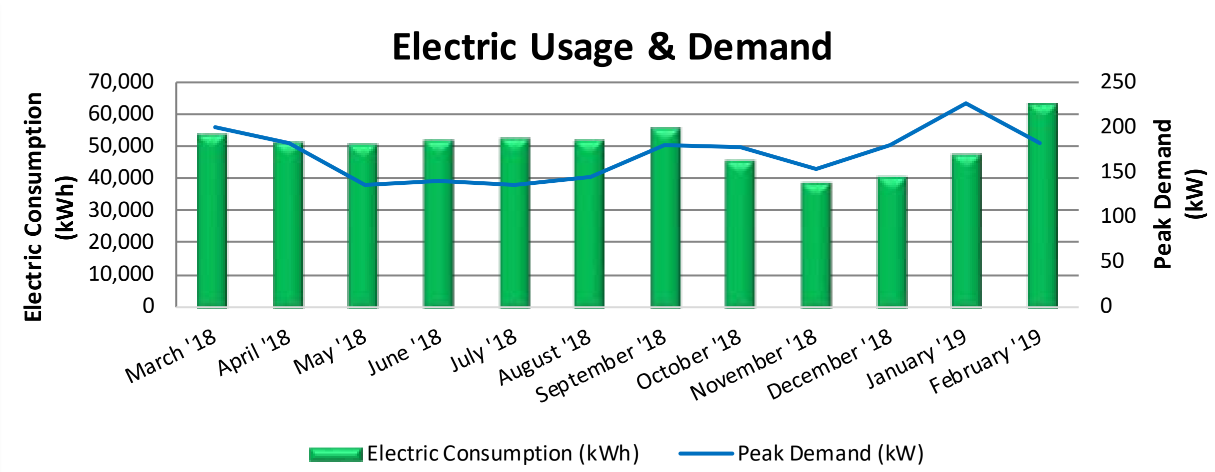


Figure 5 - Energy Balance

3.1 Electricity

JCP&L delivers electricity under rate class GSS, with electric production provided by South Jersey Energy/Trieagle Energy, a third-party supplier.



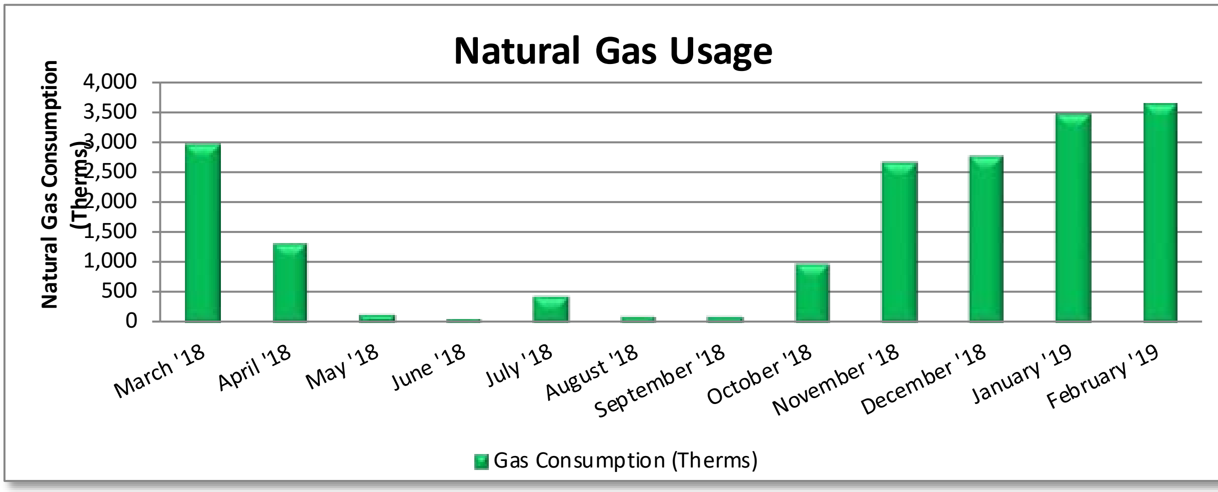
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
3/27/18	30	53,752	199	$1,250	$6,589
4/24/18	28	51,275	183	$1,092	$6,656
5/25/18	31	50,209	136	$791	$6,158
6/26/18	32	51,592	139	$870	$6,478
7/26/18	30	52,333	136	$851	$6,569
8/27/18	32	51,957	144	$902	$6,526
9/26/18	30	55,135	179	$1,139	$6,738
10/25/18	29	45,615	177	$1,048	$6,154
11/27/18	33	38,473	153	$897	$5,149
12/27/18	30	40,280	180	$1,068	$5,712
1/25/19	29	47,579	227	$1,359	$6,035
2/26/19	32	62,778	182	$1,080	$7,369
Totals	**366**	**600,978**	**227**	**$12,346**	**$76,134**
Annual	**365**	**599,336**	**227**	**$12,313**	**$75,926**

Notes:

- Peak demand of 227 kW occurred in January '19.
- The average electric cost over the past 12 months was $0.127/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

New Jersey Natural Gas delivers natural gas under rate class GSL, with natural gas supply provided by South Jersey Energy, a third-party supplier.



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
4/4/18	30	2,945	$2,610
5/2/18	28	1,327	$1,305
6/4/18	33	141	$532
7/3/18	29	74	$329
8/3/18	31	457	$629
8/29/18	26	104	$353
10/1/18	33	128	$374
11/1/18	31	995	$1,038
12/5/18	34	2,644	$2,304
1/3/19	29	2,744	$3,183
2/2/19	30	3,435	$3,520
3/6/19	32	3,616	$3,457
Totals	**366**	**18,610**	**$19,635**
Annual	**365**	**18,560**	**$19,581**

Notes:

- The average gas cost for the past 12 months is $1.055/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

Benchmarking Score	**57**

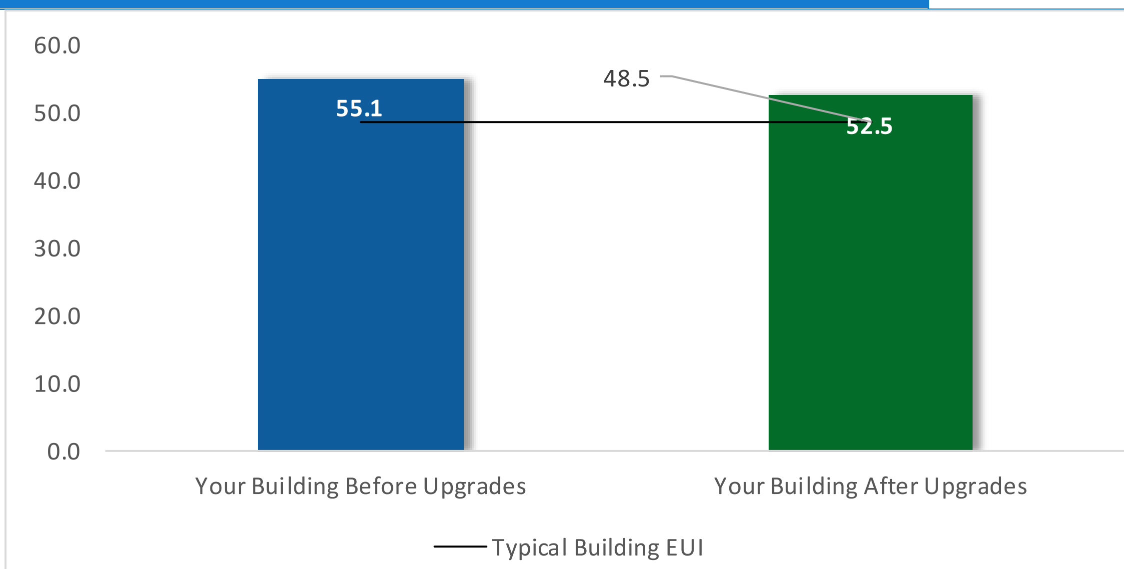


Figure 6 - Energy Use Intensity Comparison

Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance, and lower your energy bills even more.

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause a~~s~~ building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**9,100**	**1.5**	**-1**	**$1,142**	**$3,485**	**$486**	**$2,999**	**2.6**	**9,043**
ECM 1	Retrofit Fixtures with LED Lamps	9,100	1.5	-1	$1,142	$3,485	$486	$2,999	2.6	9,043
Lighting Control Measures		**19,397**	**3.9**	**-4**	**$2,415**	**$16,910**	**$1,420**	**$15,490**	**6.4**	**19,058**
ECM 2	Install Occupancy Sensor Lighting Controls	16,213	3.3	-3	$2,018	$13,310	$1,420	$11,890	5.9	15,930
ECM 3	Install High/Low Lighting Controls	3,184	0.6	-1	$396	$3,600	$0	$3,600	9.1	3,129
Variable Frequency Drive (VFD) Measures		**16,272**	**3.1**	**0**	**$2,061**	**$13,154**	**$600**	**$12,554**	**6.1**	**16,386**
ECM 4	Install VFDs on Constant Volume (CV) Fans	7,759	2.1	0	$983	$4,761	$600	$4,161	4.2	7,813
ECM 5	Install VFDs on Heating Water Pumps	8,513	1.0	0	$1,079	$8,394	$0	$8,394	7.8	8,573
Electric Unitary HVAC Measures		**22,054**	**15.1**	**0**	**$2,794**	**$350,615**	**$7,608**	**$343,007**	**122.8**	**22,208**
ECM 6	Install High Efficiency Air Conditioning Units	22,054	15.1	0	$2,794	$350,615	$7,608	$343,007	122.8	22,208
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**146**	**$1,539**	**$53,358**	**$3,200**	**$50,158**	**32.6**	**17,082**
ECM 7	Install High Efficiency Furnaces	0	0.0	146	$1,539	$53,358	$3,200	$50,158	32.6	17,082
Domestic Water Heating Upgrade		**0**	**0.0**	**44**	**$468**	**$8,826**	**$300**	**$8,526**	**18.2**	**5,197**
ECM 8	Install High Efficiency Gas-Fired Water Heater	0	0.0	13	$138	$8,669	$300	$8,369	60.7	1,530
ECM 9	Install Low-Flow DHW Devices	0	0.0	31	$330	$158	$0	$158	0.5	3,667
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$204**	**$230**	**$50**	**$180**	**0.9**	**1,623**
ECM 10	Vending Machine Control	1,612	0.2	0	$204	$230	$50	$180	0.9	1,623
TOTALS		**68,435**	**23.8**	**185**	**$10,623**	**$446,578**	**$13,664**	**$432,914**	**40.8**	**90,597**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**9,100**	**1.5**	**-1**	**$1,142**	**$3,485**	**$486**	**$2,999**	**2.6**	**9,043**
ECM 1	Retrofit Fixtures with LED Lamps	9,100	1.5	-1	$1,142	$3,485	$486	$2,999	2.6	9,043
Lighting Control Measures		**19,397**	**3.9**	**-4**	**$2,415**	**$16,910**	**$1,420**	**$15,490**	**6.4**	**19,058**
ECM 2	Install Occupancy Sensor Lighting Controls	16,213	3.3	-3	$2,018	$13,310	$1,420	$11,890	5.9	15,930
ECM 3	Install High/Low Lighting Controls	3,184	0.6	-1	$396	$3,600	$0	$3,600	9.1	3,129
Variable Frequency Drive (VFD) Measures		**16,272**	**3.1**	**0**	**$2,061**	**$13,154**	**$600**	**$12,554**	**6.1**	**16,386**
ECM 4	Install VFDs on Constant Volume (CV) Fans	7,759	2.1	0	$983	$4,761	$600	$4,161	4.2	7,813
ECM 5	Install VFDs on Heating Water Pumps	8,513	1.0	0	$1,079	$8,394	$0	$8,394	7.8	8,573
Domestic Water Heating Upgrade		**0**	**0.0**	**31**	**$330**	**$158**	**$0**	**$158**	**0.5**	**3,667**
ECM 9	Install Low-Flow DHW Devices	0	0.0	31	$330	$158	$0	$158	0.5	3,667
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$204**	**$230**	**$50**	**$180**	**0.9**	**1,623**
ECM 10	Vending Machine Control	1,612	0.2	0	$204	$230	$50	$180	0.9	1,623
TOTALS		**46,381**	**8.7**	**26**	**$6,152**	**$33,937**	**$2,556**	**$31,381**	**5.1**	**49,777**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**9,100**	**1.5**	**-1**	**$1,142**	**$3,485**	**$486**	**$2,999**	**2.6**	**9,043**
ECM 1	Retrofit Fixtures with LED Lamps	9,100	1.5	-1	$1,142	$3,485	$486	$2,999	2.6	9,043

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources is proposed, we suggest converting all fixtures of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the Elementary School, which should help reduce future maintenance costs.

ECM 1: Retrofit Fixtures with LED Lamps

Replace fluorescent or CFL lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as direct replacements for most other lighting technologies.

This measure saves energy by installing LEDs, which use less power than other lighting technologies while providing equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: gym with T5 fixtures and smaller spaces with CFL.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**19,397**	**3.9**	**-4**	**$2,415**	**$16,910**	**$1,420**	**$15,490**	**6.4**	**19,058**
ECM 2	Install Occupancy Sensor Lighting Controls	16,213	3.3	-3	$2,018	$13,310	$1,420	$11,890	5.9	15,930
ECM 3	Install High/Low Lighting Controls	3,184	0.6	-1	$396	$3,600	$0	$3,600	9.1	3,129

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 2: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote-mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected building areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms.

ECM 3: Install High/Low Lighting Controls

Install occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low levels after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

The control lowers the light level by dimming the fixture output. Therefore, the controlled fixtures need to have a dimmable ballast or driver. This will need to be taken into account when selecting retrofit lamps and bulbs for the areas proposed for high/low control.

This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

Affected building areas: hallways

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**16,272**	**3.1**	**0**	**$2,061**	**$13,154**	**$600**	**$12,554**	**6.1**	**16,386**
ECM 4	Install VFDs on Constant Volume (CV) Fans	7,759	2.1	0	$983	$4,761	$600	$4,161	4.2	7,813
ECM 5	Install VFDs on Heating Water Pumps	8,513	1.0	0	$1,079	$8,394	$0	$8,394	7.8	8,573

Variable frequency drives (VFDs) control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor to conservatively account for the cost of an inverter duty rated motor.

ECM 4: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone while maintaining a constant supply air temperature.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: AHU.

ECM 5: Install VFDs on Heating Water Pumps

Install VFDs to control heating water pumps. Two-way valves must serve the hot water coils, and the hot water loop must have a differential pressure sensor installed. If three-way valves or a bypass leg are used in the hot water distribution, they will need to be modified when this measure is implemented. As the hot water valves close, the differential pressure increases, and the VFD modulates the pump speed to maintain a differential pressure setpoint.

Energy savings result from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

Affected pumps: HWP 1, HWP 2.

4.4 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**22,054**	**15.1**	**0**	**$2,794**	**$350,615**	**$7,608**	**$343,007**	**122.8**	**22,208**
ECM 6	Install High Efficiency Air Conditioning Units	22,054	15.1	0	$2,794	$350,615	$7,608	$343,007	122.8	22,208

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units at the Elementary School are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high-efficiency unit can be justified by the marginal savings from the improved efficiency. When the packaged and the split AC units is eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 6: Install High-Efficiency Air Conditioning Units

Replace standard efficiency packaged air conditioning units with high-efficiency packaged air conditioning units. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high-efficiency unit, average cooling load, and estimated annual operating hours.

Affected cooling units: part of RTU replacement for RTU 1, 2, 3, 4, 5, 6, 8, 9; older split system units.

4.5 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**146**	**$1,539**	**$53,358**	**$3,200**	**$50,158**	**32.6**	**17,082**
ECM 7	Install High Efficiency Furnaces	0	0.0	146	$1,539	$53,358	$3,200	$50,158	32.6	17,082

ECM 7: Install High-Efficiency Furnaces

Replace standard efficiency furnaces with condensing furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases, which can significantly improve furnace efficiency. Savings result from improved system efficiency.

Note: these units produce acidic condensate that requires proper drainage.

Furnace replacement for these RTU should be considered in parallel with ECM 6 for replacement of the entire package unit.

Affected furnaces: part of RTU replacement for RTU 1, 2, 3, 4, 5, 6, 8, 9.

4.6 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**44**	**$468**	**$8,826**	**$300**	**$8,526**	**18.2**	**5,197**
ECM 8	Install High Efficiency Gas-Fired Water Heater	0	0.0	13	$138	$8,669	$300	$8,369	60.7	1,530
ECM 9	Install Low-Flow DHW Devices	0	0.0	31	$330	$158	$0	$158	0.5	3,667

ECM 8: Install High-Efficiency Gas-Fired Water Heater

Replace the existing tank water heater with a high-efficiency tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water, and fewer operating hours to maintain the tank water temperature.

ECM 9: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low-flow devices are recommended to reduce hot water usage:

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

Low-flow devices reduce the overall water flow from the fixture while still providing adequate pressure for washing. Pre-rinse spray valves (PRSVs)—often used in commercial and institutional kitchens—remove food waste from dishes prior to dishwashing.

Additional cost savings may result from reduced water usage.

4.7 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$204**	**$230**	**$50**	**$180**	**0.9**	**1,623**
ECM 10	Vending Machine Control	1,612	0.2	0	$204	$230	$50	$180	0.9	1,623

ECM 10: Vending Machine Control

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time, and power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[4]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly.

Thermostat Schedules and Temperature Resets

Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan, and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

Furnace Maintenance

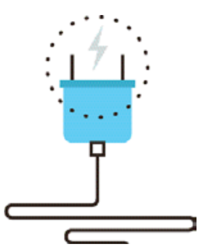
Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should: check for gas / carbon monoxide leaks; change the air and fuel filters; check components for cracks, corrosion, dirt, or debris build-up; ensure the ignition system is working properly; test and adjust operation and safety controls; inspect electrical connections; and lubricate motors and bearings.

Water Heater Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

[5] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

Computer Monitor Replacement

ENERGY STAR® labeled computer monitors can be up to 25% more efficient than standard monitors. ENERGY STAR® rated monitors have power consumption requirements for different operating modes such as on, idle, and sleep.

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense™ website[6] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the Elementary School is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense™ products where available.

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[6] https://www.epa.gov/watersense

[7] https://www.epa.gov/watersense/watersense-work-0

6 On-site Generation

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the Elementary School's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for the Elementary School. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

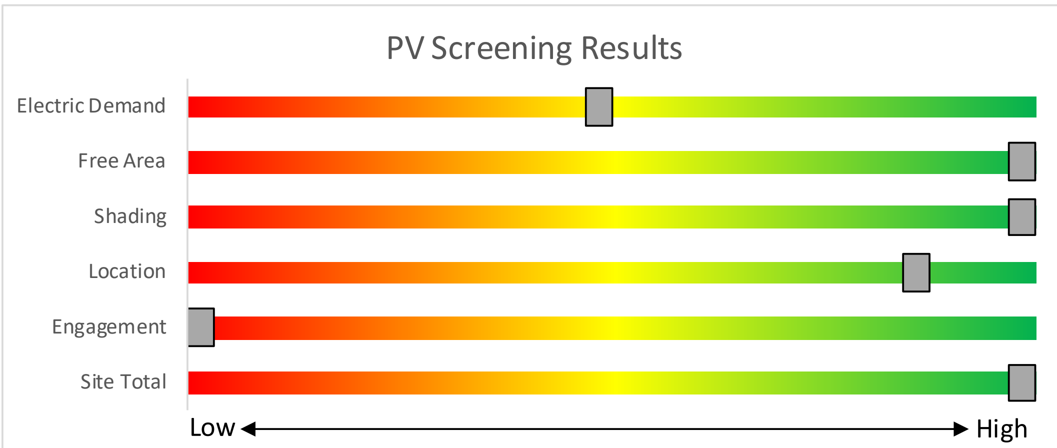
6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has a **high** potential for expanding the PV array.

The amount of free area, ease of installation (roof), and the lack of shading elements contribute to the high potential. A PV array located on the roof may be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	High	
System Potential	121	kW DC STC
Electric Generation	144,156	kWh/yr
Displaced Cost	$18,260	/yr
Installed Cost	$346,100	

Figure 9 - Photovoltaic Screening

Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

- **Basic Info on Solar PV in New Jersey**: www.njcleanenergy.com/whysolar
- **New Jersey Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the New Jersey Market**: www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

6.2 Combined Heat and Power

Combined heat and power (CHP) generate electricity at the Elementary School and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

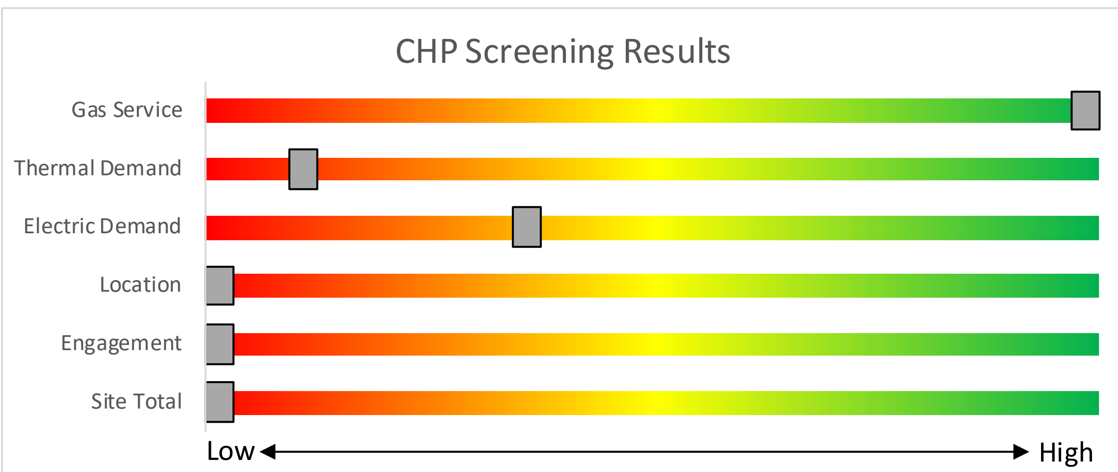
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has **no** potential for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. The lack of gas service, low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	None	
System Type	None	
System Potential	10	kW
Electric Generation	17,168	kWh/yr
Thermal Generation	364,391	MBtu/yr
Displaced Cost	$496	/yr
Installed Cost	$30,000	

Figure 10 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: [http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.](http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/)

7 Project Funding and Incentives

Ready to improve your building's performance? Pick the program that works best for you. Incentive programs that may apply to the Elementary School are identified in the Executive Summary. This section provides an overview of currently available New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for

program details, applications, and to contact a qualified contractor.

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at your facility. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficient equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at the Elementary School, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where the Elementary School is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

The scope of work presented in this audit report does not quite meet the requirements of the current P4P program. However, due to the size of the facility and existing conditions, should additional measures be identified at a later point in time, for example through further evaluation or the Energy Savings Improvement Program process, this facility could potentially meet the requirements necessary to participate in the P4P program.

Incentives

Incentives are based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

Contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan, assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine Fuel Cells with Heat Recovery	>3 MW	$350		
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at: www.njcleanenergy.com/CHP.

7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the energy savings plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.6 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: [www.njcleanenergy.com/srec.](http://www.njcleanenergy.com/srec)

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for the Elementary School's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[8].

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier typically depends on whether a customer prefers budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

[8] www.state.nj.us/bpu/commercial/shopping.html

[9] www.state.nj.us/bpu/commercial/shopping.html

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical room	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Electrical room	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
DHW room	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
MPR	24	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.2	763	0	$95	$540	$70	4.9
MPR	2	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1	Relamp	No	2	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	3,216	0.0	110	0	$14	$69	$4	4.7
MPR stage	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	318	0	$40	$270	$35	5.9
MPR	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MPR storage	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	191	0	$24	$116	$0	4.9
Kitchen	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen storage	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Kitchen office	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Kitchen restroom	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Kitchen restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,216	0.0	0	0	$0	$0	$0	0.0
Vestibules	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Vestibules	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
100 KG	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	477	0	$59	$270	$35	4.0
100 KG	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
100 KG restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,216	0.0	0	0	$0	$0	$0	0.0
101 KG	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	477	0	$59	$270	$35	4.0
101 KG	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
101 KG restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,216	0.0	0	0	$0	$0	$0	0.0
102 KG	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	477	0	$59	$270	$35	4.0
102 KG	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
102 KG restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,216	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	**Fixture Quantity**	**Fixture Description**	**Control System**	**Light Level**	**Watts per Fixture**	**Annual Operating Hours**	**ECM #**	**Fixture Recommendation**	**Add Controls?**	**Fixture Quantity**	**Fixture Description**	**Control System**	**Watts per Fixture**	**Annual Operating Hours**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Total Installation Cost**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
100 KG hallway	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,216	3	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,219	0.0	127	0	$16	$225	$0	14.2
100 KG hallway	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
103 KG	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	318	0	$40	$270	$35	5.9
103 KG	3	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1, 2	Relamp	Yes	3	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	2,219	0.1	285	0	$36	$103	$6	2.7
103 KG	5	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216	2	None	Yes	5	LED Lamps: Screw-in 1 lamp	Occupancy Sensor	10	2,219	0.0	55	0	$7	$270	$35	34.4
103 KG restroom	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Kitchen storage	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Dragon drive hall	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	3	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,219	0.0	95	0	$12	$225	$0	18.9
Main lobby	6	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1	Relamp	No	6	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	3,216	0.1	331	0	$41	$207	$12	4.7
Main entrance	2	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1	Relamp	No	2	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	3,216	0.0	110	0	$14	$69	$4	4.7
Main entrance	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Teachers' lounge	8	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.1	382	0	$48	$270	$35	4.9
Teachers' lounge restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,216	0.0	0	0	$0	$0	$0	0.0
Teachers' lounge hallway	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	3	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,219	0.0	95	0	$12	$225	$0	18.9
Boys 1st floor	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	64	0	$8	$270	$0	34.1
Custodian closet	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Girls 1st floor	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	64	0	$8	$270	$0	34.1
Room 104	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 105	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 106	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 107	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 108	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 109	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Pod hall	18	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	3	None	Yes	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,219	0.1	572	0	$71	$675	$0	9.5
Pod hall	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Vestibule 15	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Vestibule 15	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 110	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 111	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 112	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 113	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 114	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 115	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
110 Pod hall	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	3	None	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,219	0.0	223	0	$28	$225	$0	8.1
110 Pod hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Girls 1st floor	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	64	0	$8	$270	$0	34.1
Boys 1st floor	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	64	0	$8	$270	$0	34.1
Custodian closet	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
125 Electric room	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
116 SGI	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.1	286	0	$36	$270	$35	6.6
14 Vestibule	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
117 SGI	5	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	239	0	$30	$270	$35	7.9
Faculty restroom - Men	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,216	0.0	0	0	$0	$0	$0	0.0
Faculty restroom - Women	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,216	0.0	0	0	$0	$0	$0	0.0
Hall by Vestibule 14	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	3	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,219	0.0	191	0	$24	$225	$0	9.5
Hall by Vestibule 14	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 118	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 119	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 120	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
Room 121	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 122	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	286	0	$36	$270	$35	6.6
120 Pod hall	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	3	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,219	0.1	286	0	$36	$225	$0	6.3
120 Pod hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
123 SGI	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216		None	No	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,216	0.0	0	0	$0	$0	$0	0.0
Media center	31	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	31	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.2	986	0	$123	$540	$70	3.8
Media center	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MC Office	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	95	0	$12	$116	$20	8.1
MC storage	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	95	0	$12	$116	$0	9.8
Boys restroom	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	64	0	$8	$270	$0	34.1
Custodian lounge	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,216	0.0	0	0	$0	$0	$0	0.0
Girls restroom	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	64	0	$8	$270	$0	34.1
Room 123A	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	95	0	$12	$116	$20	8.1
Hall by MPR	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	3	None	Yes	14	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,219	0.1	445	0	$55	$450	$0	8.1
Hall by MPR	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Tech room	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	95	0	$12	$116	$20	8.1
Principal office	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	95	0	$12	$116	$20	8.1
Conference room	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	191	0	$24	$116	$20	4.0
Guidance office	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	95	0	$12	$116	$20	8.1
Main office	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,216	2	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,219	0.0	191	0	$24	$116	$20	4.0
Main office kitchen	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216	2	None	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	95	0	$12	$116	$20	8.1
Main office restroom	1	LED Lamps: Screw-in 1 lamp	Wall Switch	S	10	3,216		None	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	10	3,216	0.0	0	0	$0	$0	$0	0.0
Main office	2	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1	Relamp	No	2	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	3,216	0.0	110	0	$14	$69	$4	4.7
Main office	7	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1, 2	Relamp	Yes	7	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	2,219	0.1	666	0	$83	$511	$49	5.6
New addition - 126 Nurse	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,219		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	0	0	$0	$0	$0	0.0
New addition - 126 Nurse	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0

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Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
126 restroom	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
126 office	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,219		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	0	0	$0	$0	$0	0.0
124 computer lab	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,219		None	No	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	0	0	$0	$0	$0	0.0
124 copy room	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
117 Electrical room	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
118 server room	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
125 Music room	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
127 SGI	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
128 Practice	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,219		None	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	0	0	$0	$0	$0	0.0
115 Music office	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,219		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,219	0.0	0	0	$0	$0	$0	0.0
130 Music room	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
130 Music room	3	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216		None	No	3	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,216	0.0	0	0	$0	$0	$0	0.0
129 SGI	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
5th grade hall	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	3	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,219	0.1	382	0	$48	$450	$0	9.5
5th grade hall	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
5th grade hall	9	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1, 3	Relamp	Yes	9	LED Lamps: 4 pin - 2 lamps	High/Low Control	36	2,219	0.2	856	0	$107	$535	$18	4.9
Vestibule 9	1	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1	Relamp	No	1	LED Lamps: 4 pin - 2 lamps	Wall Switch	36	3,216	0.0	55	0	$7	$34	$2	4.7
Room 131	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.1	382	0	$48	$270	$35	4.9
Room 132	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
133 CR	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
134 art room	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,219		None	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	0	0	$0	$0	$0	0.0
Hall by gym	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,216	3	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,219	0.1	254	0	$32	$225	$0	7.1
Hall by gym	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Hall by gym	7	LED Lamps: Screw-in 2 lamps	Wall Switch	S	20	3,216	3	None	Yes	7	LED Lamps: Screw-in 2 lamps	High/Low Control	20	2,219	0.0	154	0	$19	$225	$0	11.8
Gym	24	Linear Fluorescent - T5HO: 4' T5HO (54W) - 3L	Wall Switch	S	179	3,216	1, 2	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	143	2,219	1.4	6,808	-1	$848	$2,395	$500	2.2

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Gym	7	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	7	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Boys restroom	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	64	0	$8	$270	$0	34.1
Boys restroom	1	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1, 2	Relamp	Yes	1	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	2,219	0.0	95	0	$12	$34	$2	2.7
Girls restroom	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	64	0	$8	$270	$0	34.1
Girls restroom	1	Compact Fluorescent: 4 pin - 2 lamps	Wall Switch	S	52	3,216	1, 2	Relamp	Yes	1	LED Lamps: 4 pin - 2 lamps	Occupancy Sensor	36	2,219	0.0	95	0	$12	$34	$2	2.7
Wall pack	7	Compact Fluorescent: Wall mount - 4 pin - 2 lamps	Timeclock		64	4,380	1	Relamp	No	7	LED Lamps: Wall mount - 4 pin - 2 lamps	Timeclock	45	4,380	0.1	589	0	$75	$241	$14	3.0
Wall pack	12	Compact Fluorescent: Wall mount - 4 pin - 1 lamp	Timeclock		75	4,380	1	Relamp	No	12	LED Lamps: Wall mount - 4 pin - 1 lamp	Timeclock	53	4,380	0.1	1,183	0	$150	$207	$12	1.3
Canopy	6	Compact Fluorescent: Outside door - 4 pin - 1 lamp	Timeclock		32	4,380	1	Relamp	No	6	LED Lamps: Outside door - 4 pin - 1 lamp	Timeclock	22	4,380	0.0	252	0	$32	$103	$6	3.0
Area light	1	Compact Fluorescent: Wall mount - 4 pin - 1 lamp	Timeclock		75	4,380	1	Relamp	No	1	LED Lamps: Wall mount - 4 pin - 1 lamp	Timeclock	53	4,380	0.0	99	0	$12	$17	$1	1.3
Canopy	2	Compact Fluorescent: Screw-in - Door outside - round lamp	Timeclock		52	4,380	1	Relamp	No	2	LED Lamps: Screw-in - Door outside - round lamp	Timeclock	36	4,380	0.0	137	0	$17	$69	$4	3.7
Parking lot	10	Compact Fluorescent: Pole mount - Long circular	Timeclock		64	4,380	1	Relamp	No	10	LED Lamps: Pole mount - Long circular	Timeclock	45	4,380	0.1	841	0	$107	$172	$10	1.5
Parking lot	11	Compact Fluorescent: Pole mount - Long circular	Timeclock		75	4,380	1	Relamp	No	11	LED Lamps: Pole mount - Long circular	Timeclock	53	4,380	0.1	1,084	0	$137	$189	$11	1.3
111 Gym storage	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,216	2	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,219	0.0	191	0	$24	$270	$0	11.4
136 office	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	3,216		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,216	0.0	0	0	$0	$0	$0	0.0

Motor Inventory & Recommendations

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	HWP 1,2	2	Heating Hot Water Pump	5.0	90.2%	No	W	2,745	5	No	90.2%	Yes	2	1.0	8,513	0	$1,079	$8,394	$0	7.8
Boiler room	AHU	1	Supply Fan	7.5	91.7%	No	W	3,391	4	No	91.7%	Yes	1	2.1	7,759	0	$983	$4,761	$600	4.2
Roof	EF	1	Exhaust Fan	0.8	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-6	1	Supply Fan	5.0	89.5%	Yes	B	3,300		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-6	1	Exhaust Fan	3.0	89.5%	Yes	B	3,300		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-9	1	Supply Fan	2.0	86.5%	Yes	B	3,300		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-9	1	Exhaust Fan	1.0	85.5%	Yes	B	3,300		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-5	1	Supply Fan	5.0	89.5%	Yes	B	3,300		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-5	1	Exhaust Fan	5.0	89.5%	Yes	B	3,300		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-3	1	Supply Fan	7.5	91.7%	No	B	3,300		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-3	1	Exhaust Fan	1.0	85.5%	No	B	3,300		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-1	1	Supply Fan	7.5	91.7%	No	B	3,300		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-1	1	Exhaust Fan	1.0	85.5%	No	B	3,300		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-2	1	Supply Fan	10.0	91.7%	No	B	3,300		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-2	1	Exhaust Fan	1.5	86.5%	No	B	3,300		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-8	1	Supply Fan	1.0	85.5%	Yes	B	3,300		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-8	1	Exhaust Fan	1.0	85.5%	Yes	B	3,300		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-4	1	Supply Fan	5.0	89.5%	No	B	3,300		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-4	1	Exhaust Fan	1.0	85.5%	No	B	3,300		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-4	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Gym Storage	DHW Recirculation	1	Water Supply Pump	0.1	60.0%	No	W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Various spaces	Various spaces	8	Supply Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Various spaces	10	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Wall hung	1	Electric Resistance Heat		10.23	W		No							0.0	0	0	$0	$0	$0	0.0
Electrical room	Wall hung	1	Electric Resistance Heat		10.23	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	125-Electrical room	1	Split-System AC	1.00		B	6	Yes	1	Split-System AC	1.00		14.00		0.1	185	0	$23	$1,496	$92	59.8
Roof	117 Electrical room	1	Split-System AC	1.00		B	6	Yes	1	Split-System AC	1.00		14.00		0.1	185	0	$23	$1,496	$92	59.8
Roof	118-Server room	1	Split-System AC	1.00		B	6	Yes	1	Split-System AC	1.00		14.00		0.1	185	0	$23	$1,496	$92	59.8
Roof	Unknown	1	Split-System AC	3.00		B	6	Yes	1	Split-System AC	3.00		14.00		0.5	751	0	$95	$4,489	$276	44.3
Roof	Gym - RTU-6	1	Packaged AC	13.00		B	6	Yes	1	Packaged AC	13.00		11.50		1.4	2,085	0	$264	$18,120	$1,027	64.7
Roof	New Hall - RTU-9	1	Packaged AC	18.00		B	6	Yes	1	Packaged AC	18.00		11.50		2.0	2,887	0	$366	$25,089	$1,422	64.7
Roof	5th grade hallway - RTU-5	1	Packaged AC	25.00		B	6	Yes	1	Packaged AC	25.00		10.50		1.5	2,195	0	$278	$42,185	$1,975	144.6
Roof	RTU-3	1	Packaged AC	30.00		B	6	Yes	1	Packaged AC	30.00		10.00		2.0	2,920	0	$370	$66,479	$0	179.7
Roof	RTU-1	1	Packaged AC	20.00		B	6	Yes	1	Packaged AC	20.00		10.50		1.9	2,781	0	$352	$33,748	$1,580	91.3
Roof	Office	1	Split-System AC	2.00		B	6	Yes	1	Split-System AC	2.00		14.00		0.3	371	0	$47	$2,992	$184	59.8
Roof	RTU-2	1	Packaged AC	30.00		B	6	Yes	1	Packaged AC	30.00		10.00		2.0	2,920	0	$370	$66,479	$0	179.7
Roof	Library and Computer lab RTU-8	1	Packaged AC	10.00		B	6	Yes	1	Packaged AC	10.00		10.50		1.0	1,390	0	$176	$17,821	$730	97.0
Roof	RTU-4	1	Packaged AC	30.00		B	6	Yes	1	Packaged AC	30.00		10.00		2.0	2,920	0	$370	$66,479	$0	179.7
Roof	Office	1	Split-System AC	1.50		B	6	Yes	1	Split-System AC	1.50		14.00		0.2	278	0	$35	$2,244	$138	59.8
Upper roof	Cafeteria	4	Packaged AC	7.00		N		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	30	Electric Resistance Heat		3.41	W		No							0.0	0	0	$0	$0	$0	0.0
Mechanical room, Electrical room, kitchen storage and DHW room	Mechanical room, Electrical room, kitchen storage and DHW room	5	Electric Resistance Heat		10.23	W		No							0.0	0	0	$0	$0	$0	0.0

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Boiler 1,2	2	Non-Condensing Hot Water Boiler	849.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	RTU-6	1	Furnace	146.00	B	7	Yes	1	Furnace	146.00	95.00%	AFUE	0.0	0	9	$92	$3,308	$400	31.4
Roof	RTU-1	1	Furnace	350.00	B	7	Yes	1	Furnace	350.00	95.00%	AFUE	0.0	0	21	$222	$7,930	$400	34.0
Roof	RTU-3	1	Furnace	475.00	B	7	Yes	1	Furnace	475.00	95.00%	AFUE	0.0	0	29	$301	$10,762	$400	34.4
Roof	RTU-2	1	Furnace	500.00	B	7	Yes	1	Furnace	500.00	95.00%	AFUE	0.0	0	30	$317	$11,329	$400	34.5
Roof	RTU-8	1	Furnace	146.00	B	7	Yes	1	Furnace	146.00	95.00%	AFUE	0.0	0	10	$100	$3,308	$400	29.0
Roof	RTU-4	1	Furnace	300.00	B	7	Yes	1	Furnace	300.00	95.00%	AFUE	0.0	0	20	$206	$6,797	$400	31.0
Roof	RTU-9	1	Furnace	219.00	B	7	Yes	1	Furnace	219.00	95.00%	AFUE	0.0	0	14	$150	$4,962	$400	30.3
Roof	RTU-5	1	Furnace	219.00	B	7	Yes	1	Furnace	219.00	95.00%	AFUE	0.0	0	14	$150	$4,962	$400	30.3

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Old section	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler room	New section	1	Storage Tank Water Heater (> 50 Gal)	B	8	Yes	1	Storage Tank Water Heater (> 50 Gal)	Natural Gas	90.00%	Et	0.0	0	13	$138	$8,669	$300	60.7

Low-Flow Device Recommendations

	Recommendation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	9	22	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	31	$330	$158	$0	0.5

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)		No	No	No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Medium Temp Freezer (0F to 30F)		No	No	No	0.0	0	0	$0	$0	$0	0.0

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Refrigerator Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Refrigerator Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Refrigerator Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Convection Oven (Half Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Half Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Insulated Food Holding Cabinet (1/2 Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

Location	Existing Conditions			
	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Lillian M. Dunfee ES	133	Desktop Computer	145.0	Yes
Lillian M. Dunfee ES	10	Chrome book carts	40.0	Yes
Lillian M. Dunfee ES	6	Servers	1,200.0	Yes
Lillian M. Dunfee ES	14	Printer Small	60.0	Yes
Lillian M. Dunfee ES	3	Printer Medium	80.0	Yes
Lillian M. Dunfee ES	5	Printer Big	200.0	Yes
Lillian M. Dunfee ES	35	Projector	200.0	Yes
Lillian M. Dunfee ES	3	Microwave	900.0	Yes
Lillian M. Dunfee ES	1	Refrigerator Small	60.0	Yes
Lillian M. Dunfee ES	1	Refrigerator Medium	80.0	Yes
Lillian M. Dunfee ES	4	Refrigerator Large	220.0	Yes
Lillian M. Dunfee ES	2	Toaster oven	1,200.0	Yes
Lillian M. Dunfee ES	3	Portable fan	60.0	Yes
Lillian M. Dunfee ES	5	Television - CRT	120.0	Yes
Lillian M. Dunfee ES	2	Television- LCD	100.0	Yes
Lillian M. Dunfee ES	1	Hot and Cold Dispenser	520.0	Yes
Lillian M. Dunfee ES	3	Steam Tables	1,500.0	Yes
Lillian M. Dunfee ES	35	Smart Board	5.0	Yes
Lillian M. Dunfee ES	1	Kiln	11,520.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Teacher's lounge	1	Refrigerated	10	Yes	0.2	1,612	0	$204	$230	$50	0.9

Appendix B: ENERGY STAR® Statement of Energy Performance

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

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ENERGY STAR® Statement of Energy Performance

57

ENERGY STAR® Score[1]

Lillian M Dunfee Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 70,817
Built: 1974

For Year Ending: January 31, 2019
Date Generated: July 30, 2019

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Lillian M Dunfee Elementary School 128 Barnegat Blvd South Barnegat, New Jersey 08005	Barnegat Township School District 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 (____)____-______	Stephen Brennan 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 609-698-5800 SBRENNAN@BARNEGATSCHOOLS.COI

Property ID: 7071644

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
52.7 kBtu/ft²

Source EUI
105.4 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	1,703,015 (46%)	
Electric - Grid (kBtu)	2,027,082 (54%)	

National Median Comparison

National Median Site EUI (kBtu/ft²)	56.4
National Median Source EUI (kBtu/ft²)	113
% Diff from National Median Source EUI	-7%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	296

Signature & Stamp of Verifying Professional

I __________________ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: ________________________Date: ____________

Licensed Professional

_____ __________
,
(____)____-______
____

Professional Engineer Stamp
(if applicable)

Appendix C: Glossary

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gas* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.
gpf	*Gallons per flush*

gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp.
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units.
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp.
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp.
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge.
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of $1/8^{th}$ of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense™	The symbol for water efficiency. The WaterSense™ program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.

Local Government Energy Audit Report

Russell O. Brackman Middle School

October 31, 2019

Prepared for:

Barnegat Township School District
600 Barnegat Boulevard North
Barnegat, New Jersey 08005

Prepared by:

TRC
900 Route 9 North
Woodbridge, New Jersey 07095

Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC Companies Inc. (TRC) reviewed the energy conservation measures and estimates of energy savings were reviewed for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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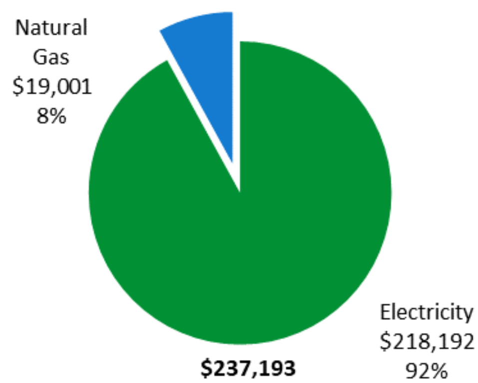
Table of Contents

1 Executive Summary

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Russell O. Brackman Middle School. This report provides you with information about the Middle School's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in the Middle School. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $237,193 Electricity: 1,840,836 kWh Natural Gas: 17,770 Therms	
ENERGY STAR® Benchmarking Score	48 *(1-100 scale)*	This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

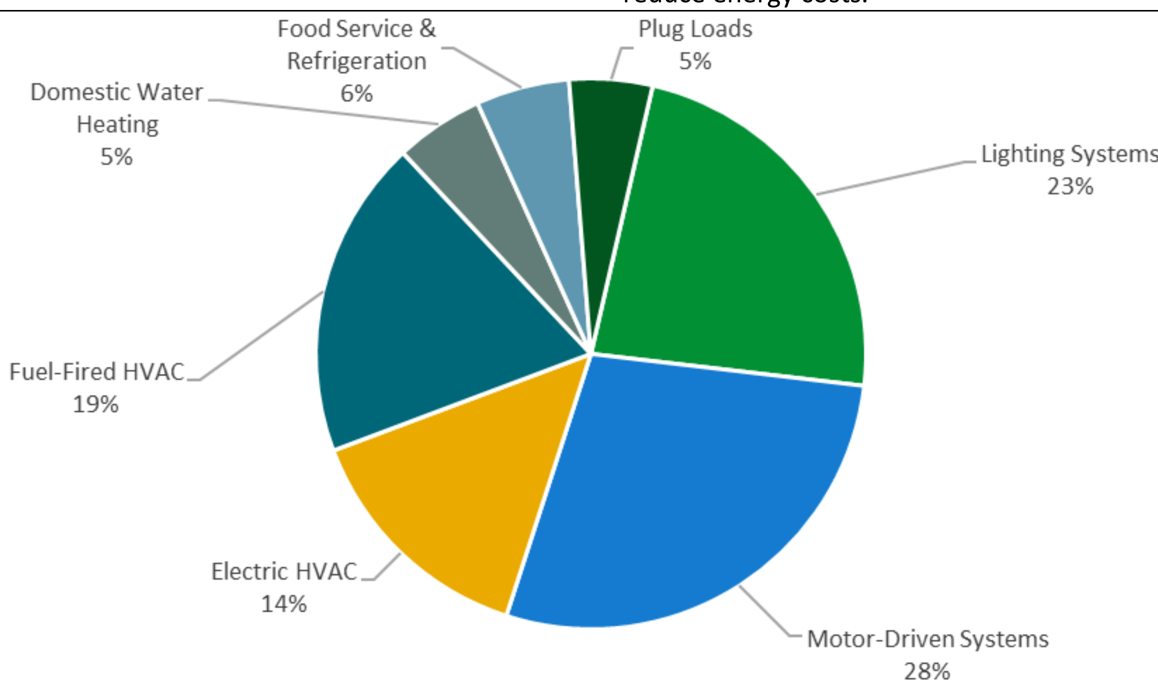


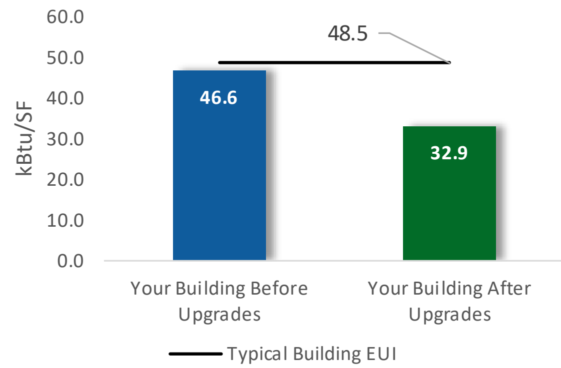
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

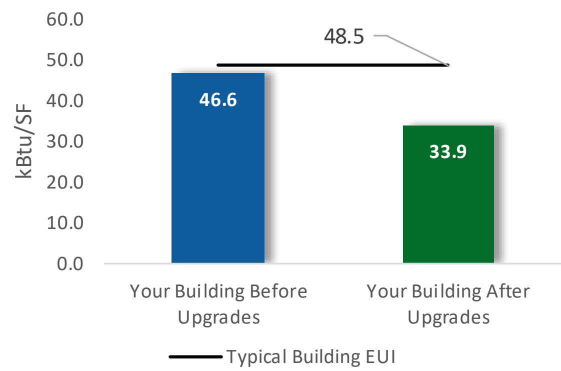
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$640,924
Potential Rebates & Incentives[1]	$44,132
Annual Cost Savings	$80,815
Annual Energy Savings	Electricity: 676,531 kWh Natural Gas: 586 Therms
Greenhouse Gas Emission Savings	344 Tons
Simple Payback	7.4 Years
Site Energy Savings (all utilities)	29%



Scenario 2: Cost Effective Package[2]

Installation Cost	$285,673
Potential Rebates & Incentives	$34,951
Annual Cost Savings	$77,095
Annual Energy Savings	Electricity: 654,111 kWh
Greenhouse Gas Emission Savings	327 Tons
Simple Payback	3.3 Years
Site Energy Savings (all utilities)	27%



On-site Generation Potential

Photovoltaic	Medium
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	*Cost Effective?*	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**326,813**	**61.7**	**-66**	**$38,036**	**$115,119**	**$23,552**	**$91,567**	**2.4**	**321,425**
ECM 1	Install LED Fixtures	Yes	12,525	1.4	0	$1,485	$41,537	$4,300	$37,237	25.1	12,612
ECM 2	Retrofit Fixtures with LED Lamps	Yes	314,288	60.3	-66	$36,552	$73,583	$19,252	$54,331	1.5	308,813
Lighting Control Measures			**63,323**	**10.9**	**-13**	**$7,364**	**$44,240**	**$4,755**	**$39,485**	**5.4**	**62,215**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	56,068	9.6	-12	$6,520	$38,274	$4,755	$33,519	5.1	55,088
ECM 4	Install High/Low Lighting Controls	Yes	7,254	1.2	-2	$844	$5,966	$0	$5,966	7.1	7,127
Variable Frequency Drive (VFD) Measures			**233,009**	**54.1**	**0**	**$27,618**	**$101,042**	**$5,280**	**$95,762**	**3.5**	**234,638**
ECM 5	Install VFDs on Constant Volume (CV) Fans	Yes	56,325	19.0	0	$6,676	$54,247	$5,280	$48,967	7.3	56,719
ECM 6	Install VFDs on Heating Water Pumps	Yes	176,684	35.1	0	$20,942	$46,795	$0	$46,795	2.2	177,920
Electric Unitary HVAC Measures			**44,469**	**20.3**	**0**	**$5,271**	**$297,942**	**$6,425**	**$291,517**	**55.3**	**44,780**
ECM 7	Install High Efficiency Air Conditioning Units	No	22,420	12.1	0	$2,657	$275,162	$5,311	$269,851	101.5	22,577
ECM 8	Install High Efficiency Heat Pumps	Yes	22,049	8.2	0	$2,613	$22,780	$1,114	$21,666	8.3	22,203
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**92**	**$979**	**$37,996**	**$2,400**	**$35,596**	**36.4**	**10,717**
ECM 9	Install High Efficiency Furnaces	No	0	0.0	92	$979	$37,996	$2,400	$35,596	36.4	10,717
Domestic Water Heating Upgrade			**0**	**0.0**	**46**	**$490**	**$42,236**	**$1,470**	**$40,766**	**83.2**	**5,366**
ECM 10	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	8	$84	$42,092	$1,470	$40,622	482.4	922
ECM 11	Install Low-Flow DHW Devices	Yes	0	0.0	38	$406	$143	$0	$143	0.4	4,444
Food Service & Refrigeration Measures			**8,918**	**0.8**	**0**	**$1,057**	**$2,349**	**$250**	**$2,099**	**2.0**	**8,980**
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,237	0.1	0	$147	$910	$0	$910	6.2	1,245
ECM 13	Refrigeration Controls	Yes	1,234	0.0	0	$146	$519	$50	$469	3.2	1,242
ECM 14	Vending Machine Control	Yes	6,447	0.7	0	$764	$920	$200	$720	0.9	6,492
TOTALS (COST EFFECTIVE MEASURES)			**654,111**	**135.7**	**-41**	**$77,095**	**$285,673**	**$34,951**	**$250,722**	**3.3**	**653,906**
TOTALS (ALL MEASURES)			**676,531**	**147.8**	**59**	**$80,815**	**$640,924**	**$44,132**	**$596,792**	**7.4**	**688,122**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	x		x
ECM 2	Retrofit Fixtures with LED Lamps	x		x
ECM 3	Install Occupancy Sensor Lighting Controls	x		x
ECM 4	Install High/Low Lighting Controls			x
ECM 5	Install VFDs on Constant Volume (CV) HVAC	x		x
ECM 6	Install VFDs on Hot Water Pumps			x
ECM 7	Install High Efficiency Electric AC	x		x
ECM 8	Install High Efficiency Heat Pumps	x		x
ECM 9	Install High Efficiency Furnaces	x		x
ECM 10	Install High Efficiency Gas Water Heater	x		x
ECM 11	Install Low-Flow Domestic Hot Water Devices			x
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors			x
ECM 13	Refrigeration Controls	x		x
ECM 14	Vending Machine Control	x		x

Figure 3 – Funding Options

New Jersey's Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility, and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Russell O. Brackman Middle School. This report provides information on how the Middle School uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see **Appendix A: Equipment Inventory & Recommendations.**

2.1 Site Overview

On July 16, 2019, TRC performed an energy audit at Russell O. Brackman Middle School located in Barnegat, New Jersey. TRC met with Neil Piro to review the Middle School operations and help focus our investigation on specific energy-using systems.

Russell O. Brackman Middle School is a two-story, 172,970 square foot building built in 1990. Spaces include: classrooms, a gymnasium, an auditorium, offices, a cafeteria, corridors, stairwells, a commercial kitchen, and a mechanical space.

The Middle School has onsite PV generation on the roof. The building is a 100% heated and cooled.

2.2 Building Occupancy

The Middle School is occupied from September through June. Typical weekday occupancy is approximately 150 staff and 2,182 students.

Building Name	Weekday/Weekend	Operating Schedule
Russell O. Brackman Middle School	Weekday	7:00 AM - 4:00 PM
	Weekend	Saturday: 8:00 AM - 7:00 PM Sunday: 8:00 AM - 9:00 PM (Dec - Feb)

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a concrete block facade. The dividing walls are made of concrete masonry units. The roof is mainly flat, covered with black membrane, and in good condition. Some pitched portions of the roof are made of metal cladding panels.

Most of the windows are double-glazed and have aluminum frames with a thermal break. The glass-to-frame seals are in good condition. Exterior doors have metal reinforced plastic doors and are in good condition.

Facade

Rubber Roof

Windows

Exterior Door

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. Additionally, there are some 26-watt compact fluorescent lamps (CFL). Typically, T8 fluorescent lamps use electronic ballasts.

Fixture types include 2-, 3-, or 4-lamp, 2- or 4-foot long troffers and surface-mounted fixtures and 2-foot fixtures with linear tube lamps. Most fixtures are controlled using wall switches. The gym is lit using T5 high output 4-foot 4-lamp fixtures that are controlled using remote-mounted occupancy sensors, and the auxiliary gym contains LED fixtures. Dimmable halogen-incandescent fixtures are used in the auditorium. Most fixtures are in good condition.

All exit signs are LED units. Interior lighting levels were generally sufficient.

The exterior fixtures consist of 26-watt 4 pin CFL fixtures, 70-watt high pressure sodium wall pack fixtures, and some pole-mounted exterior fixtures. The exterior fixtures are controlled using photocells or timeclocks.

Hallway 4-foot T8 Troffers

Wall-mounted LED Fixture

Pole-mounted LED Fixture

Gym Lighting T5 Fixture

2.5 Air Handling Systems

Unit Ventilators

There are 42-unit ventilators that provide heating and ventilation through supply fan motors with outside air dampers, as well as fan coil valves that operate with a pneumatic control system. This system is original to the building and appears to be in fair operating condition.

Packaged Units

There are six rooftop AAON packaged units serving the classrooms, gym, lobby, and Home Ec. rooms. The units have cooling capacities that range from 10 to 40 tons, with an average EER between 9 and 10. Each of these units have a gas-fired furnace with heating capacity ranging from 146 to 437 MBh. All of the units were installed in 2006 and have been evaluated for replacement. Space temperatures are controlled using an EMS.

Air Conditioners

Various spaces are cooled by 1-ton split AC units. The units have an average EER 10.8. Most of the units are beyond their useful life and have been evaluated for replacement.

Heat pump units

The building is mainly conditioned by distributed water source heat pumps with cooling capacities ranging from 1.5 to 5 tons, and heating capacities ranging from 10 to 120 MBh. Ground water is distributed to the heat pumps by two constant speed 75 hp circulation pumps. The boiler provides supplemental hot water to the loop when needed. The heat pump units have supply fans and EER ratings that range from 10.5 to 14. Zone space temperatures and loop temperatures are controlled by the EMS. The cooling setpoint at the facility is between 68^{o}F to 71^{o}F. A few of these units were replaced in 2019. Others have been evaluated for replacements.

Split AC Unit

Heat Pump Unit

Split AC Unit

Packaged Unit

2.6 Heating Hot Water Systems

Two condensing Laars hot water boilers with a 1020 MBH output capacity and an 85% efficiency provide hot water for the heat pump loop.

Ground water is circulated to the boilers where it is heated as required, and then distributed using one constant speed 7.5 hp pump and four 5 hp pumps to heat pumps located in the respective zones. The boilers also provide heating hot water to several convectors, air handlers, and unit heaters.

Space and loop temperatures are controlled using an EMS. Heating setpoints in the facility is between 71 to 74°F.

Condensing Boilers

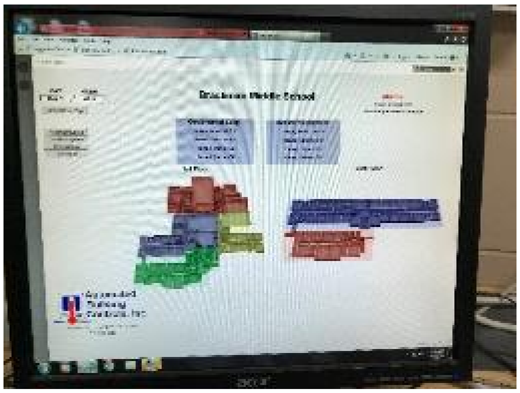
Water-Source Heat Pump Circulation pump

Air Handling Unit

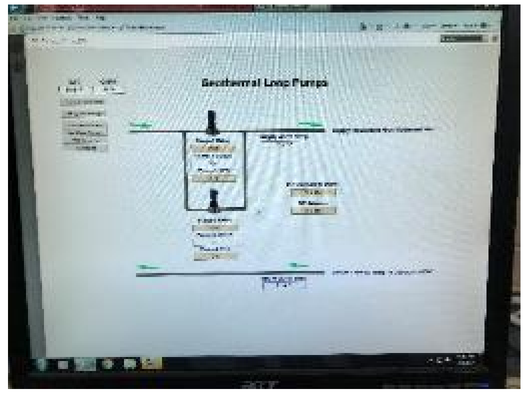
Unit Ventilators

2.7 Building Energy Management Systems (EMS)

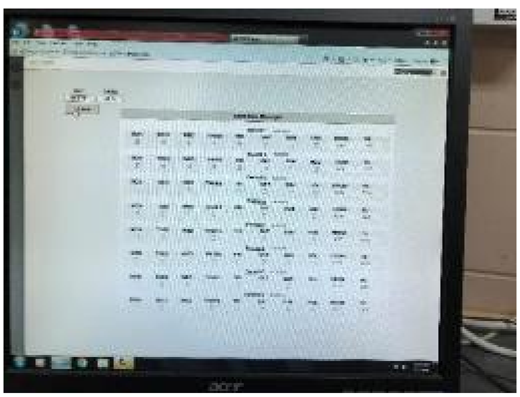
An Automated Building EMS controls the HVAC equipment, boilers, heat pump units, air handlers, and package units. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, and heating water loop temperatures.



Middle School Layout and Loops



Geothermal Loop Pumps



Scheduling

RTU-1 VAV System

2.8 Domestic Hot Water

One gas-fired and two electric water heaters serve the Middle School's domestic hot water needs. The AO Smith gas-fired unit has an input capacity of 420 MBh and a tank capacity of 200 gallons. It is approximately 75% efficient. The unit was installed in 1989 and has been evaluated for replacement. The AO Smith electric units both have an input capacity of 12kW and a tank capacity of 50 gallons.

Hot water is distributed to the end uses using fractional horse power circulating pumps.

Electric DHW

Natural Gas DHW

2.9 Food Service and Refrigeration Equipment

The kitchen has a mix of gas and electric equipment including gas convection oven, steamer, and a griddle that are used to prepare meals for students. Most cooking is done using a convection gas-fired oven. Bulk prepared foods are held in several electric holding cabinets. Equipment is high-efficiency and in good condition.

The kitchen has several stand-up solid door refrigerators. There are also refrigerator and freezer chests. All equipment is standard efficiency and appears to be in good condition.

The walk-in refrigerator has an estimated 1.5-ton compressor and a single-fan evaporator. The walk-in medium temperature freezer has an approximately 2-ton compressor and a two-fan evaporator.

Food Warmer

Freezer Chest

Convection Oven

Pretzel Warmer

2.10 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 5% percent of total building energy use. This is lower than a typical building.

The location is doing a great job managing their electrical plug loads. This report makes additional suggestions for ECMs in this area, as well as Energy Efficient Best Practices.

There are approximately 303 computer work stations throughout the Middle School. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as Smart Boards, projectors, and fans. There are several residential-style refrigerators throughout the building that are used to store food for the staff. These vary in condition and efficiency.

There are four refrigerated beverage vending machines and one non-refrigerated vending machines. Vending machines are not equipped with occupancy-based controls.

2.11 Water-Using Systems

Faucet flow rates are at 1.5 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

2.12 On-Site Generation

Russel O. Brackman Middle School has a photovoltaic (PV) array that was installed in 2011. This system provides approximately 29.1% of the electricity used at this facility.

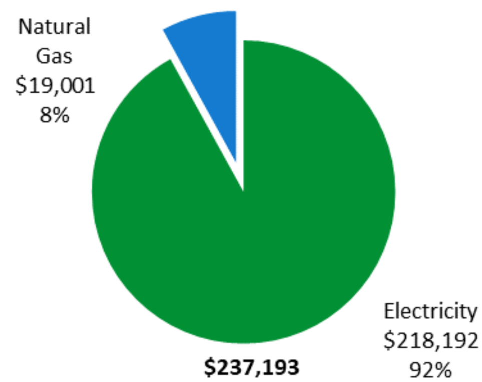
PV Array

PV Array

3 ENERGY USE AND COSTS

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	1,840,836 kWh	$218,192
Natural Gas	17,770 Therms	$19,001
Total		**$237,193**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

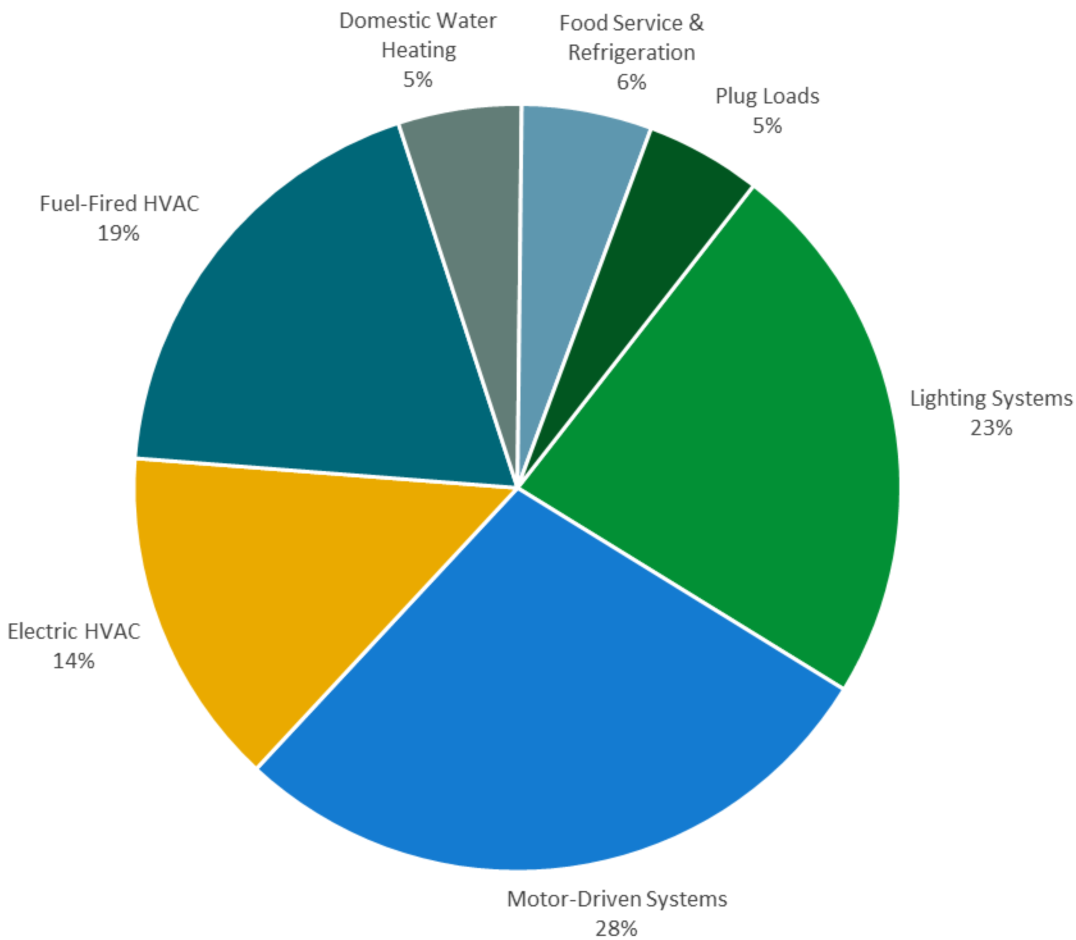
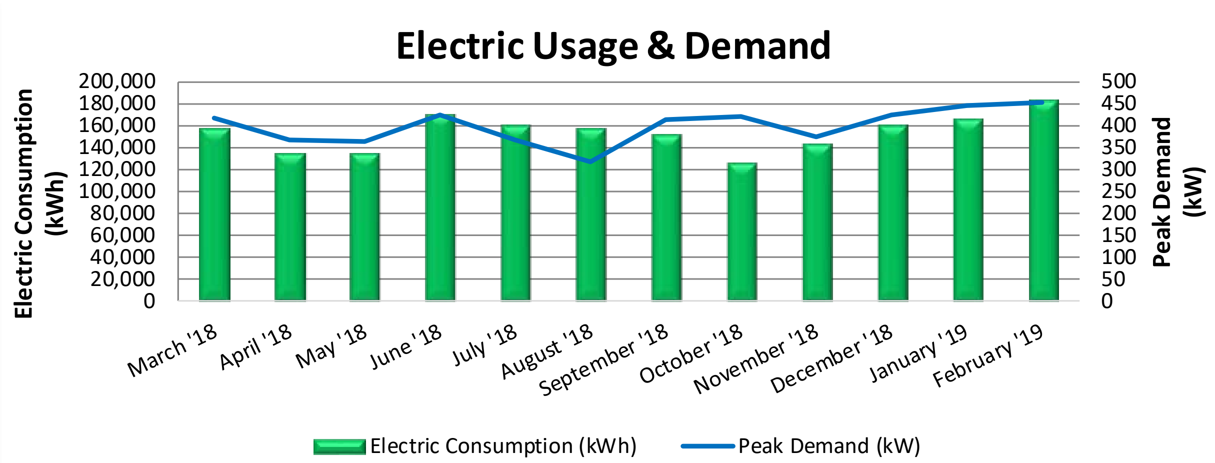


Figure 5 - Energy Balance

3.1 Electricity

JCP&L delivers electricity under rate class GSS, with electric production provided by South Jersey Energy/Tri Eagle Energy, a third-party supplier.



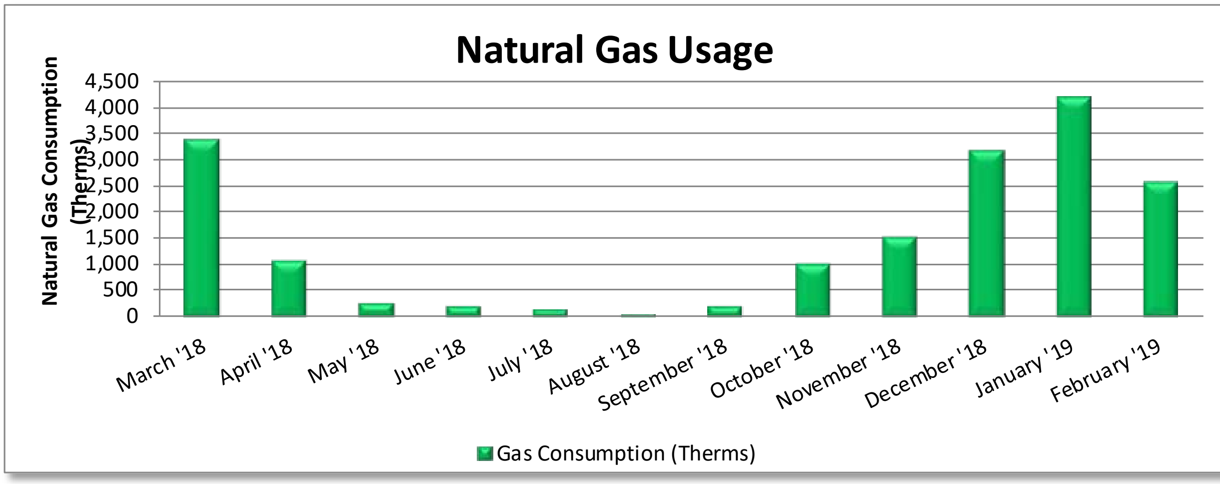
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
3/27/18	30	157,008	418	$2,694	$17,734
4/25/18	29	135,020	366	$2,250	$16,325
5/25/18	30	134,493	365	$2,227	$15,937
6/26/18	32	170,854	423	$2,780	$20,007
7/26/18	30	160,350	368	$2,412	$18,715
8/27/18	32	157,500	318	$2,074	$18,002
9/26/18	30	151,396	412	$2,708	$17,557
10/25/18	29	125,655	421	$2,479	$16,344
11/27/18	33	143,658	373	$2,276	$17,667
12/27/18	30	160,416	424	$2,597	$20,803
1/25/19	29	166,291	446	$2,728	$18,943
2/26/19	32	183,238	452	$2,774	$20,756
Totals	**366**	**1,845,880**	**452**	**$30,001**	**$218,790**
Annual	**365**	**1,840,836**	**452**	**$29,919**	**$218,192**

Notes:

- Peak demand of 452 kW occurred in February '19.
- The average electric cost over the past 12 months was $0.119/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

New Jersey Natural Gas delivers natural gas under rate class GSL, with natural gas supply provided by South Jersey Energy, a third-party supplier.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
4/4/18	30	3,389	$2,955
5/2/18	28	1,054	$1,061
6/1/18	30	270	$497
7/3/18	32	195	$393
8/2/18	30	123	$338
8/28/18	26	34	$269
10/1/18	34	201	$448
11/1/18	31	1,014	$1,071
12/1/18	30	1,503	$1,447
1/2/19	32	3,171	$3,654
2/4/19	33	4,188	$4,250
3/4/19	28	2,580	$2,566
Totals	**364**	**17,721**	**$18,949**
Annual	**365**	**17,770**	**$19,001**

Notes:

- The average gas cost for the past 12 months is $1.069/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

Benchmarking Score	48

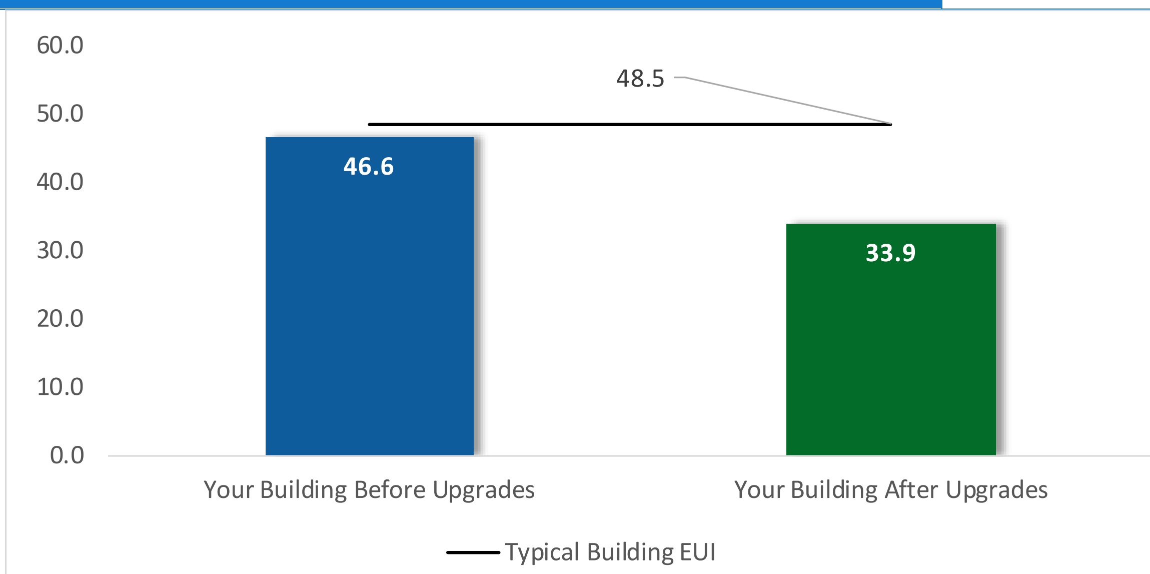


Figure 6 - Energy Use Intensity Comparison

This building performs at, or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause a~~s~~ building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 ENERGY CONSERVATION MEASURES

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**326,813**	**61.7**	**-66**	**$38,036**	**$115,119**	**$23,552**	**$91,567**	**2.4**	**321,425**
ECM 1	Install LED Fixtures	12,525	1.4	0	$1,485	$41,537	$4,300	$37,237	25.1	12,612
ECM 2	Retrofit Fixtures with LED Lamps	314,288	60.3	-66	$36,552	$73,583	$19,252	$54,331	1.5	308,813
Lighting Control Measures		**63,323**	**10.9**	**-13**	**$7,364**	**$44,240**	**$4,755**	**$39,485**	**5.4**	**62,215**
ECM 3	Install Occupancy Sensor Lighting Controls	56,068	9.6	-12	$6,520	$38,274	$4,755	$33,519	5.1	55,088
ECM 4	Install High/Low Lighting Controls	7,254	1.2	-2	$844	$5,966	$0	$5,966	7.1	7,127
Variable Frequency Drive (VFD) Measures		**233,009**	**54.1**	**0**	**$27,618**	**$101,042**	**$5,280**	**$95,762**	**3.5**	**234,638**
ECM 5	Install VFDs on Constant Volume (CV) Fans	56,325	19.0	0	$6,676	$54,247	$5,280	$48,967	7.3	56,719
ECM 6	Install VFDs on Heating Water Pumps	176,684	35.1	0	$20,942	$46,795	$0	$46,795	2.2	177,920
Electric Unitary HVAC Measures		**44,469**	**20.3**	**0**	**$5,271**	**$297,942**	**$6,425**	**$291,517**	**55.3**	**44,780**
ECM 7	Install High Efficiency Air Conditioning Units	22,420	12.1	0	$2,657	$275,162	$5,311	$269,851	101.5	22,577
ECM 8	Install High Efficiency Heat Pumps	22,049	8.2	0	$2,613	$22,780	$1,114	$21,666	8.3	22,203
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**92**	**$979**	**$37,996**	**$2,400**	**$35,596**	**36.4**	**10,717**
ECM 9	Install High Efficiency Furnaces	0	0.0	92	$979	$37,996	$2,400	$35,596	36.4	10,717
Domestic Water Heating Upgrade		**0**	**0.0**	**46**	**$490**	**$42,236**	**$1,470**	**$40,766**	**83.2**	**5,366**
ECM 10	Install High Efficiency Gas-Fired Water Heater	0	0.0	8	$84	$42,092	$1,470	$40,622	482.4	922
ECM 11	Install Low-Flow DHW Devices	0	0.0	38	$406	$143	$0	$143	0.4	4,444
Food Service & Refrigeration Measures		**8,918**	**0.8**	**0**	**$1,057**	**$2,349**	**$250**	**$2,099**	**2.0**	**8,980**
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	1,237	0.1	0	$147	$910	$0	$910	6.2	1,245
ECM 13	Refrigeration Controls	1,234	0.0	0	$146	$519	$50	$469	3.2	1,242
ECM 14	Vending Machine Control	6,447	0.7	0	$764	$920	$200	$720	0.9	6,492
TOTALS		**676,531**	**147.8**	**59**	**$80,815**	**$640,924**	**$44,132**	**$596,792**	**7.4**	**688,122**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**326,813**	**61.7**	**-66**	**$38,036**	**$115,119**	**$23,552**	**$91,567**	**2.4**	**321,425**
ECM 1	Install LED Fixtures	12,525	1.4	0	$1,485	$41,537	$4,300	$37,237	25.1	12,612
ECM 2	Retrofit Fixtures with LED Lamps	314,288	60.3	-66	$36,552	$73,583	$19,252	$54,331	1.5	308,813
Lighting Control Measures		**63,323**	**10.9**	**-13**	**$7,364**	**$44,240**	**$4,755**	**$39,485**	**5.4**	**62,215**
ECM 3	Install Occupancy Sensor Lighting Controls	56,068	9.6	-12	$6,520	$38,274	$4,755	$33,519	5.1	55,088
ECM 4	Install High/Low Lighting Controls	7,254	1.2	-2	$844	$5,966	$0	$5,966	7.1	7,127
Variable Frequency Drive (VFD) Measures		**233,009**	**54.1**	**0**	**$27,618**	**$101,042**	**$5,280**	**$95,762**	**3.5**	**234,638**
ECM 5	Install VFDs on Constant Volume (CV) Fans	56,325	19.0	0	$6,676	$54,247	$5,280	$48,967	7.3	56,719
ECM 6	Install VFDs on Heating Water Pumps	176,684	35.1	0	$20,942	$46,795	$0	$46,795	2.2	177,920
Electric Unitary HVAC Measures		**22,049**	**8.2**	**0**	**$2,613**	**$22,780**	**$1,114**	**$21,666**	**8.3**	**22,203**
ECM 8	Install High Efficiency Heat Pumps	22,049	8.2	0	$2,613	$22,780	$1,114	$21,666	8.3	22,203
Domestic Water Heating Upgrade		**0**	**0.0**	**38**	**$406**	**$143**	**$0**	**$143**	**0.4**	**4,444**
ECM 11	Install Low-Flow DHW Devices	0	0.0	38	$406	$143	$0	$143	0.4	4,444
Food Service & Refrigeration Measures		**8,918**	**0.8**	**0**	**$1,057**	**$2,349**	**$250**	**$2,099**	**2.0**	**8,980**
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	1,237	0.1	0	$147	$910	$0	$910	6.2	1,245
ECM 13	Refrigeration Controls	1,234	0.0	0	$146	$519	$50	$469	3.2	1,242
ECM 14	Vending Machine Control	6,447	0.7	0	$764	$920	$200	$720	0.9	6,492
TOTALS		**654,111**	**135.7**	**-41**	**$77,095**	**$285,673**	**$34,951**	**$250,722**	**3.3**	**653,906**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**326,813**	**61.7**	**-66**	**$38,036**	**$115,119**	**$23,552**	**$91,567**	**2.4**	**321,425**
ECM 1	Install LED Fixtures	12,525	1.4	0	$1,485	$41,537	$4,300	$37,237	25.1	12,612
ECM 2	Retrofit Fixtures with LED Lamps	314,288	60.3	-66	$36,552	$73,583	$19,252	$54,331	1.5	308,813

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources is proposed, we suggest converting all fixtures of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the Middle School, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

Replace existing fixtures containing HID lamps with new LED light fixtures. This measure saves energy by installing LEDs, which use less power than other technologies with a comparable light output.

In some cases, HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixture(s).

Maintenance savings may also be achieved, as LED lamps last longer than other light sources and therefore do not need to be replaced as often.

Affected building areas: exterior fixtures.

ECM 2: Retrofit Fixtures with LED Lamps

Replace fluorescent, CFL, or halogen incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as direct replacements for most other lighting technologies.

This measure saves energy by installing LEDs, which use less power than other lighting technologies while providing equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes, CFL, and halogen incandescent lamps.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**63,323**	**10.9**	**-13**	**$7,364**	**$44,240**	**$4,755**	**$39,485**	**5.4**	**62,215**
ECM 3	Install Occupancy Sensor Lighting Controls	56,068	9.6	-12	$6,520	$38,274	$4,755	$33,519	5.1	55,088
ECM 4	Install High/Low Lighting Controls	7,254	1.2	-2	$844	$5,966	$0	$5,966	7.1	7,127

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 3: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote-mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected building areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms.

ECM 4: Install High/Low Lighting Controls

Install occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low levels after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

The control lowers the light level by dimming the fixture output. Therefore, the controlled fixtures need to have a dimmable ballast or driver. This will need to be taken into account when selecting retrofit lamps and bulbs for the areas proposed for high/low control.

This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

Affected building areas: hallways.

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**233,009**	**54.1**	**0**	**$27,618**	**$101,042**	**$5,280**	**$95,762**	**3.5**	**234,638**
ECM 5	Install VFDs on Constant Volume (CV) Fans	56,325	19.0	0	$6,676	$54,247	$5,280	$48,967	7.3	56,719
ECM 6	Install VFDs on Heating Water Pumps	176,684	35.1	0	$20,942	$46,795	$0	$46,795	2.2	177,920

Variable frequency drives (VFDs) control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor to conservatively account for the cost of an inverter duty rated motor.

Premium efficiency motors have been proposed to be installed only in conjunction with proposed VFD motor measures. Non-inverter duty rated motors will need to be replaced when the VFD measure is implemented.

ECM 5: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone while maintaining a constant supply air temperature.

VAV system controls should not raise the supply air temperature at the expense of the fan power. A common mistake is to reset the supply air temperature to achieve chiller energy savings, which can lead to additional air flow requirements. Supply air temperature should be kept low (e.g. 55°F) until the minimum fan speed (typically about 50%) is met. At this point, it is efficient to raise the supply air temperature as the load decreases, but not such that additional air flow and thus fan energy is required.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: AHU 1A-1B, AHU 2A-2B, AHU 1D, ERV-4, RTU-4, ERV-5B, HP-1 Cafeteria.

ECM 6: Install VFDs on Heating Water Pumps

Install VFDs to control heating water pumps. Two-way valves must serve the hot water coils, and the hot water loop must have a differential pressure sensor installed. If three-way valves or a bypass leg are used in the hot water distribution, they will need to be modified when this measure is implemented. As the hot water valves close, the differential pressure increases, and the VFD modulates the pump speed to maintain a differential pressure setpoint.

Energy savings result from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

Affected pumps: 75 hp geothermal water pump.

4.4 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**44,469**	**20.3**	**0**	**$5,271**	**$297,942**	**$6,425**	**$291,517**	**55.3**	**44,780**
ECM 7	Install High Efficiency Air Conditioning Units	22,420	12.1	0	$2,657	$275,162	$5,311	$269,851	101.5	22,577
ECM 8	Install High Efficiency Heat Pumps	22,049	8.2	0	$2,613	$22,780	$1,114	$21,666	8.3	22,203

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units at the Middle School are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high-efficiency unit can be justified by the marginal savings from the improved efficiency. When the split AC units, packaged units and water source heat pumps is eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 7: Install High-Efficiency Air Conditioning Units

Replace standard efficiency packaged air conditioning units with high-efficiency packaged air conditioning units. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high-efficiency unit, average cooling load, and estimated annual operating hours.

ECM 8: Install High-Efficiency Heat Pumps

Replace standard efficiency heat pumps with high-efficiency heat pumps. A higher EER or SEER rating indicates a more efficient cooling system and a higher HSPF rating indicates more efficient heating mode. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high-efficiency unit, average heating and cooling loads, and estimated annual operating hours.

4.5 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**92**	**$979**	**$37,996**	**$2,400**	**$35,596**	**36.4**	**10,717**
ECM 9	Install High Efficiency Furnaces	0	0.0	92	$979	$37,996	$2,400	$35,596	36.4	10,717

ECM 9: Install High-Efficiency Furnaces

Replace standard efficiency furnaces with condensing furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases, which can significantly improve furnace efficiency. Savings result from improved system efficiency.

4.6 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**46**	**$490**	**$42,236**	**$1,470**	**$40,766**	**83.2**	**5,366**
ECM 10	Install High Efficiency Gas-Fired Water Heater	0	0.0	8	$84	$42,092	$1,470	$40,622	482.4	922
ECM 11	Install Low-Flow DHW Devices	0	0.0	38	$406	$143	$0	$143	0.4	4,444

ECM 10: Install High-Efficiency Gas-Fired Water Heater

Replace the existing tank water heater with a high-efficiency tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water, and fewer operating hours to maintain the tank water temperature.

ECM 11: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low-flow devices are recommended to reduce hot water usage:

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing. Pre-rinse spray valves—often used in commercial and institutional kitchens—remove food waste from dishes prior to dishwashing.

Additional cost savings may result from reduced water usage.

4.7 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**8,918**	**0.8**	**0**	**$1,057**	**$2,349**	**$250**	**$2,099**	**2.0**	**8,980**
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	1,237	0.1	0	$147	$910	$0	$910	6.2	1,245
ECM 13	Refrigeration Controls	1,234	0.0	0	$146	$519	$50	$469	3.2	1,242
ECM 14	Vending Machine Control	6,447	0.7	0	$764	$920	$200	$720	0.9	6,492

ECM 12: Refrigerator/Freezer Case Electrically Commutated Motors

Replace shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in walk-in coolers and freezers. Fractional horsepower EC motors are significantly more efficient than mechanically commutated, brushed motors, particularly at low speeds or partial load. By using variable-speed technology, EC motors can optimize fan usage. Because these motors are brushless and use DC power, losses due to friction and phase shifting are eliminated.

Savings for this measure consider both the increased efficiency of the motor, as well as the reduction in refrigeration load due to motor heat loss.

ECM 13: Refrigeration Controls

Install additional controls to optimize the operation of walk-in coolers and freezers.

Many walk-in coolers and freezers have evaporator fans that run continuously. The measure adds a control system feature to automatically shut off evaporator fans when not needed.

Energy savings for each of the control measures account for reduction in compressor and fan operating hours, as well as reduction in the refrigeration heat load as appropriate.

ECM 14: Vending Machine Control

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time and power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

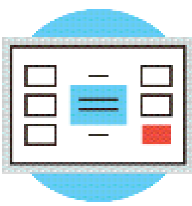
5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[4]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Thermostat Schedules and Temperature Resets



Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less, and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

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[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

Furnace Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should: check for gas / carbon monoxide leaks; change the air and fuel filters; check components for cracks, corrosion, dirt, or debris build-up; ensure the ignition system is working properly; test and adjust operation and safety controls; inspect electrical connections; and lubricate motors and bearings.

Water Heater Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Plug Load Controls

Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

[5] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense™ website[6] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the Middle School is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense™ products where available.

[6] https://www.epa.gov/watersense

[7] https://www.epa.gov/watersense/watersense-work-0

6 ON-SITE GENERATION

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the facility's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for your facility. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

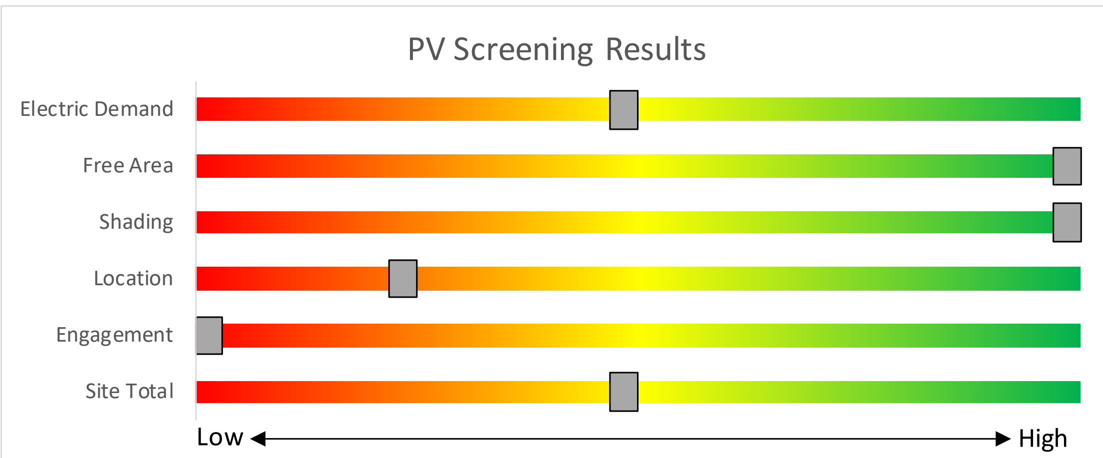
6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has **medium** potential for installing a PV array.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the medium potential. A PV array located in the parking lot be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	Medium	
System Potential	399	kW DC STC
Electric Generation	475,357	kWh/yr
Displaced Cost	$56,340	/yr
Installed Cost	$1,348,600	

Figure 9 - Photovoltaic Screening

Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

- **Basic Info on Solar PV in New Jersey**: www.njcleanenergy.com/whysolar
- **New Jersey Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the New Jersey Market**: www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

6.2 Combined Heat and Power

Combined heat and power (CHP) generate electricity at the Middle School and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

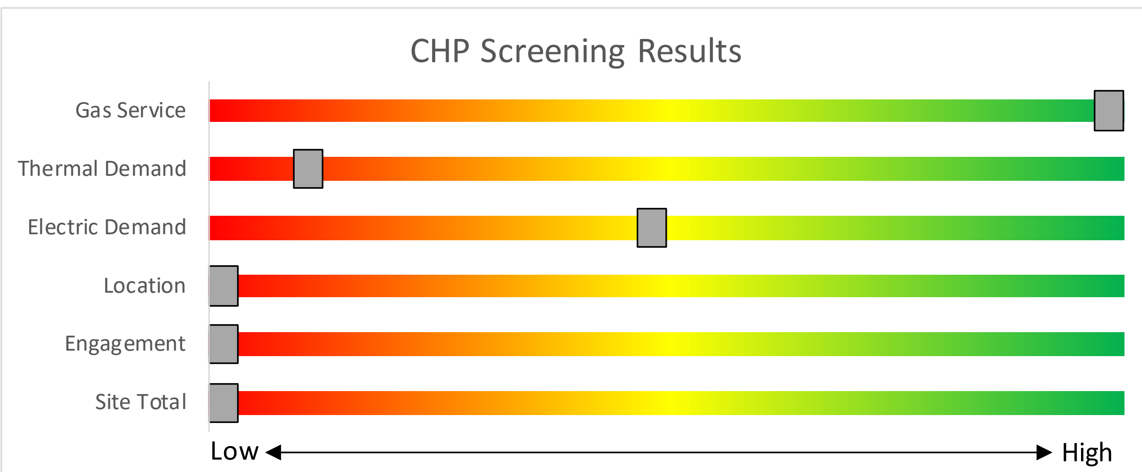
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has **no** potential for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. Low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	None	
System Type	None	
System Potential	10	kW
Electric Generation	21,460	kWh/yr
Thermal Generation	437,784	MBtu/yr
Displaced Cost	$492	/yr
Installed Cost	$38,000	

Figure 10 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

7 Project Funding and Incentives

Ready to improve your building's performance? Pick the program that works best for you. Incentive programs that may apply to the Middle School are identified in the Executive Summary. This section provides an overview of currently available New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at your facility. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficient equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

- *Electric Chillers*
- *Electric Unitary HVAC*
- *Gas Cooling*
- *Gas Heating*
- *Gas Water Heating*
- *Ground Source Heat Pumps*
- *Lighting*
- *Lighting Controls*
- *Refrigeration Doors*
- *Refrigeration Controls*
- *Refrigerator/Freezer Motors*
- *Food Service Equipment*
- *Variable Frequency Drives*

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

Incentives

Incentives are based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

Contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan, assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine	>3 MW	$350		
Fuel Cells with Heat Recovery				
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at: [www.njcleanenergy.com/CHP.](http://www.njcleanenergy.com/CHP)

7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the energy savings plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.6 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: [www.njcleanenergy.com/srec.](www.njcleanenergy.com/srec)

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[8].

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier typically depends on whether a customer prefers budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

[8] www.state.nj.us/bpu/commercial/shopping.html

[9] www.state.nj.us/bpu/commercial/shopping.html

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Cafeteria fan room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
N220 Teachers lounge	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
N220 restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,848	0.0	68	0	$8	$33	$6	3.4
CR S234	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S235	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	355	0	$41	$189	$20	4.1
Girls 2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Girls 2nd floor	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2, 3	Relamp	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,655	0.0	90	0	$10	$33	$6	2.5
Boys 2nd floor	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Boys 2nd floor	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2, 3	Relamp	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,655	0.0	90	0	$10	$33	$6	2.5
Electrical room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
CR S232	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S233	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S231B	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,422	0	$165	$562	$115	2.7
CR S230	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S231A	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,422	0	$165	$562	$115	2.7
CR S228	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S229	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
S Hallway - 2nd floor	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.3	1,600	0	$186	$554	$90	2.5
S Hallway - 2nd floor	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR S226	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S227	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
N209	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
N209 Hall	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.1	533	0	$62	$226	$30	3.2
N209 Hall	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	355	0	$41	$189	$20	4.1
CR N210	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
Girls 2nd floor - N side	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Girls 2nd floor - N side	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Boys 2nd floor - N side	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Boys 2nd floor - N side	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	355	0	$41	$189	$20	4.1
CR N212	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N211	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N214	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,844	-1	$331	$854	$195	2.0
CR N213	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N216	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N215	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
N Hall 2nd floor	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.3	1,600	0	$186	$554	$90	2.5
N Hall 2nd floor	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
N218 Book room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N217	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N219	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
Custodian	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
CR N221	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	3,199	-1	$372	$927	$215	1.9
N221 closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
CR N222	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.6	3,555	-1	$413	$1,270	$270	2.4
N222 prep room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	711	0	$83	$262	$60	2.4
CR S223	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	3,199	-1	$372	$927	$215	1.9
S223 storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,240	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,240	0.0	68	0	$8	$55	$15	5.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR S225	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
S224 Science lab	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.6	3,555	-1	$413	$1,270	$270	2.4
S224 prep room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.2	1,066	0	$124	$335	$80	2.1
N Hall 2nd floor	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.7	3,910	-1	$455	$1,478	$220	2.8
N Hall 2nd floor	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Mechanical room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
Center mechanical room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.1	419	0	$49	$110	$30	1.6
Electrical room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,848	0.1	419	0	$49	$110	$30	1.6
Hall by west side	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.3	1,600	0	$186	$554	$90	2.5
Hall by west side	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
CR W 208	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.7	3,999	-1	$465	$1,092	$260	1.8
CR W 206	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
N 207 lab	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	3,199	-1	$372	$1,197	$250	2.5
N 207 prep room	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.4	2,399	-1	$279	$763	$170	2.1
N207 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.1	115	0	$13	$189	$20	12.7
W 205 lab	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.6	3,555	-1	$413	$1,270	$270	2.4
W204	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
W202 A	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.3	1,600	0	$186	$599	$125	2.5
W202 B	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
W203 lab	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.6	3,732	-1	$434	$1,307	$280	2.4
201/203 prep room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.3	1,600	0	$186	$599	$125	2.5
201/203 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.1	115	0	$13	$189	$20	12.7
N201 lab	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.8	4,799	-1	$558	$1,526	$340	2.1
W200 teachers lounge	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
Girls 2nd floor W side	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	711	0	$83	$416	$75	4.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	**Fixture Quantity**	**Fixture Description**	**Control System**	**Light Level**	**Watts per Fixture**	**Annual Operating Hours**	**ECM #**	**Fixture Recommendation**	**Add Controls?**	**Fixture Quantity**	**Fixture Description**	**Control System**	**Watts per Fixture**	**Annual Operating Hours**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Total Installation Cost**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
Girls 2nd floor W side	1	Compact Fluorescent: 4-pin 1 lamp	Wall Switch	S	26	3,848	2, 3	Relamp	Yes	1	LED Lamps: 4-pin 1 lamp	Occupancy Sensor	18	2,655	0.0	57	0	$7	$17	$1	2.5
Boys 2nd floor W side	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	711	0	$83	$416	$75	4.1
Boys 2nd floor W side	1	Compact Fluorescent: 4-pin 1 lamp	Wall Switch	S	26	3,848	2, 3	Relamp	Yes	1	LED Lamps: 4-pin 1 lamp	Occupancy Sensor	18	2,655	0.0	57	0	$7	$17	$1	2.5
Custodian closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,240	0.0	45	0	$5	$37	$10	5.1
Storage closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.1	115	0	$13	$189	$20	12.7
W side 2nd floor hall	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.4	2,311	0	$269	$925	$130	3.0
W side 2nd floor hall	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairwell 1	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.1	838	0	$97	$219	$60	1.6
Stairwell 1	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Maintenance boiler room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.1	838	0	$97	$219	$60	1.6
Maintenance boiler room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Pump room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.1	838	0	$97	$219	$60	1.6
Electrical room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.1	559	0	$65	$146	$40	1.6
Custodian lounge	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.6	3,732	-1	$434	$1,307	$280	2.4
Generator room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
Main gym	24	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Occupancy Sensor	S	120	2,655	2	Relamp	No	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,655	1.1	4,346	-1	$505	$1,753	$480	2.5
Main gym	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main gym	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
BLR Coach office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	355	0	$41	$189	$20	4.1
BLR Coach office restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
Boys locker room	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
BLR storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
GLR Coach office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	355	0	$41	$189	$20	4.1
GLR restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
Girls locker room	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	3,199	-1	$372	$927	$215	1.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Gym storage	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,244	0	$145	$372	$70	2.1
Music storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.2	286	0	$33	$299	$50	7.5
Auxillary gym	15	LED - Fixtures: High-Bay	Wall Switch	S	15	3,848		None	No	15	LED - Fixtures: High-Bay	Wall Switch	15	3,848	0.0	0	0	$0	$0	$0	0.0
Auxillary gym	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Auxillary gym storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,240	0.0	45	0	$5	$37	$10	5.1
Auxillary gym storage 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.1	172	0	$20	$226	$30	9.8
Cafeteria	50	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	50	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	1.5	8,887	-2	$1,033	$3,176	$675	2.4
Cafeteria	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	26	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.6	3,632	-1	$422	$949	$260	1.6
Kitchen	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	711	0	$83	$262	$40	2.7
Kitchen office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
Kitchen bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
Media center	54	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	54	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	1.6	9,598	-2	$1,116	$3,322	$715	2.3
Media center	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,848	0.0	271	0	$32	$130	$24	3.4
Media center	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
AV room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.1	838	0	$97	$219	$60	1.6
MC office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
Elevator machine room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
C127 Mail room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	889	0	$103	$453	$85	3.6
Boys 1st floor W side	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	711	0	$83	$416	$75	4.1
Boys 1st floor W side	1	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	26	3,848	2, 3	Relamp	Yes	1	LED Lamps: 4-pin 1 lamp	Occupancy Sensor	18	2,655	0.0	57	0	$7	$17	$1	2.5
Girls 1st floor W side	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	711	0	$83	$416	$75	4.1
Girls 1st floor W side	1	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	26	3,848	2, 3	Relamp	Yes	1	LED Lamps: 4-pin 1 lamp	Occupancy Sensor	18	2,655	0.0	57	0	$7	$17	$1	2.5
Custodial closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR W101	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	3,199	-1	$372	$927	$215	1.9
W101 prep room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
W101 storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.1	115	0	$13	$189	$20	12.7
CR W103	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.6	3,732	-1	$434	$1,037	$245	1.8
W100 closet	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.1	229	0	$27	$262	$40	8.3
W100 data room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	355	0	$41	$189	$20	4.1
CR W102	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
CR W104	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
CR W105	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.6	3,732	-1	$434	$1,037	$245	1.8
W105 prep room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
W105 closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.1	115	0	$13	$189	$20	12.7
CR W107	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	3,199	-1	$372	$927	$215	1.9
CR W106	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
CR W108	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
CR W109	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
CR W110	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,666	-1	$310	$818	$185	2.0
Electrical room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
Stairwell 2	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.2	978	0	$114	$256	$70	1.6
Stairwell 2	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
W side 1st floor hallway	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.6	3,377	-1	$393	$1,369	$190	3.0
W side 1st floor hallway	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main entrance	2	Compact Fluorescent: 4 pin - dome fixture - 4 lamps	Wall Switch	S	104	3,848	2	Relamp	No	2	LED Lamps: 4 pin - dome fixture - 4 lamps	Wall Switch	73	3,848	0.0	264	0	$31	$138	$8	4.2
Main entrance	4	Compact Fluorescent: 4 pin - cane fixture - 1 lamp	Wall Switch	S	26	3,848	2	Relamp	No	4	LED Lamps: 4 pin - cane fixture - 1 lamp	Wall Switch	18	3,848	0.0	132	0	$15	$69	$4	4.2
Main lobby	1	Compact Fluorescent: Circular fixture	Wall Switch	S	50	3,848	2	Relamp	No	1	LED Lamps: Circular fixture	Wall Switch	35	3,848	0.0	63	0	$7	$17	$1	2.2
Main lobby	1	Compact Fluorescent: 4 pin - dome fixture - 4 lamps	Wall Switch	S	104	3,848	2	Relamp	No	1	LED Lamps: 4-pin - dome fixture - 4 lamps	Wall Switch	73	3,848	0.0	132	0	$15	$69	$4	4.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Main lobby	8	Compact Fluorescent: 4 pin - cane fixture - 1 lamp	Wall Switch	S	26	3,848	2	Relamp	No	8	LED Lamps: 4 pin - cane fixture - 1 lamp	Wall Switch	18	3,848	0.0	264	0	$31	$138	$8	4.2
Main lobby	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.1	559	0	$65	$146	$40	1.6
Main office	8	Compact Fluorescent: 4 pin - cane fixture - 1 lamp	Wall Switch	S	26	3,848	2	Relamp	No	8	LED Lamps: 4 pin - cane fixture - 1 lamp	Wall Switch	18	3,848	0.0	264	0	$31	$138	$8	4.2
Main office	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Copy room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.1	800	0	$93	$280	$65	2.3
PA room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,848	0.0	210	0	$24	$55	$15	1.6
Principal office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.1	800	0	$93	$280	$65	2.3
AP office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.1	533	0	$62	$226	$50	2.8
AP office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.1	533	0	$62	$226	$50	2.8
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
Pantry	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,848	0.0	210	0	$24	$55	$15	1.6
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	355	0	$41	$189	$20	4.1
File room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.1	533	0	$62	$226	$50	2.8
Conference room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.2	1,066	0	$124	$489	$95	3.2
Conference room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.1	533	0	$62	$380	$65	5.1
Main office hall	5	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	26	3,848	2, 4	Relamp	Yes	5	LED Lamps: 4 pin - 1 lamp	High/Low Control	18	2,655	0.0	284	0	$33	$311	$5	9.3
Main office hall	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Hall by copy room	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,655	0.4	2,133	0	$248	$663	$120	2.2
Hall by copy room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Center stairwell	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.2	978	0	$114	$256	$70	1.6
Center stairwell	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
C125	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
Student services	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
C125 office 1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
C123 office 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
C125 office 3	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	711	0	$83	$262	$60	2.4
Nurse closet	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,240	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,240	0.0	44	0	$5	$65	$12	10.4
Nurse's office	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,244	0	$145	$526	$105	2.9
Nurse's office	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,848	0.0	68	0	$8	$33	$6	3.4
Nurse's check up space	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Nurse's check up space	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,655	0.0	270	0	$31	$98	$18	2.5
Nurse's restroom	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,848		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	0	0	$0	$0	$0	0.0
C Hall first floor	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.3	1,600	0	$186	$554	$90	2.5
C Hall first floor	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
123 computer lab	16	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,848	2, 3	Relamp	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,655	0.9	5,010	-1	$583	$1,438	$355	1.9
Custodian closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,240	0.0	45	0	$5	$37	$10	5.1
Electrical panel room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
CR N121	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N122	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N119	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N120	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N117	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N118	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N115	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR N113	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
N116 Mech	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
CR N114	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
CR N112	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.3	1,955	0	$227	$672	$145	2.3
CR N111	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
1st floor crossover	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.1	698	0	$81	$183	$50	1.6
1st floor crossover	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
North stairwell	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.2	978	0	$114	$256	$70	1.6
North stairwell	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
E hall 1st floor	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.2	1,244	0	$145	$481	$70	2.8
E hall 1st floor	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Girls 1st floor E side	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Girls 1st floor E side	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2, 3	Relamp	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,655	0.0	90	0	$10	$33	$6	2.5
Boys 1st floor E side	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	711	0	$83	$416	$75	4.1
E145 Comp lab	16	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,848	2, 3	Relamp	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,655	0.9	5,010	-1	$583	$1,438	$355	1.9
E146 Comp lab	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.5	2,844	-1	$331	$854	$195	2.0
Comp storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	856	0.1	115	0	$13	$189	$40	11.2
E146 Electrical room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
E147 Music room	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,488	-1	$289	$781	$175	2.1
E147 office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
E147 Sound room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	355	0	$41	$189	$20	4.1
Hall by Music room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.2	1,066	0	$124	$444	$60	3.1
Hall by Music room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Hall by pane room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.3	1,600	0	$186	$554	$90	2.5
Hall by pane room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
E152 storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.2	1,333	0	$155	$390	$75	2.0
E151 office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.1	533	0	$62	$226	$30	3.2
CR E150	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR E149	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR E149	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR E148	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,655	0.4	2,133	0	$248	$708	$155	2.2
Restrooms	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
E restroom hall	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,655	0.3	1,600	0	$186	$554	$90	2.5
E restroom hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Hall G 1st floor	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.4	2,133	0	$248	$888	$120	3.1
Hall G 1st floor	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Boys 1st floor G hall	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,848	2, 4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,655	0.1	800	0	$93	$389	$45	3.7
Custodian closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,240	0.0	45	0	$5	$37	$10	5.1
Lighting room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
G154 Band room	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	1.1	6,398	-1	$744	$2,125	$465	2.2
G154 Band room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Weight room	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.7	4,266	-1	$496	$1,416	$310	2.2
Weight room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Weight room office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
Hall by kitchen	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.3	1,600	0	$186	$554	$90	2.5
Hall by kitchen	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Girls 1st floor café	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Hall by Auxillary Gym	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.2	1,422	0	$165	$517	$80	2.6
Hall by Auxillary Gym	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Boys 1st floor M side	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Boys 1st floor M side	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2, 3	Relamp	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,655	0.0	90	0	$10	$33	$6	2.5
Girls 1st floor M side	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$380	$65	5.1
Girls 1st floor M side	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2, 3	Relamp	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,655	0.0	90	0	$10	$33	$6	2.5
CR M132	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,422	0	$165	$562	$115	2.7
CR M130	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,422	0	$165	$562	$115	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
M128 Police	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
M hall 1st floor	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.2	1,244	0	$145	$481	$70	2.8
M hall 1st floor	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Custodian closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,240	0.0	90	0	$10	$73	$20	5.1
Electrical closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,240	0.0	90	0	$10	$73	$20	5.1
CR S134	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S135	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S136	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S137	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.6	3,555	-1	$413	$1,270	$270	2.4
Chemical room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
CR S138	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
S139 Mech room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.3	1,676	0	$195	$438	$120	1.6
CR S140	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
S139 Mech room	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,848	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,848	0.0	74	0	$9	$18	$5	1.5
S142 Teachers lounge	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.1	533	0	$62	$226	$50	2.8
S142 restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	140	0	$16	$37	$10	1.6
S142	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,848	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,848	0.0	68	0	$8	$33	$6	3.4
CR S141	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.2	1,066	0	$124	$489	$95	3.2
CR S143	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
CR S144	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,655	0.4	2,133	0	$248	$708	$155	2.2
S Hall 1st floor	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2, 4	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,655	0.3	1,955	0	$227	$852	$110	3.3
S Hall 1st floor	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
South stairwell	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.2	978	0	$114	$256	$70	1.6
South stairwell	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stage	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.5	3,073	-1	$357	$803	$220	1.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Stage	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stage Upstairs	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
Stage Upstairs	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,848	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,848	0.0	279	0	$32	$73	$20	1.6
Parking lot	24	High-Pressure Sodium: (1) 70W Lamp	Timeclock		95	4,380	1	Fixture Replacement	No	24	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	29	4,380	0.8	6,990	0	$829	$23,183	$2,400	25.1
Door front	11	Compact Fluorescent: Door wall mount - 4 pin - 2 lamps	Photocell		52	4,380	2	Relamp	No	11	LED Lamps: Door wall mount - 4 pin - 2 lamps	Photocell	36	4,380	0.1	752	0	$89	$379	$22	4.0
Canopy	4	Compact Fluorescent: Front door - 4 pin - 1 lamp	Photocell		26	4,380	2	Relamp	No	4	LED Lamps: Front door - 4 pin - 1 lamp	Photocell	18	4,380	0.0	137	0	$16	$69	$4	4.0
Wall mount	13	High-Pressure Sodium: (1) 70W Lamp	Timeclock		95	4,380	1	Fixture Replacement	No	13	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	29	4,380	0.4	3,787	0	$449	$12,558	$1,300	25.1
Wall pack	1	Metal Halide: (1) 70W Lamp	Photocell		95	4,380	1	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	29	4,380	0.0	291	0	$35	$966	$100	25.1
Door canopy	5	High-Pressure Sodium: (1) 70W Lamp	Timeclock		95	4,380	1	Fixture Replacement	No	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	29	4,380	0.2	1,456	0	$173	$4,830	$500	25.1
Auditorium	54	Halogen Incandescent: Minican - 1 lamp	Daylight Dimming	S	200	2,309	2	Relamp	No	54	LED Lamps: Minican - 1 lamp	Daylight Dimming	30	2,309	6.6	23,314	-5	$2,711	$1,900	$54	0.7
Auditorium	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Auditorium	18	Halogen Incandescent: Spot light - 1 lamp	Daylight Dimming	S	750	2,309	2	Relamp	No	18	LED Lamps: Spot light - 1 lamp	Daylight Dimming	113	2,309	8.3	29,143	-6	$3,389	$544	$18	0.2
Auditorium closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,240	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,240	0.0	90	0	$10	$73	$20	5.1

Motor Inventory & Recommendations

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	RTU-2	1	Supply Fan	20.0	93.0%	Yes	W	1,040		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-2	2	Exhaust Fan	3.0	89.5%	Yes	W	1,040		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-1	1	Supply Fan	20.0	93.0%	Yes	W	1,040		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-1	2	Exhaust Fan	3.0	89.5%	Yes	W	1,040		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-6	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-1	1	Exhaust Fan	0.5	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF	6	Exhaust Fan	0.5	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-1	1	Exhaust Fan	0.8	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-2A	1	Exhaust Fan	0.5	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF	3	Exhaust Fan	0.5	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-3B	1	Exhaust Fan	1.0	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERV-5A	1	Supply Fan	7.5	91.7%	No	W	2,745		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERV-5A	1	Exhaust Fan	3.0	89.5%	No	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERV-2	1	Supply Fan	2.0	86.5%	No	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERV-2	1	Exhaust Fan	1.0	85.5%	No	W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HP-1 Cafeteria	1	Supply Fan	7.5	91.7%	No	W	3,391	5	No	91.7%	Yes	1	2.1	7,759	0	$920	$4,738	$600	4.5
Roof	HP-2 Cafeteria	1	Supply Fan	7.5	91.7%	No	W	3,391	5	No	91.7%	Yes	1	2.1	7,759	0	$920	$4,738	$600	4.5
Roof	ERV-5B	1	Supply Fan	7.5	91.7%	No	W	2,745	5	No	91.7%	Yes	1	2.1	6,281	0	$744	$4,738	$600	5.6
Roof	ERV-5B	1	Exhaust Fan	3.0	89.5%	No	W	2,745	5	No	89.5%	Yes	1	0.9	2,574	0	$305	$3,884	$240	11.9

		Existing Conditions								Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	RTU-4 Home Economics	1	Supply Fan	3.0	89.5%	No	W	1,040	5	No	89.5%	Yes	1	0.9	975	0	$116	$3,884	$240	31.5
Roof	RTU-4 Home Economics	1	Exhaust Fan	2.0	86.5%	No	W	1,040	5	No	86.5%	Yes	1	0.6	673	0	$80	$3,261	$160	38.9
Roof	EF-2B	1	Exhaust Fan	0.8	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-5 Gym	1	Supply Fan	5.0	89.5%	No	W	1,040		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-5 Gym	1	Exhaust Fan	5.0	89.5%	No	W	1,040		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-6 Gym	1	Supply Fan	5.0	89.5%	No	W	1,040		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-6 Gym	1	Exhaust Fan	5.0	89.5%	No	W	1,040		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERV-4	1	Supply Fan	7.5	91.7%	No	W	2,745	5	No	91.7%	Yes	1	2.1	6,281	0	$744	$4,738	$600	5.6
Roof	ERV-4	1	Exhaust Fan	3.0	89.5%	No	W	2,745	5	No	89.5%	Yes	1	0.9	2,574	0	$305	$3,884	$240	11.9
Teachers lounge	UV Teachers lounge	2	Supply Fan	0.1	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-3 Lobby	1	Supply Fan	2.0	86.5%	No	W	1,040		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU-3 Lobby	1	Exhaust Fan	1.0	82.5%	No	W	1,040		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERV-3	1	Supply Fan	0.5	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERV-3	1	Exhaust Fan	0.5	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage	AH- 2A, 2B	2	Supply Fan	5.0	89.5%	No	W	2,745	5	No	89.5%	Yes	2	2.9	8,580	0	$1,017	$8,152	$800	7.2
Classrooms	Classrooms	2	Supply Fan	0.2	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage	Geothermal heat pump	1	Heating Hot Water Pump	7.5	91.7%	No	W	0		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Storage	DHW Circulation	1	Water Supply Pump	0.0	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler room	Boiler	2	Heating Hot Water Pump	5.0	89.5%	No	W	400		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Classrooms	Uvs	22	Supply Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	**Motor Quantity**	**Motor Application**	**HP Per Motor**	**Full Load Efficiency**	**VFD Control?**	**Remaining Useful Life**	**Annual Operating Hours**	**ECM #**	**Install High Efficiency Motors?**	**Full Load Efficiency**	**Install VFDs?**	**Number of VFDs**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Total Installation Cost**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
Boiler room	Geothermal waterpump	2	Water-Source Heat Pump Circulation Pump	75.0	95.0%	No	W	4,000	6	No	95.0%	Yes	2	35.1	176,684	0	$20,942	$46,795	$0	2.2
Pump room	DHW recirculation	1	Water Supply Pump	0.0	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Elevator machine	Hydraulic pump	1	Process Pump	15.0	93.0%	No	W	3,391		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage	DHW recirculation	1	Water Supply Pump	0.1	30.0%	No	W	2,745		No	30.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage	Geothermal heat pump	2	Heating Hot Water Pump	5.0	89.0%	No	W	400		No	89.0%	No		0.0	0	0	$0	$0	$0	0.0
Auditorium	AH - 1A, 1B	2	Supply Fan	5.0	89.5%	No	W	2,745	5	No	89.5%	Yes	2	2.9	8,580	0	$1,017	$8,152	$800	7.2
Auditorium	AHU	1	Supply Fan	1.0	82.0%	No	W	2,745		No	82.0%	No		0.0	0	0	$0	$0	$0	0.0
Auditorium	HP3	1	Supply Fan	1.0	82.0%	No	W	2,745		No	82.0%	No		0.0	0	0	$0	$0	$0	0.0
Unknown	AH 1D	1	Supply Fan	5.0	89.5%	No	W	2,745	5	No	89.5%	Yes	1	1.4	4,290	0	$508	$4,076	$400	7.2
Auditorium	Library unit	1	Supply Fan	1.0	89.5%	No	B	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust fans	5	Exhaust Fan	0.3	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust fans	1	Exhaust Fan	0.5	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Electrical rooms	1	Exhaust Fan	0.1	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Storage room	1	Exhaust Fan	0.1	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Toilet room	1	Exhaust Fan	0.1	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Toilet room, Janitors closet	1	Exhaust Fan	0.1	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Teacher's toilet room	1	Exhaust Fan	0.2	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Unknown	2	Supply Fan	0.1	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Unknown	2	Supply Fan	0.3	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Unknown	5	Supply Fan	0.5	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Various spaces	Various spaces	19	Supply Fan	0.3	60.0%	No	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	CU-2/AC-2	1	Split-System AC	1.00		B	7	Yes	1	Split-System AC	1.00		14.00		0.1	118	0	$14	$1,496	$92	100.1
Roof	RTU-2 Classrooms	1	Packaged AC	40.00		B	7	Yes	1	Packaged AC	40.00		9.50		1.4	2,751	0	$326	$88,639	$0	271.9
Roof	RTU-1 Classrooms	1	Packaged AC	40.00		B	7	Yes	1	Packaged AC	40.00		9.50		1.4	2,751	0	$326	$88,639	$0	271.9
Roof	CU-4/AC-4	1	Split-System AC	1.00		B	7	Yes	1	Split-System AC	1.00		14.00		0.1	118	0	$14	$1,496	$92	100.1
Roof	CU-1/AC-1	1	Split-System AC	1.00		B	7	Yes	1	Split-System AC	1.00		14.00		0.1	118	0	$14	$1,496	$92	100.1
Roof	BLR Coach Office	1	Split-System AC	1.00		B	7	Yes	1	Split-System AC	1.00		14.00		0.1	118	0	$14	$1,496	$92	100.1
Heat pump room	Unit heater	1	Electric Resistance Heat		10.23	B		No							0.0	0	0	$0	$0	$0	0.0
Heat pump room	Unit heater	1	Electric Resistance Heat		10.23	B		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU-4 Home Ec	1	Packaged AC	15.00		B	7	Yes	1	Packaged AC	15.00		11.50		1.9	3,629	0	$430	$20,908	$1,185	45.9
Roof	RTU-5 Gym	1	Packaged AC	18.00		B	7	Yes	1	Packaged AC	18.00		11.50		2.6	5,113	0	$606	$25,089	$1,422	39.1
Roof	RTU-6 Gym	1	Packaged AC	18.00		B	7	Yes	1	Packaged AC	18.00		11.50		2.6	4,800	0	$569	$25,089	$1,422	41.6
Roof	RTU-3 Lobby	1	Packaged AC	10.00		B	7	Yes	1	Packaged AC	10.00		11.50		1.4	2,667	0	$316	$17,821	$730	54.1
Roof	CU-3/AC-3	1	Split-System AC	1.00		B	7	Yes	1	Split-System AC	1.00		14.00		0.1	118	0	$14	$1,496	$92	100.1
Storage	Unit heater	2	Electric Resistance Heat		10.23	B		No							0.0	0	0	$0	$0	$0	0.0
GLR Coach office	GLR Coach office	1	Split-System AC	1.00		B	7	Yes	1	Split-System AC	1.00		14.00		0.1	118	0	$14	$1,496	$92	100.1
Auditorium	Library unit	1	Electric Resistance Heat		102.30	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	1	Water Source HP	0.83	18.20	B		No							0.0	0	0	$0	$0	$0	0.0
Unknown	Unknown	5	Water Source HP	3.00	40.00	B		No							0.0	0	0	$0	$0	$0	0.0
Unknown	Unknown	2	Water Source HP	2.00	30.00	B		No							0.0	0	0	$0	$0	$0	0.0
Unknown	Unknown	1	Split-System AC	0.75		B		No							0.0	0	0	$0	$0	$0	0.0

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classroom	Classroom	1	Water Source HP	3.00	44.40	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	1	Water Source HP	1.50	11.80	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	1	Water Source HP	2.00	18.20	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	1	Water Source HP	2.50	21.20	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	1	Water Source HP	3.00	24.50	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	1	Water Source HP	3.50	29.20	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	1	Water Source HP	4.00	36.50	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	1	Water Source HP	4.50	38.80	B		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Classrooms	2	Water Source HP	10.00	94.30	B	8	Yes	1	Water Source HP	10.00	94.30	14.00	4.50	6.1	17,363	0	$2,058	$12,356	$810	5.6
Classrooms	Classrooms	1	Water Source HP	1.00	6.70	B	8	Yes	1	Water Source HP	1.00	6.70	14.00	4.80	0.3	829	0	$98	$2,780	$81	27.5
Classrooms	Classrooms	1	Water Source HP	1.25	10.00	B	8	Yes	1	Water Source HP	1.25	10.00	14.00	4.80	1.0	2,161	0	$256	$3,475	$101	13.2
Classrooms	Classrooms	1	Water Source HP	1.50	10.60	B	8	Yes	1	Water Source HP	1.50	10.60	14.00	4.80	0.8	1,696	0	$201	$4,169	$122	20.1
Classrooms	Classrooms	1	Water Source HP	0.83	7.90	B		No							0.0	0	0	$0	$0	$0	0.0

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	RTU-2 Classrooms	1	Furnace	437.00	B	9	Yes	1	Furnace	437.00	95.00%	AFUE	0.0	0	24	$255	$9,901	$400	37.3
Roof	RTU-1 Classrooms	1	Furnace	437.00	B	9	Yes	1	Furnace	437.00	95.00%	AFUE	0.0	0	24	$255	$9,901	$400	37.3
Roof	RTU-4 Home Ec	1	Furnace	219.00	B	9	Yes	1	Furnace	219.00	95.00%	AFUE	0.0	0	12	$128	$4,962	$400	35.7
Roof	RTU-5 Gym	1	Furnace	219.00	B	9	Yes	1	Furnace	219.00	95.00%	AFUE	0.0	0	12	$128	$4,962	$400	35.7
Roof	RTU-6 Gym	1	Furnace	219.00	B	9	Yes	1	Furnace	219.00	95.00%	AFUE	0.0	0	12	$128	$4,962	$400	35.7
Roof	RTU-3 Lobby	1	Furnace	146.00	B	9	Yes	1	Furnace	146.00	95.00%	AFUE	0.0	0	8	$85	$3,308	$400	34.1
Boiler room	B-1,2	2	Condensing Hot Water Boiler	1,020.00	W		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	**System Quantity**	**System Type**	**Remaining Useful Life**	**ECM #**	**Replace?**	**System Quantity**	**System Type**	**Fuel Type**	**System Efficiency**	**Efficiency Units**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Total Installation Cost**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
2nd floor New section	Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	B		No						0.0	0	0	$0	$0	$0	0.0
Pump room	1st floor restrooms - old section	2	Storage Tank Water Heater (> 50 Gal)	B	10	Yes	2	Storage Tank Water Heater (> 50 Gal)	Natural Gas	80.00%	Et	0.0	0	8	$84	$42,092	$1,470	482.4
1st floor New section	Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	B		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	**ECM #**	**Device Quantity**	**Device Type**	**Existing Flow Rate (gpm)**	**Proposed Flow Rate (gpm)**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Total Installation Cost**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
Kitchen	11	20	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	38	$406	$143	$0	0.4

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
Location	**Cooler/ Freezer Quantity**	**Case Type/Temperature**	**ECM #**	**Install EC Evaporator Fan Motors?**	**Install Electric Defrost Control?**	**Install Evaporator Fan Control?**	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Total Installation Cost**	**Total Incentives**	**Simple Payback w/ Incentives in Years**
Kitchen	1	Cooler (35F to 55F)	12	Yes	No	No	0.0	412	0	$49	$303	$0	6.2
Kitchen	1	Medium Temp Freezer (0F to 30F)	12, 13	Yes	Yes	No	0.1	2,058	0	$244	$1,125	$50	4.4

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Freezer Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Ice Making Head (<450 lbs/day), Batch	Yes		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Insulated Food Holding Cabinet (1/2 Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Full Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Full Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Steamer	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Insulated Food Holding Cabinet (1/2 Size)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

Location	Existing Conditions			
	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Russel OB Middle School	2	Pretzel machine	250.0	Yes
Russel OB Middle School	303	Desktop Computer	145.0	Yes
Russel OB Middle School	25	Laptop	75.0	Yes
Russel OB Middle School	60	Printer - Small	60.0	Yes
Russel OB Middle School	11	Printer - Medium	80.0	Yes
Russel OB Middle School	9	Printer - large	200.0	Yes
Russel OB Middle School	3	Paper Shredder	150.0	Yes
Russel OB Middle School	61	Projector	300.0	Yes
Russel OB Middle School	17	Microwave	900.0	Yes
Russel OB Middle School	7	Refrigerator - Small	60.0	Yes
Russel OB Middle School	5	Refrigerator - Medium	80.0	Yes
Russel OB Middle School	8	Refrigerator - Large	220.0	Yes
Russel OB Middle School	7	Coffee Machine	400.0	Yes
Russel OB Middle School	1	Toaster	900.0	Yes
Russel OB Middle School	8	Toaster Oven	1,200.0	Yes
Russel OB Middle School	1	Clothes Washer	900.0	Yes
Russel OB Middle School	1	Clothes dryer	1,500.0	Yes
Russel OB Middle School	4	Dishwasher	900.0	Yes
Russel OB Middle School	1	Television - CRT	130.0	Yes
Russel OB Middle School	1	Television - Plasma	120.0	Yes
Russel OB Middle School	1	Television - LED	100.0	Yes
Russel OB Middle School	1	Electric stove	1,500.0	Yes
Russel OB Middle School	5	Fume hood	100.0	Yes
Russel OB Middle School	40	Smart boards	5.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Various spaces	4	Refrigerated	14	Yes	0.7	6,447	0	$764	$920	$200	0.9

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

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ENERGY STAR® Statement of Energy Performance

48

ENERGY STAR® Score[1]

Russell O Brackman Middle School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 172,970
Built: 1990

For Year Ending: January 31, 2019
Date Generated: July 30, 2019

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Russell O Brackman Middle School 600 Barnegat Blvd North Barnegat, New Jersey 08005	Barnegat Township School District 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 (____)____-______	Stephen Brennan 550 BARENGAT BLVD. NORTH Barnegat, NJ 08005 609-698-5800 SBRENNAN@BARNEGATSCHOOLS.COI

Property ID: 7071504

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
45.9 kBtu/ft²

Source EUI
111.3 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	6,237,551 (79%)
Natural Gas (kBtu)	1,700,377 (21%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	45.1
National Median Source EUI (kBtu/ft²)	109.5
% Diff from National Median Source EUI	2%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	722

Signature & Stamp of Verifying Professional

I _________________ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: ______________________Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer Stamp
(if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gas* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.
gpf	*Gallons per flush*

gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp.
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units.
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp.
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp.
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge.
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense™	The symbol for water efficiency. The WaterSense™ program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.

Appendix B: LGEA ECM Comparison

The ECMs identified in the LGEAs are tabulated below. Each table identifies whether the ECM has been included in the ESP. For the measures where “No” is selected, there is an explanation below the table is provided of why it was not included.

Table 1: Collins LGEA ECMs

ECM No.	ECM Description	In ESP (Y/N)
ECM-1	Retrofit Fixtures with LED Lamps	N*
ECM-2	Install Occupancy Sensor Lighting Controls	N*
ECM-3	Install High/Low Lighting Controls	N*
ECM-4	Install VFDs on Constant Volume (CV) Fans	N*
ECM-5	Install High Efficiency Air Conditioning Units	N*
ECM-6	Install High Efficiency Gas-Fired Water Heater	N*
ECM-7	Install Low-Flow DHW Devices	Y*

*ECM-1, 2, & 3: A lighting upgrade to LED was already completed in Collins prior to the IGA. The school maintenance staff replaced fluorescent fixtures with LED.
*ECM-4: CHA reached out to the unit manufacturer and the existing units are not able to properly modulate cooling capacity to be compatible with variable fan speed / variable airflow.
*ECM-5: This was not included due to poor payback.
*ECM-6: This was not included due to poor payback.

Table 2: High School LGEA ECMs

ECM No.	ECM Description	In ESP (Y/N)
ECM-1	Install LED Fixtures	Y
ECM-2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Y
ECM-3	Retrofit Fixtures with LED Lamps	Y
ECM-4	Install Occupancy Sensor Lighting Controls	N*
ECM-5	Premium Efficiency Motors	N*
ECM-6	Install VFDs on Constant Volume (CV) Fans	Y
ECM-7	Install VFDs on Chilled Water Pumps	N*
ECM-8	Install High Efficiency Air Conditioning Units	N*
ECM-9	Install High Efficiency PTAC/PTHP	N*
ECM-10	Install High Efficiency Chillers	Y
ECM-11	Install High Efficiency Furnaces	N*
ECM-12	Install High Efficiency Unit Heaters	N*
ECM-13	Install Low-Flow DHW Devices	Y
ECM-14	Vending Machine Control	Y

*ECM-4: Occupancy sensors were not recommended because they were already found throughout the school.
*ECM-5: Premium efficiency motors were not included due to poor payback.
*ECM-7: Chilled water pumps are already on VFDs.
*ECM-8: AHU replacement is not included due to poor payback. VFD upgrades on AHU fans where appropriate are proposed instead.
*ECM-9: This was not included due to poor payback.
*ECM-11: This was not included due to poor payback.
*ECM-12: This was not included due to poor payback.

Table 3: Horbelt LGEA ECMs

ECM No.	ECM Description	In ESP (Y/N)
ECM-1	Install LED Fixtures	Y
ECM-2	Retrofit Fixtures with LED Lamps	Y
ECM-3	Install Occupancy Sensor Lighting Controls	Y
ECM-4	Install High/Low Lighting Controls	N*
ECM-5	Install VFDs on Constant Volume (CV) Fans	N*
ECM-6	Install High Efficiency Heat Pumps	Y
ECM-7	Install High Efficiency Hot Water Boilers	N*
ECM-8	Vending Machine Control	Y

*ECM-4: High/Low controls were not included; only occupancy sensors were considered for the lighting upgrade.
*ECM-5: This measure is not included due to poor payback.
*ECM-7: This measure is not included due to feedback from facility staff and poor payback.

Table 4: Donahue LGEA ECMs

ECM No.	ECM Description	In ESP (Y/N)
ECM-1	Install LED Fixtures	Y
ECM-2	Retrofit Fixtures with LED Lamps	Y
ECM-3	Install Occupancy Sensor Lighting Controls	Y
ECM-4	Install VFDs on Constant Volume (CV) Fans	N*
ECM-5	Install High Efficiency Gas-Fired Water Heater	Y
ECM-6	Install Low-Flow DHW Devices	Y
ECM-7	Vending Machine Control	Y

*ECM-4: This was not include due to poor payback.

Table 5: Dunfee LGEA ECMs

ECM No.	ECM Description	In ESP (Y/N)
ECM-1	Retrofit Fixtures with LED Lamps	Y
ECM-2	Install Occupancy Sensor Lighting Controls	Y
ECM-3	Install High/Low Lighting Controls	N*
ECM-4	Install VFDs on Constant Volume (CV) Fans	Y
ECM-5	Install VFDs on Heating Water Pumps	N*
ECM-6	Install High Efficiency Air Conditioning Units	N*
ECM-7	Install High Efficiency Furnaces	N*
ECM-8	Install High Efficiency Gas-Fired Water Heater	Y
ECM-9	Install Low-Flow DHW Devices	Y
ECM-10	Vending Machine Control	Y

*ECM-3: High/Low controls were not considered as occupancy sensors were recommended instead.
*ECM-5: This was not included due to poor payback.
*ECM-6: This was not included due to poor payback.
*ECM-7: This was not included due to poor payback.
*ECM-10: This was not included due to poor payback.

Table 6: Brackman LGEA ECMs

ECM No.	ECM Description	In ESP (Y/N)
ECM-1	Install LED Fixtures	Y
ECM-2	Retrofit Fixtures with LED Lamps	Y
ECM-3	Install Occupancy Sensor Lighting Controls	Y
ECM-4	Install High/Low Lighting Controls	N*
ECM-5	Install VFDs on Constant Volume (CV) Fans	Y
ECM-6	Install VFDs on Heating Water Pumps	Y
ECM-7	Install High Efficiency Air Conditioning Units	N*
ECM-8	Install High Efficiency Heat Pumps	Y*
ECM-9	Install High Efficiency Furnaces	N*
ECM-10	Install High Efficiency Gas-Fired Water Heater	Y
ECM-11	Install Low-Flow DHW Devices	Y
ECM-12	Refrigerator/Freezer Case Electrically Commutated Motors	Y
ECM-13	Refrigeration Controls	Y
ECM-14	Vending Machine Control	Y

*ECM-4: High/Low controls were not included; only occupancy sensors were considered for the lighting upgrade.
*ECM-7: This measure is not included due to poor payback. Included supply fan VFDs and demand control ventilation (DCV) instead.
*ECM-8: This measure is included as an alternate.
*ECM-9: Rooftop unit replacement would not have an economical payback.

Appendix C: Utility Analysis

Barnegat Schools Utility Summary

UTILITY COSTS & CONSUMPTION												
	Existing Solar PPA		Exist. JCP&L Utility		Total Electric Data		Natural Gas Data		Water/Sewer Data		Total Utility Cost w/ PPA ($)	Total Utility Cost w/out PPA
	Consumption (kWh)	Cost ($)	Consumption (kWh)	Cost ($)	Consumption (kWh)	Cost ($)	Consumption (Therms)	Cost ($)	Usage (kGal)	Cost ($)		
Barnegat Township High School	**454,417**	**$ 57,211**	**2,214,489**	**$ 252,824**	2,668,905	$ 310,035	40,643	$43,924	2,786	$16,526	$370,484	$ 313,273
Russell O. Brackman Middle School	**462,149**	**$ 58,185**	**1,336,622**	**$ 156,762**	1,798,771	$214,947	16,296	$17,487	610	$4,198	$236,632	$178,447
Joseph T. Donahue Elementary School	**239,023**	**$ 30,093**	**581,852**	**$ 67,975**	820,874	$98,068	12,963	$14,566	556	$3,360	$115,994	$85,901
Lillian M. Dunfee Elementary School	**224,121**	**$ 28,217**	**370,944**	**$ 47,724**	595,065	$75,941	16,994	$17,628	421	$2,162	$95,730	$67,513
Cecil S. Collins Elementary School and Board Offices	**350,556**	**$ 44,135**	**368,235**	**$ 52,708**	718,791	$96,843	23,667	$24,937	590	$3,934	$125,713	$81,578
Robert L. Horbelt Elementary School	**45,812**	**$ 5,768**	**693,299**	**$ 80,035**	739,111	$85,803	12,637	$14,175	334	$1,954	$101,931	$96,163
Totals	**1,776,079**	**$ 223,608**	**5,565,440**	**$ 658,027**	**7,341,518**	**$881,636**	**123,200**	**$132,715**	**5,297**	**$32,133**	**$1,046,484**	**$822,875**

High School

Summary A/C: 200000053963

Font is red are estimated.
(Bills were not available)

Electrical Use

Delivery: JCP&L

Supply: East Coast Power & Gas of NJ; Plymouth Rock Energy

Account #: **100087783716**

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	On Peak Demand (kW)	Energy Use (kWh)	Blended Rate $/kWh	Consumption Rate $/kWh	Demand Rate $/kW	Delivery kWh Cost	Supplier kWh Cost	Total Consumption Cost ($)	Demand Cost ($)	Total Cost
Feb	2019	02/21/19	03/22/19	30	Win	414.7	142,994	$ 0.112	$ 0.094	$ 6.119	$ 2,314	$ 11,169	$ 13,484	$ 2,537	$ 16,021
Mar	2019	03/23/19	04/22/19	31	Win	397.4	122,169	$ 0.115	$ 0.095	$ 6.112	$ 2,073	$ 9,543	$ 11,616	$ 2,429	$ 14,045
Apr	2019	04/23/19	05/22/19	30	Win	509.8	145,481	$ 0.119	$ 0.097	$ 6.121	$ 2,772	$ 11,364	$ 14,136	$ 3,120	$ 17,256
May	2019	05/23/19	06/20/19	29	Spr	607.7	189,962	$ 0.115	$ 0.094	$ 6.521	$ 3,066	$ 14,837	$ 17,903	$ 3,963	$ 21,866
Jul	2019	06/21/19	07/22/19	32	Spr	545.8	224,196	$ 0.114	$ 0.098	$ 6.509	$ 4,466	$ 17,510	$ 21,977	$ 3,552	$ 25,529
Jul	2019	07/23/19	08/21/19	30	Spr	701.3	269,922	$ 0.115	$ 0.098	$ 6.535	$ 5,361	$ 21,081	$ 26,442	$ 4,583	$ 31,025
Aug	2019	08/22/19	09/20/19	30	Sum	613.4	252,815	$ 0.114	$ 0.098	$ 6.522	$ 5,026	$ 19,745	$ 24,771	$ 4,001	$ 28,772
Oct	2019	09/21/19	10/23/19	33	Sum	633.6	236,481	$ 0.114	$ 0.098	$ 6.073	$ 4,702	$ 18,470	$ 23,171	$ 3,848	$ 27,019
Oct	2019	10/24/19	11/21/19	29	Sum	517.0	157,874	$ 0.118	$ 0.098	$ 6.051	$ 3,188	$ 12,331	$ 15,519	$ 3,128	$ 18,647
Nov	2019	11/22/19	12/20/19	29	Fall	419.0	154,275	$ 0.112	$ 0.096	$ 6.023	$ 2,776	$ 12,050	$ 14,826	$ 2,524	$ 17,350
Jan	2020	12/21/19	01/21/20	32	Fall	419.0	160,788	$ 0.110	$ 0.095	$ 6.023	$ 2,661	$ 12,559	$ 15,220	$ 2,524	$ 17,743
Feb	2020	01/22/20	02/22/20	32	Fall	419.0	157,532	$ 0.111	$ 0.095	$ 6.023	$ 2,718	$ 12,305	$ 15,023	$ 2,524	$ 17,550
TOTAL	**Last 12 Months**			**367**		**701.3**	**2,214,489**	**$ 0.114**	**$ 0.097**	**$ 6.219**	**$ 41,123**	**$ 172,965**	**$ 214,088**	**$ 38,732**	**$ 252,824**

High School

Font is red are estimated.
(Bills were not available)

Natural Gas
Delivery: New Jersey Natural Gas
Supply: UGI Energy Services LLC

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	Energy Use, CCF	Energy Use, Therms	Energy Cost $/Therm	Delivery Charge	Supply Charge	Total Cost
						Account #:	**22-0009-2074-20**				
Mar	2019	03/07/19	04/05/19	29	Spring	5,808	6,922	$ 0.91	$ 3,483.20	$ 2,826.35	$ 6,309.55
May	2019	04/05/19	05/08/19	33	Spring	1,160	1,385	$ 1.25	$ 1,186.85	$ 543.65	$ 1,730.50
May	2019	05/08/19	06/07/19	30	Summer	460	548	$ 1.90	$ 835.76	$ 206.47	$ 1,042.23
Jul	2019	06/07/19	07/09/19	32	Summer	379	450	$ 2.15	$ 794.74	$ 172.81	$ 967.55
Jul	2019	07/09/19	08/05/19	27	Summer	281	333	$ 2.58	$ 745.72	$ 115.61	$ 861.33
Aug	2019	08/05/19	09/03/19	29	Fall	311	370	$ 2.39	$ 761.09	$ 122.48	$ 883.57
Sep	2019	09/03/19	10/01/19	28	Fall	386	459	$ 2.81	$ 1,130.92	$ 157.13	$ 1,288.05
Nov	2019	10/01/19	11/01/19	31	Fall	870	1,036	$ 1.72	$ 1,412.41	$ 375.20	$ 1,787.61
Dec	2019	11/01/19	12/05/19	34	Winter	6,054	7,219	$ 1.00	$ 4,504.44	$ 2,744.98	$ 7,249.42
Jan	2020	12/05/19	01/07/20	33	Winter	6,669	7,915	$ 0.99	$ 4,930.08	$ 2,900.55	$ 7,830.63
Jan	2020	01/07/20	01/31/20	24	Winter	5,255	6,262	$ 1.00	$ 3,912.32	$ 2,328.80	$ 6,241.12
Mar	2020	02/01/20	03/04/20	32	Winter	6,515	7,744	$ 1.00	$ 4,852.18	$ 2,879.83	$ 7,732.01
TOTAL	**st 12 Months**			**362**			40,644	$ 1.08	$ 28,549.71	$ 15,373.86	$ 43,923.57

High School

****Barnegat ISD gets quarterly bills for their water usage. Charges for their water are shown from their water bills in the photo below.**

Font is red are
estimated.
(Bills were not

Water/Sewer Use

					Account 785071-5						
Month	**Year ('##)**	**Period Start Date**	**Period End Date**	**Days**	**Season**	**Consumption (kGal)**	**Water Rate ($/kGal)**	**Sewer Rate ($/kGal)**	**Water Cost**	**Sewer Cost**	**Total Cost**
Dec	2018	10/01/18	12/31/18	92		420	$ 5.939		$ 2,495	$ 6,420	$ 8,915
Mar	2019	01/01/19	03/31/19	90		285	$ 5.949		$ 1,695	$ 6,420	$ 8,115
Jun	2019	04/01/19	06/30/19	91		652	$ 5.933		$ 3,868	$ 6,420	$ 10,288
Sep	2019	07/01/19	09/30/19	92		989	$ 5.928		$ 5,863	$ 6,420	$ 12,283
Dec	2019	10/01/19	12/31/19	92		860	$ 5.929		$ 5,099	$ 6,420	$ 11,519
TOTAL	**Last 12 Months**			**365**		**2,786**	**$ 5.932**		**16,526**	**25,680**	**42,206**

Middle School

Summary A/C: 200000053963

Font is red are estimated.
(Bills were not available)

Electrical Use

Delivery: JCP&L

Supply: East Coast Power & Gas of NJ

Account #: **100019012598**

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	On Peak Demand (kW)	Energy Use (kWh)	Blended Rate $/kWh	Consumption Rate $/kWh	Demand Rate $/kW	Delivery kWh Cost	Supplier kWh Cost	Total Consumption Cost ($)	Demand Cost ($)	Total Cost
Feb	2019	01/26/19	02/26/19	32	Win	452.4	157,358	$ 0.112	$ 0.094	$ 6.131	$ 2,523	$ 12,288	$ 14,811	$ 2,774	$ 17,585
Mar	2019	02/27/19	03/27/19	29	Win	373.5	113,958	$ 0.114	$ 0.094	$ 6.102	$ 3,844	$ 6,899	$ 10,743	$ 2,279	$ 13,023
Apr	2019	03/28/19	04/25/19	29	Spr	347.6	78,666	$ 0.123	$ 0.096	$ 6.090	$ 1,385	$ 6,143	$ 7,528	$ 2,117	$ 9,645
May	2019	04/26/19	05/28/19	33	Spr	351.4	99,890	$ 0.118	$ 0.096	$ 6.050	$ 1,829	$ 7,800	$ 9,630	$ 2,126	$ 11,756
Jun	2019	05/29/19	06/26/19	29	Sum	363.4	94,506	$ 0.120	$ 0.096	$ 6.448	$ 1,647	$ 7,380	$ 9,027	$ 2,343	$ 11,370
Jul	2019	06/27/19	07/26/19	30	Sum	307.6	100,336	$ 0.118	$ 0.098	$ 6.414	$ 2,028	$ 7,835	$ 9,863	$ 1,973	$ 11,836
Aug	2019	07/27/19	08/27/19	32	Fall	314.8	124,086	$ 0.114	$ 0.098	$ 6.419	$ 2,613	$ 9,570	$ 12,183	$ 2,021	$ 14,203
Sep	2019	08/28/19	09/25/19	29	Fall	431.1	96,874	$ 0.127	$ 0.098	$ 6.476	$ 1,960	$ 7,565	$ 9,525	$ 2,792	$ 12,317
Oct	2019	09/26/19	10/28/19	33	Fall	364.3	100,280	$ 0.120	$ 0.098	$ 6.001	$ 2,022	$ 7,831	$ 9,853	$ 2,186	$ 12,039
Nov	2019	10/29/19	11/25/19	28	Win	380.7	109,039	$ 0.119	$ 0.098	$ 6.008	$ 2,214	$ 8,515	$ 10,729	$ 2,287	$ 13,016
Dec	2019	11/26/19	12/26/19	31	Win	403.2	125,361	$ 0.117	$ 0.096	$ 6.182	$ 2,446	$ 9,784	$ 12,230	$ 2,493	$ 14,723
Jan	2019	12/27/19	01/24/20	29	Win	425.7	141,682	$ 0.113	$ 0.094	$ 6.025	$ 2,334	$ 11,054	$ 13,388	$ 2,565	$ 15,952
Feb	2020	01/25/20	02/25/20	32	Win	422.5	151,944	$ 0.111	$ 0.094	$ 6.024	$ 2,471	$ 11,865	$ 14,337	$ 2,545	$ 16,882
TOTAL	**Last 12 Months**			**364**		**431.1**	**1,336,622**	**$ 0.117**	**$ 0.097**	**$ 6.187**	**$ 26,794**	**$ 102,242**	**$ 129,035**	**$ 27,727**	**$ 156,762**

Middle School

Font is red are estimated.
(Bills were not available)

Natural Gas
Delivery: New Jersey Natural Gas
Supply: UGI Energy Services LLC

Account #: 07-5080-0190-29

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	Energy Use, CCF	Energy Use, Therms	Energy Cost $/Therm	Delivery Charge	Supply Charge	Total Cost
Mar	2019	03/04/19	04/01/19	28	Spring	2,339	2,788	$ 0.93	$ 1,450.29	$ 1,138.47	$ 2,588.76
May	2019	04/01/19	05/03/19	32	Spring	1,509	1,801	$ 0.98	$ 1,050.02	$ 707.67	$ 1,757.69
Jun	2019	05/03/19	06/05/19	33	Summer	472	562	$ 1.32	$ 530.14	$ 211.64	$ 741.78
Jun	2019	06/05/19	07/03/19	28	Summer	125	148	$ 2.79	$ 356.55	$ 57.23	$ 413.78
Jul	2019	07/03/19	08/02/19	30	Summer	103	122	$ 3.18	$ 345.52	$ 42.50	$ 388.02
Aug	2019	08/02/19	08/30/19	28	Fall	106	126	$ 3.09	$ 347.16	$ 41.80	$ 388.96
Aug	2019	08/30/19	09/26/19	27	Fall	141	168	$ 2.52	$ 364.68	$ 57.42	$ 422.10
Sep	2019	09/26/19	11/01/19	36	Fall	534	636	$ 1.37	$ 641.33	$ 230.16	$ 871.49
Nov	2019	11/01/19	11/27/19	26	Winter	1,228	1,464	$ 1.07	$ 1,015.13	$ 556.74	$ 1,571.87
Nov	2019	11/27/19	01/03/20	37	Winter	2,710	3,216	$ 0.98	$ 1,968.87	$ 1,178.25	$ 3,147.12
Jan	2020	01/03/20	01/30/20	27	Winter	2,157	2,571	$ 0.99	$ 1,590.57	$ 955.94	$ 2,546.51
Jan	2020	01/30/20	03/02/20	32	Winter	2,266	2,694	$ 0.98	$ 1,646.85	$ 1,001.86	$ 2,648.71
TOTAL	**st 12 Months**			**364**			16,296	$ 1.07	$ 11,307.11	$ 6,179.68	$ 17,486.79

Middle School

****Barnegat ISD gets quarterly bills for their water usage. Charges for their water are shown from their water bills in the photo below.**

Font is red are
estimated.
(Bills were not

Water/Sewer Use

					785071-6					
Month	**Year ('##)**	**Period Start Date**	**Period End Date**	**Days**	**Consumption (kGal)**	**Water Rate ($/kGal)**	**Sewer Rate ($/kGal)**	**Water Cost**	**Sewer Cost**	**Total Cost**
Dec	2018	10/01/18	12/31/18	92	232	$ 6.48		$ 1,502	$ 3,745	$ 5,247
Mar	2019	01/01/19	03/31/19	90	180	$ 6.64		$ 1,195	$ 3,745	$ 4,940
Jun	2019	04/01/19	06/30/19	91	200	$ 6.56		$ 1,313	$ 3,745	$ 5,058
Sep	2019	07/01/19	09/30/19	92	52	$ 9.77		$ 508	$ 3,745	$ 4,253
Dec	2019	10/01/19	12/31/19	92	178	$ 6.64		$ 1,183	$ 3,745	$ 4,928
TOTAL	**Last 12 Months**			**365**	**610**	**$ 6.88**		**$ 4,198**	**$ 14,980**	**$ 19,178**

Collins

Summary A/C: 200000053963

Font is red are estimated.
(Bills were not available)

Electrical Use

Delivery: JCP&L

Supply: East Coast Power & Gas of NJ

Account #: **100019012465**

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	On Peak Demand (kW)	Energy Use (kWh)	Blended Rate $/kWh	Consumption Rate $/kWh	Demand Rate $/kW	Delivery kWh Cost	Supplier kWh Cost	Total Consumption Cost ($)	Demand Cost ($)	Total Cost
Feb	2019	01/26/19	02/26/19	32	Win	102.6	37,134	$ 0.128	$ 0.113	$ 5.659	$ 643	$ 3,541	$ 4,184	$ 581	$ 4,765
Mar	2019	02/27/19	03/27/19	29	Win	96.1	28,142	$ 0.139	$ 0.119	$ 5.618	$ 502	$ 2,858	$ 3,360	$ 540	$ 3,900
Apr	2019	03/28/19	04/25/19	29	Spr	105.3	21,634	$ 0.149	$ 0.121	$ 5.675	$ 426	$ 2,200	$ 2,626	$ 598	$ 3,224
May	2019	04/26/19	05/28/19	33	Spr	133.4	21,921	$ 0.157	$ 0.122	$ 5.761	$ 452	$ 2,226	$ 2,678	$ 768	$ 3,446
Jun	2019	05/29/19	06/26/19	29	Sum	125.3	24,931	$ 0.143	$ 0.112	$ 6.101	$ 483	$ 2,322	$ 2,804	$ 764	$ 3,569
Jul	2019	06/27/19	07/26/19	30	Sum	136.6	27,975	$ 0.155	$ 0.125	$ 6.145	$ 613	$ 2,881	$ 3,494	$ 839	$ 4,334
Aug	2019	07/27/19	08/27/19	32	Fall	127.4	28,853	$ 0.148	$ 0.121	$ 6.110	$ 630	$ 2,859	$ 3,489	$ 778	$ 4,268
Sep	2019	08/28/19	09/25/19	29	Fall	135.0	26,280	$ 0.153	$ 0.121	$ 6.139	$ 580	$ 2,604	$ 3,184	$ 829	$ 4,013
Oct	2019	09/26/19	10/28/19	33	Fall	136.1	31,419	$ 0.145	$ 0.121	$ 5.717	$ 676	$ 3,114	$ 3,789	$ 778	$ 4,567
Nov	2019	10/29/19	11/26/19	29	Win	112.3	35,781	$ 0.138	$ 0.121	$ 5.621	$ 768	$ 3,546	$ 4,314	$ 631	$ 4,945
Dec	2019	11/27/19	12/26/19	30	Win	115.6	38,052	$ 0.143	$ 0.119	$ 5.817	$ 1,009	$ 3,771	$ 4,780	$ 672	$ 5,452
Jan	2019	12/27/19	01/24/20	29	Win	118.8	40,323	$ 0.133	$ 0.117	$ 5.651	$ 705	$ 3,996	$ 4,701	$ 671	$ 5,373
Feb	2020	01/25/20	02/25/20	32	Win	110.7	42,924	$ 0.131	$ 0.116	$ 5.613	$ 742	$ 4,254	$ 4,996	$ 621	$ 5,617
TOTAL	**Last 12 Months**			**364**		**136.6**	**368,235**	**$ 0.143**	**$ 0.120**	**$ 5.830**	**$ 7,585**	**$ 36,632**	**$ 44,217**	**$ 8,491**	**$ 52,708**

Collins

Font is red are estimated.
(Bills were not available)

Natural Gas
Delivery: New Jersey Natural Gas
Supply: UGI Energy Services LLC

Account #: **22-0006-1134-44**

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	Energy Use, CCF	Energy Use, Therms	Energy Cost $/Therm	Delivery Charge	Supply Charge	Total Cost
Mar	2019	03/04/19	04/01/19	28	Spring	3,619	4,313	$ 0.91	$ 2,160.76	$ 1,761.13	$ 3,921.89
May	2019	04/01/19	05/03/19	32	Spring	1,305	1,558	$ 1.05	$ 1,025.70	$ 611.80	$ 1,637.50
Jun	2019	05/03/19	06/05/19	33	Summer	236	281	$ 2.12	$ 490.05	$ 106.01	$ 596.06
Jun	2019	06/05/19	07/03/19	28	Summer	90	107	$ 4.29	$ 416.96	$ 41.04	$ 458.00
Jul	2019	07/03/19	08/02/19	30	Summer	60	71	$ 6.00	$ 401.97	$ 24.82	$ 426.79
Aug	2019	08/02/19	08/30/19	28	Fall	65	77	$ 5.56	$ 404.55	$ 25.60	$ 430.15
Aug	2019	08/30/19	09/26/19	27	Fall	171	203	$ 2.75	$ 489.91	$ 69.84	$ 559.75
Sep	2019	09/26/19	11/01/19	36	Fall	656	781	$ 1.44	$ 838.92	$ 282.99	$ 1,121.91
Nov	2019	11/01/19	11/27/19	26	Winter	2,476	2,953	$ 1.00	$ 1,824.51	$ 1,122.80	$ 2,947.31
Nov	2019	11/27/19	01/03/20	37	Winter	4,384	5,203	$ 0.95	$ 3,061.29	$ 1,906.53	$ 4,967.82
Jan	2020	01/03/20	01/30/20	27	Winter	3,290	3,921	$ 0.97	$ 2,361.30	$ 1,458.14	$ 3,819.44
Jan	2020	01/30/20	03/02/20	32	Winter	3,532	4,198	$ 0.96	$ 2,488.31	$ 1,561.64	$ 4,049.95
TOTAL	**Last 12 Months**			**364**			23,667	$ 1.05	$ 15,964.23	$ 8,972.34	$ 24,936.57

Collins

Barnegat ISD gets quarterly bills for their water usage. Charges for their water are shown from their water bills in the photo below.

Font is red are estimated. (Bills were not

Water/Sewer Use

						Account 785071-3						
Month	**Year ('##)**	**Period Start Date**	**Period End Date**	**Days**	**Season**	**Consumption (kGal)**	**Water Rate ($/kGal)**	**Sewer Rate ($/kGal)**	**Water Cost**	**Sewer Cost**	**Total Cost**	
Dec	2018	10/01/18	12/31/18	92		148	6.5190		$ 965	$ 3,317	$ 4,282	
Mar	2019	01/01/19	03/31/19	90		186	6.3966		$ 1,190	$ 3,317	$ 4,507	
Jun	2019	04/01/19	06/30/19	91		190	6.3866		$ 1,213	$ 3,317	$ 4,530	
Sep	2019	07/01/19	09/30/19	92		46	9.7215		$ 447	$ 3,317	$ 3,764	
Dec	2019	10/01/19	12/31/19	92		168	6.4477		$ 1,083	$ 3,317	$ 4,400	
TOTAL	**Last 12 Months**			**365**		**590**	**6.6672**		**3,934**	**13,268**	**17,202**	

Dunfee

Summary A/C: 200000053963

Font is red are estimated.
(Bills were not available)

Electrical Use

Delivery: JCP&L

Supply: East Coast Power & Gas of NJ

Account #: **100019381894**

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	On Peak Demand (kW)	Energy Use (kWh)	Blended Rate $/kWh	Consumption Rate $/kWh	Demand Rate $/kW	Delivery kWh Cost	Supplier kWh Cost	Total Consumption Cost ($)	Demand Cost ($)	Total Cost
Feb	2019	01/26/19	02/26/19	32	Win	182.2	50,846	$ 0.116	$ 0.095	$ 5.926	$ 857	$ 3,971	$ 4,828	$ 1,080	$ 5,908
Mar	2019	02/27/19	03/27/19	29	Win	176.4	35,159	$ 0.125	$ 0.095	$ 5.915	$ 611	$ 2,747	$ 3,358	$ 1,043	$ 4,401
Apr	2019	03/28/19	04/25/19	29	Spr	157.7	24,607	$ 0.135	$ 0.097	$ 5.872	$ 476	$ 1,922	$ 2,398	$ 926	$ 3,324
May	2019	04/26/19	05/28/19	33	Spr	149.4	25,304	$ 0.133	$ 0.098	$ 5.809	$ 510	$ 1,976	$ 2,486	$ 868	$ 3,354
Jun	2019	05/29/19	06/26/19	29	Sum	150.5	25,749	$ 0.134	$ 0.097	$ 6.190	$ 496	$ 2,011	$ 2,507	$ 932	$ 3,438
Jul	2019	06/27/19	07/26/19	30	Sum	128.5	23,056	$ 0.135	$ 0.101	$ 6.114	$ 517	$ 1,801	$ 2,318	$ 786	$ 3,104
Aug	2019	07/27/19	08/27/19	32	Fall	123.8	26,440	$ 0.129	$ 0.100	$ 6.094	$ 583	$ 2,065	$ 2,648	$ 754	$ 3,402
Sep	2019	08/28/19	09/25/19	29	Fall	156.2	25,781	$ 0.138	$ 0.100	$ 6.206	$ 570	$ 2,013	$ 2,583	$ 969	$ 3,552
Oct	2019	09/26/19	10/28/19	33	Fall	148.7	32,823	$ 0.126	$ 0.100	$ 5.755	$ 703	$ 2,563	$ 3,266	$ 856	$ 4,122
Nov	2019	10/29/19	11/25/19	28	Win	175.0	31,565	$ 0.132	$ 0.100	$ 5.817	$ 684	$ 2,465	$ 3,149	$ 1,018	$ 4,167
Dec	2019	11/26/19	12/26/19	31	Win	183.9	35,128	$ 0.129	$ 0.098	$ 5.948	$ 683	$ 2,743	$ 3,426	$ 1,094	$ 4,520
Jan	2019	12/27/19	01/24/20	29	Win	192.8	38,691	$ 0.125	$ 0.096	$ 5.844	$ 679	$ 3,021	$ 3,700	$ 1,127	$ 4,827
Feb	2020	01/25/20	02/25/20	32	Win	183.2	46,641	$ 0.118	$ 0.095	$ 5.833	$ 801	$ 3,642	$ 4,443	$ 1,069	$ 5,512
TOTAL	**Last 12 Months**			**364**		**192.8**	**370,944**	**$ 0.129**	**$ 0.098**	**$ 5.950**	**$ 7,314**	**$ 28,969**	**$ 36,283**	**$ 11,441**	**$ 47,724**

Dunfee

Font in red are estimated.
(Bills were not available)

Natural Gas
Delivery: New Jersey Natural Gas
Supply: UGI Energy Services LLC

						Account #:	**22-0008-6868-52**				
Month	**Year ('##)**	**Period Start Date**	**Period End Date**	**Days**	**Season**	**Energy Use, CCF**	**Energy Use, Therms**	**Energy Cost $/Therm**	**Delivery Charge**	**Supply Charge**	**Total Cost**
Mar	2019	03/06/19	04/03/19	28	Spring	2,258	2,691	$ 0.93	$ 1,392.78	$ 1,098.85	$ 2,491.63
May	2019	04/03/19	05/07/19	34	Spring	1,257	1,500	$ 1.00	$ 905.02	$ 589.47	$ 1,494.49
May	2019	05/07/19	06/04/19	28	Summer	474	565	$ 1.28	$ 512.35	$ 212.75	$ 725.10
Jul	2019	06/04/19	07/08/19	34	Summer	240	285	$ 1.77	$ 395.07	$ 109.18	$ 504.25
Jul	2019	07/08/19	08/05/19	28	Summer	180	213	$ 2.06	$ 365.05	$ 74.13	$ 439.18
Aug	2019	08/05/19	08/29/19	24	Fall	97	115	$ 2.66	$ 268.79	$ 38.24	$ 307.03
Aug	2019	08/29/19	09/27/19	29	Fall	39	46	$ 6.63	$ 291.06	$ 16.12	$ 307.18
Sep	2019	09/27/19	11/01/19	35	Fall	537	640	$ 1.25	$ 565.08	$ 231.58	$ 796.66
Dec	2019	11/01/19	12/02/19	31	Winter	2,155	2,570	$ 0.97	$ 1,516.38	$ 977.10	$ 2,493.48
Jan	2020	12/02/19	01/06/20	35	Winter	2,786	3,318	$ 0.96	$ 1,913.85	$ 1,276.29	$ 3,190.14
Jan	2020	01/06/20	01/31/20	25	Winter	2,030	2,419	$ 0.96	$ 1,412.98	$ 899.81	$ 2,312.79
Jan	2020	01/31/20	03/02/20	31	Winter	2,214	2,632	$ 0.97	$ 1,586.93	$ 978.89	$ 2,565.82
TOTAL	**st 12 Months**			**362**			16,994	$ 1.04	$ 11,125.34	$ 6,502.41	$ 17,627.75

Dunfee

****Barnegat ISD gets quarterly bills for their water usage. Charges for their water are shown from their water bills in the photo below.**

Font is red are estimated. (Bills were not

Water/Sewer Use

					Account	**785071-1**					
Month	**Year ('##)**	**Period Start Date**	**Period End Date**	**Days**	**Season**	**Consumption (kGal)**	**Water Rate ($/kGal)**	**Sewer Rate ($/kGal)**	**Water Cost**	**Sewer Cost**	**Total Cost**
Dec	2018	10/01/18	12/31/18	92		128	$ 5.05		$ 647	$ 1,926	$ 2,573
Mar	2019	01/01/19	03/31/19	90		114	$ 4.95		$ 564	$ 1,926	$ 2,490
Jun	2019	04/01/19	06/30/19	91		129	$ 5.06		$ 653	$ 1,926	$ 2,579
Sep	2019	07/01/19	09/30/19	92		37	$ 5.97		$ 221	$ 1,926	$ 2,147
Dec	2019	10/01/19	12/31/19	92		141	$ 5.13		$ 724	$ 1,926	$ 2,650
TOTAL	**Last 12 Months**			**365**		**421**	**$ 5.13**		**2,162**	**7,704**	**9,866**

Donahue

Summary A/C: 200000053963

Font is red are estimated.
(Bills were not available)

Electrical Use

Delivery: JCP&L

Supply: East Coast Power & Gas of NJ

Account #: **100076367430**

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	On Peak Demand (kW)	Energy Use (kWh)	Blended Rate $/kWh	Consumption Rate $/kWh	Demand Rate $/kW	Delivery kWh Cost	Supplier kWh Cost	Total Consumption Cost ($)	Demand Cost ($)	Total Cost
Feb	2019	01/26/19	02/25/19	31	Win	246.7	83,900	$ 0.112	$ 0.094	$ 6.016	$ 1,274	$ 6,652	$ 7,926	$ 1,484	$ 9,410
Mar	2019	02/26/19	03/26/19	29	Win	201.3	56,834	$ 0.116	$ 0.095	$ 5.959	$ 951	$ 4,438	$ 5,389	$ 1,199	$ 6,589
Apr	2019	03/27/19	04/25/19	30	Spr	170.6	27,146	$ 0.134	$ 0.097	$ 5.902	$ 518	$ 2,120	$ 2,637	$ 1,007	$ 3,644
May	2019	04/26/19	05/28/19	33	Spr	144.4	32,888	$ 0.123	$ 0.098	$ 5.796	$ 644	$ 2,568	$ 3,212	$ 837	$ 4,049
Jun	2019	05/29/19	06/26/19	29	Sum	132.5	38,361	$ 0.118	$ 0.097	$ 6.130	$ 707	$ 2,996	$ 3,703	$ 812	$ 4,515
Jul	2019	06/27/19	07/26/19	30	Sum	148.9	43,920	$ 0.120	$ 0.099	$ 6.185	$ 925	$ 3,430	$ 4,354	$ 921	$ 5,275
Aug	2019	07/27/19	08/27/19	32	Fall	156.8	53,007	$ 0.117	$ 0.099	$ 6.207	$ 1,102	$ 4,139	$ 5,242	$ 973	$ 6,215
Sep	2019	08/28/19	09/25/19	29	Fall	151.5	45,119	$ 0.120	$ 0.099	$ 6.192	$ 948	$ 3,523	$ 4,472	$ 938	$ 5,410
Oct	2019	09/26/19	10/28/19	33	Fall	161.7	43,093	$ 0.121	$ 0.099	$ 5.788	$ 904	$ 3,365	$ 4,269	$ 936	$ 5,205
Nov	2019	10/29/19	11/26/19	29	Win	163.4	53,572	$ 0.118	$ 0.097	$ 5.924	$ 1,194	$ 4,183	$ 5,378	$ 968	$ 6,345
Dec	2019	11/27/19	12/25/19	29	Win	165.0	64,050	$ 0.111	$ 0.098	$ 5.190	$ 1,245	$ 5,002	$ 6,246	$ 856	$ 7,103
Jan	2019	12/26/19	01/24/20	30	Win	164.3	60,425	$ 0.111	$ 0.095	$ 5.794	$ 1,026	$ 4,719	$ 5,745	$ 952	$ 6,697
Feb	2020	01/25/20	02/25/20	32	Win	157.0	63,437	$ 0.109	$ 0.095	$ 5.777	$ 1,067	$ 4,954	$ 6,021	$ 907	$ 6,928
TOTAL	**Last 12 Months**			**365**		**201.3**	**581,852**	**$ 0.117**	**$ 0.097**	**$ 5.904**	**$ 11,232**	**$ 45,437**	**$ 56,668**	**$ 11,307**	**$ 67,975**

Donahue

Font is red are estimated.
(Bills were not available)

Natural Gas

Delivery: New Jersey Natural Gas

Supply: UGI Energy Services LLC

Avg

Account #: **22-0011-9247-19**

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	Energy Use, CCF	Energy Use, Therms	Energy Cost $/Therm	Delivery Charge	Supply Charge	Total Cost
Mar	2019	03/07/19	04/05/19	29	Spring	1,698	2,024	$ 0.94	$ 1,081.36	$ 826.33	$ 1,907.69
May	2019	04/05/19	05/08/19	33	Spring	424	506	$ 1.29	$ 452.51	$ 199.06	$ 651.57
May	2019	05/08/19	06/07/19	30	Summer	261	311	$ 1.57	$ 370.59	$ 117.46	$ 488.05
Jul	2019	06/07/19	07/09/19	32	Summer	226	268	$ 1.70	$ 352.78	$ 103.16	$ 455.94
Jul	2019	07/09/19	08/05/19	27	Summer	200	237	$ 1.78	$ 339.69	$ 82.28	$ 421.97
Aug	2019	08/05/19	09/03/19	29	Fall	95	113	$ 2.88	$ 287.57	$ 37.59	$ 325.16
Sep	2019	09/03/19	10/01/19	28	Fall	173	206	$ 2.41	$ 424.60	$ 70.51	$ 495.11
Nov	2019	10/01/19	11/01/19	31	Fall	180	214	$ 2.41	$ 438.29	$ 77.67	$ 515.96
Dec	2019	11/01/19	12/05/19	34	Winter	1,655	1,974	$ 1.06	$ 1,339.04	$ 750.52	$ 2,089.56
Jan	2020	12/05/19	01/07/20	33	Winter	2,260	2,682	$ 1.00	$ 1,702.79	$ 982.53	$ 2,685.32
Jan	2020	01/07/20	01/31/20	24	Winter	1,720	2,050	$ 1.02	$ 1,318.33	$ 762.42	$ 2,080.75
Jan	2020	01/31/20	03/04/20	33	Winter	2,001	2,379	$ 1.03	$ 1,563.99	$ 884.51	$ 2,448.50
TOTAL	**ıst 12 Months**			**363**			12,963	$ 1.12	$ 9,671.54	$ 4,894.04	$ 14,565.58

Donahue

Barnegat ISD gets quarterly bills for their water usage. Charges for their water are shown from their water bills in the photo below.

Font is red are estimated. (Bills were not

Water/Sewer Use

Month	Year ('##)	Period Start Date	Period End Date	Days	Consumption (kGal)	Water Rate ($/kGal)	Sewer Rate ($/kGal)	Water Cost	Sewer Cost	Total Cost
					785071-10					
Dec	2018	10/01/18	12/31/18	92	176	$ 5.97		$ 1,050	$ 2,247	$ 3,297
Mar	2019	01/01/19	03/31/19	90	76	$ 6.50		$ 494	$ 2,247	$ 2,741
Jun	2019	04/01/19	06/30/19	91	121	$ 5.99		$ 724	$ 2,247	$ 2,971
Sep	2019	07/01/19	09/30/19	92	190	$ 5.96		$ 1,133	$ 2,247	$ 3,380
Dec	2019	10/01/19	12/31/19	92	169	$ 5.97		$ 1,009	$ 2,247	$ 3,256
TOTAL	**Last 12 Months**			**365**	**556**	**$ 6.04**		**$ 3,360**	**$ 8,988**	**$ 12,348**

Horbelt

Summary A/C: 200000053963

Font is red are estimated.
(Bills were not available)

Electrical Use

Delivery: JCP&L

Supply: East Coast Power & Gas of NJ

Account #: **100022354391**

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	On Peak Demand (kW)	Energy Use (kWh)	Blended Rate $/kWh	Consumption Rate $/kWh	Demand Rate $/kW	Delivery kWh Cost	Supplier kWh Cost	Total Consumption Cost ($)	Demand Cost ($)	Total Cost
Feb	2019	01/26/19	02/26/19	32	Win	173.4	66,236	$ 0.110	$ 0.095	$ 5.908	$ 1,098	$ 5,172	$ 6,270	$ 1,025	$ 7,295
Feb	2019	02/27/19	03/27/19	29	Win	144.0	54,408	$ 0.110	$ 0.095	$ 5.835	$ 913	$ 4,249	$ 5,162	$ 840	$ 6,002
Mar	2019	03/28/19	04/25/19	29	Win	131.9	43,777	$ 0.114	$ 0.096	$ 5.795	$ 798	$ 3,419	$ 4,217	$ 764	$ 4,981
May	2019	04/26/19	05/28/19	33	Win	200.4	57,442	$ 0.118	$ 0.097	$ 5.917	$ 1,099	$ 4,466	$ 5,564	$ 1,186	$ 6,750
May	2019	05/29/19	06/26/19	29	Spr	214.0	68,530	$ 0.116	$ 0.096	$ 6.320	$ 1,212	$ 5,352	$ 6,563	$ 1,353	$ 7,916
Jun	2019	06/27/19	07/26/19	30	Spr	157.8	67,075	$ 0.113	$ 0.099	$ 6.210	$ 1,378	$ 5,238	$ 6,615	$ 980	$ 7,595
Aug	2019	07/27/19	08/27/19	32	Spr	184.3	64,660	$ 0.118	$ 0.100	$ 6.270	$ 1,430	$ 5,049	$ 6,480	$ 1,156	$ 7,635
Aug	2019	08/28/19	09/25/19	29	Sum	207.9	65,440	$ 0.117	$ 0.097	$ 6.311	$ 1,167	$ 5,186	$ 6,353	$ 1,312	$ 7,666
Oct	2019	09/26/19	10/28/19	33	Sum	195.8	62,872	$ 0.117	$ 0.099	$ 5.855	$ 1,291	$ 4,910	$ 6,200	$ 1,146	$ 7,347
Oct	2019	10/29/19	11/26/19	29	Sum	187.2	48,277	$ 0.122	$ 0.099	$ 5.867	$ 1,009	$ 3,770	$ 4,779	$ 1,098	$ 5,878
Nov	2019	11/27/19	12/26/19	30	Fall	194.6	50,427	$ 0.115	$ 0.097	$ 5.989	$ 698	$ 3,938	$ 4,636	$ 1,165	$ 5,801
Dec	2019	12/27/19	01/24/20	29	Fall	201.9	52,577	$ 0.118	$ 0.095	$ 5.864	$ 901	$ 4,106	$ 5,006	$ 1,184	$ 6,191
Feb	2020	01/25/20	02/25/20	32	Fall	136.5	57,814	$ 0.109	$ 0.095	$ 5.718	$ 978	$ 4,515	$ 5,493	$ 781	$ 6,273
TOTAL	**Last 12 Months**			**364**		**214.0**	**693,299**	**$ 0.115**	**$ 0.097**	**$ 5.996**	**$ 12,874**	**$ 54,196**	**$ 67,070**	**$ 12,965**	**$ 80,035**

Horbelt

Font is red are estimated. (Bills were not

Natural Gas

Delivery: New Jersey Natural Gas

Supply: UGI Energy Services LLC

Account #: 22-0006-7515-18

Month	Year ('##)	Period Start Date	Period End Date	Days	Season	Energy Use, CCF	Energy Use, Therms	Energy Cost $/Therm	Delivery Charge	Supply Charge	Total Cost
Mar	2019	03/05/19	04/03/19	29	Spring	1,798	1,952	$ 0.97	$ 1,093.34	$ 797.13	$ 1,890.47
May	2019	04/03/19	05/07/19	34	Spring	446	485	$ 1.40	$ 486.33	$ 190.58	$ 676.91
May	2019	05/07/19	06/06/19	30	Summer	106	115	$ 3.26	$ 331.10	$ 43.59	$ 374.69
Jul	2019	06/06/19	07/08/19	32	Summer	64	69	$ 4.89	$ 311.90	$ 26.73	$ 338.63
Jul	2019	07/08/19	08/06/19	29	Summer	43	46	$ 6.85	$ 302.34	$ 15.98	$ 318.32
Aug	2019	08/06/19	08/30/19	24	Fall	33	36	$ 7.07	$ 241.28	$ 11.66	$ 252.94
Aug	2019	08/30/19	09/28/19	29	Fall	71	77	$ 4.44	$ 315.14	$ 26.19	$ 341.33
Sep	2019	09/28/19	11/04/19	37	Fall	323	351	$ 1.79	$ 500.42	$ 126.96	$ 627.38
Nov	2019	11/04/19	12/03/19	29	Winter	1,705	1,852	$ 1.03	$ 1,201.72	$ 704.32	$ 1,906.04
Jan	2020	12/03/19	01/06/20	34	Winter	2,637	2,851	$ 0.96	$ 1,702.78	$ 1,044.66	$ 2,747.44
Jan	2020	01/06/20	01/30/20	24	Winter	2,115	2,296	$ 0.97	$ 1,369.25	$ 853.90	$ 2,223.15
Jan	2020	01/30/20	03/02/20	32	Winter	2,315	2,507	$ 0.99	$ 1,545.43	$ 932.24	$ 2,477.67
TOTAL	**st 12 Months**			**363**			12,637	$ 1.12	$ 9,401.03	$ 4,773.94	$ 14,174.97

Horbelt

****Barnegat ISD gets quarterly bills for their water usage. Charges for their water are shown from their water bills in the photo below.**

Font is red are estimated. (Bills were not

Water/Sewer Use

						Account 785071-4					
Month	**Year ('##)**	**Period Start Date**	**Period End Date**	**Days**	**Season**	**Consumption (kGal)**	**Water Rate ($/kGal)**	**Sewer Rate ($/kGal)**	**Water Cost**	**Sewer Cost**	**Total Cost**
Dec	2018	10/01/18	12/31/18	92		88	5.5681		$ 490	$ 1,926	$ 2,416
Mar	2019	01/01/19	03/31/19	90		82	5.6513		$ 463	$ 1,926	$ 2,389
Jun	2019	04/01/19	06/30/19	91		108	5.4677		$ 591	$ 1,926	$ 2,517
Sep	2019	07/01/19	09/30/19	92		26	9.6112		$ 250	$ 1,926	$ 2,176
Dec	2019	10/01/19	12/31/19	92		118	5.5060		$ 650	$ 1,926	$ 2,576
TOTAL	**Last 12 Months**			**365**		**334**	**5.8489**		**1,954**	**7,704**	**9,658**

Appendix D: Financial Analysis

The Board of Education of the Township of Barnegat

In the County of Ocean, New Jersey

2020 Energy Savings Improvement Plan

Projected Energy Savings with Projected Lease Financing - 18 Years (PRELIMINARY)

INCLUDES ALTERNATES #1 & 2 - 18 YEARS

Assumptions - Financing			
Dated & Delivery:	12/1/20	First Principal:	12/1/21
First Interest:	12/1/21	Final Principal:	12/1/38
		Borrowing Rate:	2.60%
Sources of Funds:			
Proceeds of Financing:		$5,677,000	
Total Sources:		$5,677,000	
Uses of Funds:			
Total Project Costs:		$5,616,827	
Financing Costs:		60,000	
Capitalized Interest		0	
Rounding:		173	
Total Uses:		$5,677,000	

Assumptions - Project†	
Project Hard Costs:	$4,891,724
Soft Costs (excl. Financing)	$725,103
Total Project Costs:	$5,616,827
Energy Savings Escalation Rate:	2.279%
Utility Cost Escalation Rate:	2.000%
Operational Savings Escalation Rate:	0.000%

	PROJECTED PROJECT SAVINGS				REBATES^	TOTAL	SCHOOL DISTRICT COSTS					
School FY End 6/30	Projected Energy Savings†	Annual PV Savings†	Annual O&M Savings†	Total Projected Savings	Approved Rebates†	Projected Annual Benefits	**Projected 2020 Lease** Principal	Interest	Total P+I	Perform. Mgmt†*	Total Costs	**NET SAVINGS**
2021												
2022	185,088	149,034	(1,062)	333,060		333,060	110,000	219,973	329,973		329,973	**3,087**
2023	189,306	152,779	(1,062)	341,023	230,556	571,579	429,000	139,165	568,165		568,165	**3,414**
2024	193,620	156,616	(1,562)	348,673	230,556	579,229	448,000	127,764	575,764		575,764	**3,465**
2025	198,032	160,547	(1,562)	357,017		357,017	235,000	118,885	353,885		353,885	**3,132**
2026	202,545	164,575	(1,562)	365,558		365,558	250,000	112,580	362,580		362,580	**2,978**
2027	207,161	168,703	(1,562)	374,302		374,302	265,000	105,885	370,885		370,885	**3,417**
2028	211,882	172,932	(1,562)	383,252		383,252	281,000	98,787	379,787		379,787	**3,465**
2029	216,710	177,265	(1,562)	392,413		392,413	298,000	91,260	389,260		389,260	**3,153**
2030	221,648	181,705	(1,562)	401,790		401,790	315,000	83,291	398,291		398,291	**3,499**
2031	226,699	186,254	(1,562)	411,390		411,390	333,000	74,867	407,867		407,867	**3,523**
2032	231,865	190,914	(1,562)	421,217		421,217	352,000	65,962	417,962		417,962	**3,255**
2033	237,149	195,689	(1,562)	431,276		431,276	371,000	56,563	427,563		427,563	**3,713**
2034	242,553	200,582	(1,562)	441,573		441,573	392,000	46,644	438,644		438,644	**2,929**
2035	248,080	205,595	(1,562)	452,112		452,112	413,000	36,179	449,179		449,179	**2,933**
2036	253,733	210,730	(1,562)	462,901		462,901	434,000	25,168	459,168		459,168	**3,733**
2037	259,515		(1,562)	257,953		257,953	238,000	16,432	254,432		254,432	**3,521**
2038	265,429		(1,562)	263,867		263,867	250,000	10,088	260,088		260,088	**3,779**
2039	271,478		(1,562)	269,916		269,916	263,000	3,419	266,419		266,419	**3,497**
2040	277,664		(1,562)	276,102		276,102			0		0	**276,102**
2041	283,991		(1,562)	282,429		282,429			0		0	**282,429**
Total:	4,624,148	2,673,920	(30,247)	7,267,821	461,112	7,728,933	5,677,000	1,432,912	7,109,912	0	7,109,912	**619,021**

† *Projections from CHA Consulting. Project Costs exclude financing costs. Rebates assumed to be received, in part, in FY2022 and 2023.*

* *Assumed not applicable because DIY ESIP.*

^ *100% of Rebates utilized in debt structuring. Spread over 2 fiscal years to be conservative.*

Appendix E: EPA Portfolio Manager

ENERGY STAR® Data Verification Checklist

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42

ENERGY STAR ® Score[1]

Barnegat High School

Registry Name: Barnegat High School
Property Type: K-12 School
Gross Floor Area (ft^2): 201,214
Built: 2004

For Year Ending: Jan 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Barnegat High School 180 Bengal Boulevard Barnegat, New Jersey 08005 **Property ID**: 10497355	___________________ , (____)____-______	____ ________ , (____)____-______ ___________________

1. Review of Whole Property Characteristics

Basic Property Information

1) **Property Name:** Barnegat High School ☐ **Yes** ☐ **No**

Is this the official name of the property?

If "No", please specify: ____

2) **Property Type:** K-12 School ☐ **Yes** ☐ **No**

Is this an accurate description of the primary use of this property?

3) **Location:** ☐ **Yes** ☐ **No**

180 Bengal Boulevard
Barnegat, New Jersey 08005

Is this correct and complete?

4) **Gross Floor Area:** 201,214 ft^2 ☐ **Yes** ☐ **No**

Is value an accurate account of the gross floor area for the property?

5) Average Occupancy (%): 85 ☐ **Yes** ☐ **No**

Is this occupancy percentage accurate for the entire 12 month period being assessed?

6) Number of Buildings: 1 ☐ **Yes** ☐ **No**

Does this number accurately represent all structures?

7) Whole Property Verification: ☐ **Yes** ☐ **No**

Does this application represent the entire property? If any space or energy use has been excluded from this property, please describe it in the notes section below.

Notes:

Indoor Environmental Quality

1) Outdoor Air Ventilation ☐ **Yes** ☐ **No**

Were measurements and/or calculations taken and recorded under normal building operating conditions using an allowable method as described in the Licensed Professional's Guide which demonstrate this property meets the minimum ventilation rates according to ANSI/ ASHRAE Standard 62?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

2) Thermal Environmental Conditions ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the Licensed Professional's Guide which demonstrate this property meets the acceptable thermal environmental conditions according to ANSI/ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

3) Illumination ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the LP Guide which demonstrate this property meets minimum recommended illumination levels according to the most recent version of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

Notes:

2. Review of Property Use Details

K-12 School: Building Use

This Use Detail is used to calculate the 1-100 ENERGY STAR Score.

1) Gross Floor Area: 201,214 ft² ☐ Yes ☐ No

Is this the total size, as measured between the outside surface of the exterior walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) High School: 100% Yes ☐ Yes ☐ No

Is this is the correct answer to whether the property is a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, then it is a high school. For example, if the school teaches grades K-12 (elementary/middle and high school), then it is considered a high school.

3) Number of Workers on Main Shift: 70 ☐ Yes ☐ No

Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

4) Student Seating Capacity: 937 ☐ Yes ☐ No

Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.

5) Months in Use: 9 ☐ Yes ☐ No

Is this the total number of months that the property is open for standard activities?

6) Weekend Operation: 100% Yes ☐ Yes ☐ No

Is this the correct answer to whether the property includes regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity includes any time when the property is used for classes, performances, or other school or community activities, on one or both days of the weekend during one or more seasons of the year.

7) Number of Computers: 950 ☐ **Yes** ☐ **No**

Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.

★ **8) Cooking Facilities:** 100% Yes ☐ **Yes** ☐ **No**

Is this the correct answer to whether the property has a commercial cooking area designed to provide and serve food to occupants and/or visitors? Commercial kitchens include restaurants and cafeterias, but not employee break room kitchens.

9) Gross Floor Area Used for Food Preparation: 0 ft² ← default ☐ **Yes** ☐ **No**

Is this the correct Gross Floor Area Used for Food Preparation? It is defined as the total size of all large/commercial kitchen areas used for the storage and preparation of food. It is a subset of the property Gross Floor Area. It should not include small kitchens, employee break rooms/pantries, concession stands, or service and seating areas.

10) Number of Walk-in Refrigeration/Freezer Units: 2 ☐ **Yes** ☐ **No**

Is this the total count of walk-in units at the property? The Number of Walk-in Refrigeration/Freezer Units is the total count of walk-in units at the property. Walk-in Refrigeration/Freezers are large enough for a person to actually walk into. They may or may not have a door, plastic strips, or other flexible covers.

★ **11) Percent That Can Be Heated:** 100 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be heated by mechanical equipment?

★ **12) Percent That Can Be Cooled:** 80 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.

13) Gymnasium Floor Area: 0 ft² ← default ☐ **Yes** ☐ **No**

Is this the correct floor area for the gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?

14) School District: Barnegat Twp ☐ **Yes** ☐ **No**

Is this the administrative school district in which the property is located?

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Solar (kBtu)	1,441,189.4 (11%)
Electric - Grid (kBtu)	7,186,304.9 (57%)
Natural Gas (kBtu)	4,065,641 (32%)
Total Energy (kBtu)	12,693,135.2

Energy Intensity

Site (kBtu/ft²)	63.1
Source (kBtu/ft²)	128.4

National Median Comparison

National Median Site EUI (kBtu/ft²)	58.7
National Median Source EUI (kBtu/ft²)	119.5
% Diff from National Median Source EUI	7.4%

Emissions (based on site energy use)

Greenhouse Gas Emissions (Metric Tons CO2e)	944

Power Generation Plant or Distribution Utility:
Atlantic City Electric Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Energy Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values. **Note: please review all meter entries, making note of any unusual entries, and, if they are correct, provide a manual note to explain.**

Meter Name	Fuel Type	Start Date	End Date	Associated With:
Electric Solar Meter	Electric - Solar	02/21/2019	In Use	Barnegat High School; Barnegat Township School District
Electric Grid Meter	Electric - Grid	02/21/2019	In Use	Barnegat High School; Barnegat Township School District
Natural Gas	Natural Gas	01/31/2019	In Use	Barnegat High School; Barnegat Township School District

Total Energy Use ☐ **Yes** ☐ **No**

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels ☐ **Yes** ☐ **No**

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy ☐ **Yes** ☐ **No**

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric - Solar Meter: Electric Solar Meter (kWh (thousand Watt-hours))

Associated With: Barnegat High School; Barnegat Township School District

Start Date	End Date	Energy Used Onsite	Energy Exported Offsite	REC Ownership
02/21/2019	03/22/2019	38,904.7 ← estimate	0	Owned
03/23/2019	04/22/2019	44,723.29 ← estimate	0	Owned
04/23/2019	05/22/2019	50,622.68 ← estimate	0	Owned
05/23/2019	06/20/2019	48,801.94 ← estimate	0	Owned
06/21/2019	07/22/2019	50,765.29 ← estimate	0	Owned
07/23/2019	08/21/2019	45,710.53 ← estimate	0	Owned
08/22/2019	09/20/2019	38,514.15 ← estimate	0	Owned
09/21/2019	10/23/2019	30,650.6 ← estimate	0	Owned
10/24/2019	11/21/2019	23,721.12 ← estimate	0	Owned
11/22/2019	12/20/2019	19,060.1 ← estimate	0	Owned
12/21/2019	01/21/2020	22,095.5 ← estimate	0	Owned
01/22/2020	02/22/2020	28,219.37 ← estimate	0	Owned
		Total Consumption (kWh (thousand Watt-hours)):		441,789.27
		Total Consumption (kBtu (thousand Btu)):		1,507,385

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric - Grid Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Barnegat High School; Barnegat Township School District

Start Date	End Date	Usage	Green Power?
02/21/2019	03/22/2019	142,994	No
03/23/2019	04/22/2019	122,169	No
04/23/2019	05/22/2019	145,481	No
05/23/2019	06/20/2019	189,962	No
06/21/2019	07/22/2019	224,196	No
07/23/2019	08/21/2019	269,922	No
08/22/2019	09/20/2019	252,815	No
09/21/2019	10/23/2019	236,481	No
10/24/2019	11/21/2019	157,874	No
11/22/2019	12/20/2019	154,275	No
12/21/2019	01/21/2020	160,788	No
01/22/2020	02/22/2020	157,531.5 ← estimate	No
		Total Consumption (kWh (thousand Watt-hours)):	2,214,488.5
		Total Consumption (kBtu (thousand Btu)):	7,555,834.8

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: Barnegat High School; Barnegat Township School District

Start Date	End Date	Usage
01/31/2019	03/06/2019	7,744 ← estimate
03/07/2019	04/05/2019	6,922
04/05/2019	05/08/2019	1,385
05/08/2019	06/07/2019	548

Start Date	End Date	Usage
06/07/2019	07/09/2019	450
07/09/2019	08/05/2019	333
08/05/2019	09/03/2019	370
09/03/2019	10/01/2019	459
10/01/2019	11/01/2019	1,036
11/01/2019	12/05/2019	7,219
12/05/2019	01/07/2020	7,915
01/07/2020	01/31/2020	6,262
01/31/2020	03/04/2020	7,744
	Total Consumption (therms):	48,387
	Total Consumption (kBtu (thousand Btu)):	4,838,700

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

___________________ (Name) visited this site on ___________ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature _______________________

Date _________

Licensed Professional

____ ________
,
(____)____-______
____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineering Stamp

(if applicable)

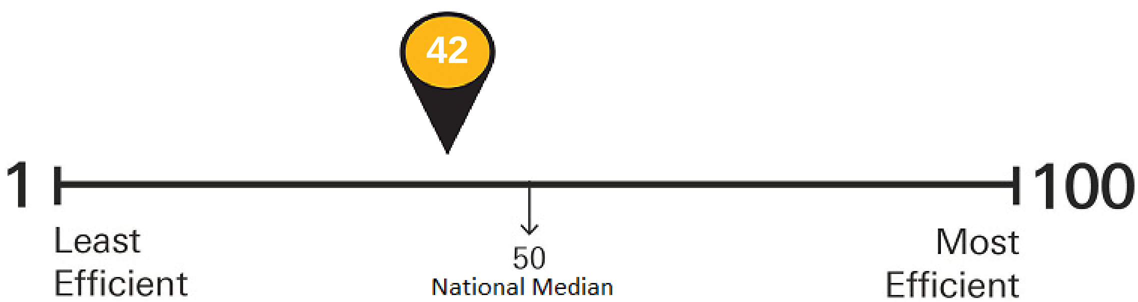
ENERGY STAR® Energy Performance Scorecard

Barnegat High School

42

out of 100

For Year Ending	January 31, 2020
Property Address	180 Bengal Boulevard Barnegat, New Jersey 08005
Primary Function	K-12 School
Gross Floor Area (ft²)	201,214
Year built	2004
Energy Use per sq. ft.*	63.1 kBtu



What is the ENERGY STAR Score?
The ENERGY STAR score rates commercial building's energy performance relative to similar buildings nationwide. Expressed as a number on a simple 1-100 scale, the score rates performance on a percentile basis: a building with a score of 50 performs better than 50% of its peers. Higher scores mean better energy efficiency, resulting in less energy use and fewer greenhouse gas emissions. If a 1-100 score for a specific building type has not been developed, Site Energy Use Intensity (EUI) will be displayed on this scorecard.

Learn more at:
energystar.gov/scorecard

*Site energy use

United States Environmental Protection Agency

Date Generated: May 22, 2020

ENERGY STAR® Statement of Energy Performance

42

ENERGY STAR® Score[1]

Barnegat High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 201,214
Built: 2004

For Year Ending: January 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Barnegat High School 180 Bengal Boulevard Barnegat, New Jersey 08005	_________________ , (____)____-______	____ ________ , (____)____-______ _________________

Property ID: 10497355

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
63.1 kBtu/ft²

Source EUI
128.4 kBtu/ft²

Annual Energy by Fuel

Electric - Solar (kBtu)	1,441,189 (11%)
Electric - Grid (kBtu)	7,186,305 (57%)
Natural Gas (kBtu)	4,065,641 (32%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	58.7
National Median Source EUI (kBtu/ft²)	119.5
% Diff from National Median Source EUI	7%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	944

Signature & Stamp of Verifying Professional

I __________________ (Name) verify that the above information is true and correct to the best of my knowledge.

LP Signature: ________________________Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer or Registered Architect Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

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46

ENERGY STAR ® Score[1]

Russell O. Brackman Middle School

Registry Name: Russell O. Brackman Middle School
Property Type: K-12 School
Gross Floor Area (ft²): 172,970
Built: 1989

For Year Ending: Jan 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Russell O. Brackman Middle School
600 Barnegat Blvd. North
Barnegat, New Jersey 08005

Property ID: 10497358

Property Owner
____
,
(____)____-______

Primary Contact
____ ________
,
(____)____-______
____

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Russell O. Brackman Middle School ☐ **Yes** ☐ **No**

Is this the official name of the property?

If "No", please specify: _____________________________________

2) Property Type: K-12 School ☐ **Yes** ☐ **No**

Is this an accurate description of the primary use of this property?

3) Location: ☐ **Yes** ☐ **No**

600 Barnegat Blvd. North
Barnegat, New Jersey 08005

Is this correct and complete?

4) Gross Floor Area: 172,970 ft² ☐ **Yes** ☐ **No**

Is value an accurate account of the gross floor area for the property?

5) Average Occupancy (%): 85 ☐ **Yes** ☐ **No**

Is this occupancy percentage accurate for the entire 12 month period being assessed?

6) Number of Buildings: 1 ☐ **Yes** ☐ **No**

Does this number accurately represent all structures?

7) Whole Property Verification: ☐ **Yes** ☐ **No**

Does this application represent the entire property? If any space or energy use has been excluded from this property, please describe it in the notes section below.

Notes:

Indoor Environmental Quality

1) Outdoor Air Ventilation ☐ **Yes** ☐ **No**

Were measurements and/or calculations taken and recorded under normal building operating conditions using an allowable method as described in the Licensed Professional's Guide which demonstrate this property meets the minimum ventilation rates according to ANSI/ ASHRAE Standard 62?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

2) Thermal Environmental Conditions ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the Licensed Professional's Guide which demonstrate this property meets the acceptable thermal environmental conditions according to ANSI/ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

3) Illumination ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the LP Guide which demonstrate this property meets minimum recommended illumination levels according to the most recent version of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

Notes:

2. Review of Property Use Details

K-12 School: Building Use

This Use Detail is used to calculate the 1-100 ENERGY STAR Score.

1) Gross Floor Area: 172,970 ft² ☐ Yes ☐ No

Is this the total size, as measured between the outside surface of the exterior walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) High School: No ☐ Yes ☐ No

Is this is the correct answer to whether the property is a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, then it is a high school. For example, if the school teaches grades K-12 (elementary/middle and high school), then it is considered a high school.

3) Number of Workers on Main Shift: 50 ☐ Yes ☐ No

Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

4) Student Seating Capacity: 720 ☐ Yes ☐ No

Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.

5) Months in Use: 9 ☐ Yes ☐ No

Is this the total number of months that the property is open for standard activities?

6) Weekend Operation: No ☐ Yes ☐ No

Is this the correct answer to whether the property includes regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity includes any time when the property is used for classes, performances, or other school or community activities, on one or both days of the weekend during one or more seasons of the year.

7) Number of Computers: 302.7 ← default ☐ **Yes** ☐ **No**

Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.

8) Cooking Facilities: 100% Yes ☐ **Yes** ☐ **No**

Is this the correct answer to whether the property has a commercial cooking area designed to provide and serve food to occupants and/or visitors? Commercial kitchens include restaurants and cafeterias, but not employee break room kitchens.

9) Gross Floor Area Used for Food Preparation: 0 ft^2 ← default ☐ **Yes** ☐ **No**

Is this the correct Gross Floor Area Used for Food Preparation? It is defined as the total size of all large/commercial kitchen areas used for the storage and preparation of food. It is a subset of the property Gross Floor Area. It should not include small kitchens, employee break rooms/pantries, concession stands, or service and seating areas.

10) Number of Walk-in Refrigeration/Freezer Units: 1 ☐ **Yes** ☐ **No**

Is this the total count of walk-in units at the property? The Number of Walk-in Refrigeration/Freezer Units is the total count of walk-in units at the property. Walk-in Refrigeration/Freezers are large enough for a person to actually walk into. They may or may not have a door, plastic strips, or other flexible covers.

11) Percent That Can Be Heated: 100 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be heated by mechanical equipment?

12) Percent That Can Be Cooled: 80 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.

13) Gymnasium Floor Area: 0 ft^2 ← default ☐ **Yes** ☐ **No**

Is this the correct floor area for the gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?

14) School District: Barnegat Twp ☐ **Yes** ☐ **No**

Is this the administrative school district in which the property is located?

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	4,591,761 (60%)
Electric - Solar (kBtu)	1,421,675.4 (19%)
Natural Gas (kBtu)	1,638,005.6 (21%)
Total Energy (kBtu)	7,651,442

Energy Intensity

Site (kBtu/ft²)	44.2
Source (kBtu/ft²)	92.5

National Median Comparison

National Median Site EUI (kBtu/ft²)	42.8
National Median Source EUI (kBtu/ft²)	89.6
% Diff from National Median Source EUI	3.3%

Emissions (based on site energy use)

Greenhouse Gas Emissions (Metric Tons CO2e)	552.2

Power Generation Plant or Distribution Utility:
Atlantic City Electric Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Energy Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values. **Note: please review all meter entries, making note of any unusual entries, and, if they are correct, provide a manual note to explain.**

Meter Name	Fuel Type	Start Date	End Date	Associated With:
Electric Grid Meter	Electric - Grid	01/26/2019	In Use	Barnegat Township School District; Russell O. Brackman Middle School
Natural Gas	Natural Gas	01/31/2019	In Use	Barnegat Township School District; Russell O. Brackman Middle School
Electric Solar Meter	Electric - Solar	02/21/2019	In Use	Barnegat Township School District; Russell O. Brackman Middle School

Total Energy Use ☐ **Yes** ☐ **No**

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels ☐ **Yes** ☐ **No**

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy ☐ **Yes** ☐ **No**

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric - Grid Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Barnegat Township School District; Russell O. Brackman Middle School

Start Date	End Date	Usage	Green Power?
01/26/2019	02/26/2019	157,358	No
02/27/2019	03/27/2019	113,958	No
03/28/2019	04/25/2019	78,666	No
04/26/2019	05/28/2019	99,890	No
05/29/2019	06/26/2019	94,506	No
06/27/2019	07/26/2019	100,336	No
07/27/2019	08/27/2019	124,086	No
08/28/2019	09/25/2019	96,874	No
09/26/2019	10/28/2019	100,280	No
10/29/2019	11/25/2019	109,039	No
11/26/2019	12/26/2019	125,360 ← estimate	No
12/27/2019	01/24/2020	141,682	No
01/25/2020	02/25/2020	151,944	No
		Total Consumption (kWh (thousand Watt-hours)):	1,493,979
		Total Consumption (kBtu (thousand Btu)):	5,097,456.3

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: Barnegat Township School District; Russell O. Brackman Middle School

Start Date	End Date	Usage
01/31/2019	03/04/2019	2,694 ← estimate
03/04/2019	04/01/2019	2,787.6
04/01/2019	05/03/2019	1,801.1
05/03/2019	06/05/2019	562.1
06/05/2019	07/03/2019	148.4
07/03/2019	08/02/2019	122.1
08/02/2019	08/30/2019	126
08/30/2019	09/26/2019	167.5
09/26/2019	11/01/2019	636.1
11/01/2019	11/27/2019	1,464.3
11/27/2019	01/03/2020	3,216.2
01/03/2020	01/30/2020	2,570.5
01/30/2020	03/02/2020	2,693.5
	Total Consumption (therms):	18,989.4
	Total Consumption (kBtu (thousand Btu)):	1,898,940

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric - Solar Meter: Electric Solar Meter (kWh (thousand Watt-hours))

Associated With: Barnegat Township School District; Russell O. Brackman Middle School

Start Date	End Date	Energy Used Onsite	Energy Exported Offsite	REC Ownership
02/21/2019	03/22/2019	38,505.98 ← estimate	0	Owned
03/23/2019	04/22/2019	43,929.5 ← estimate	0	Owned
04/23/2019	05/22/2019	49,516.59 ← estimate	0	Owned
05/23/2019	06/20/2019	47,588.2 ← estimate	0	Owned
06/21/2019	07/22/2019	49,637.2 ← estimate	0	Owned
07/23/2019	08/21/2019	44,779.7 ← estimate	0	Owned
08/22/2019	09/20/2019	38,015.07 ← estimate	0	Owned
09/21/2019	10/23/2019	30,514.2 ← estimate	0	Owned
10/24/2019	11/21/2019	23,855.6 ← estimate	0	Owned
11/22/2019	12/20/2019	19,246.3 ← estimate	0	Owned
12/21/2019	01/21/2020	22,264.7 ← estimate	0	Owned
01/22/2020	02/22/2020	28,211.75 ← estimate	0	Owned
		Total Consumption (kWh (thousand Watt-hours)):		436,064.79
		Total Consumption (kBtu (thousand Btu)):		1,487,853.1

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

____________________ (Name) visited this site on ____________ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature _________________________

Date _________

Licensed Professional

____ ________
,
(____)____-______
____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineering Stamp

(if applicable)

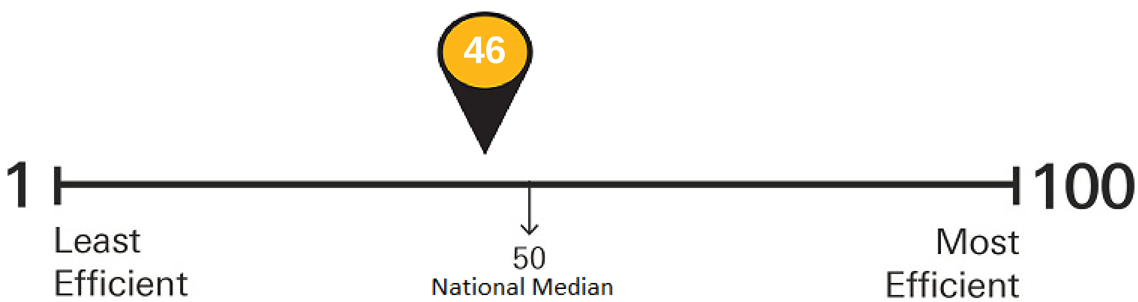
ENERGY STAR® Energy Performance Scorecard

46

out of 100

Russell O. Brackman Middle School

For Year Ending	January 31, 2020
Property Address	600 Barnegat Blvd. North Barnegat, New Jersey 08005
Primary Function	K-12 School
Gross Floor Area (ft²)	172,970
Year built	1989
Energy Use per sq. ft.*	44.2 kBtu



What is the ENERGY STAR Score?
The ENERGY STAR score rates commercial building's energy performance relative to similar buildings nationwide. Expressed as a number on a simple 1-100 scale, the score rates performance on a percentile basis: a building with a score of 50 performs better than 50% of its peers. Higher scores mean better energy efficiency, resulting in less energy use and fewer greenhouse gas emissions. If a 1-100 score for a specific building type has not been developed, Site Energy Use Intensity (EUI) will be displayed on this scorecard.

Learn more at:
energystar.gov/scorecard

*Site energy use

EPA United States Environmental Protection Agency

Date Generated: May 22, 2020

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

46

ENERGY STAR® Score[1]

Russell O. Brackman Middle School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 172,970
Built: 1989

For Year Ending: January 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Russell O. Brackman Middle School 600 Barnegat Blvd. North Barnegat, New Jersey 08005	_______________ , (____)____-______	____ ________ , (____)____-______ _______________

Property ID: 10497358

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
44.2 kBtu/ft²

Source EUI
92.5 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	4,591,761 (60%)
Electric - Solar (kBtu)	1,421,675 (19%)
Natural Gas (kBtu)	1,638,006 (21%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	42.8
National Median Source EUI (kBtu/ft²)	89.6
% Diff from National Median Source EUI	3%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	552

Signature & Stamp of Verifying Professional

I _________________ (Name) verify that the above information is true and correct to the best of my knowledge.

LP Signature: ______________________Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer or Registered Architect Stamp (if applicable)

ENERGY STAR® Data Verification Checklist

LEARN MORE AT energystar.gov

61

ENERGY STAR ® Score[1]

Cecil S. Collins Elementary School

Registry Name: Cecil S. Collins Elementary School
Property Type: K-12 School
Gross Floor Area (ft²): 86,000
Built: 1980

For Year Ending: Jan 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Cecil S. Collins Elementary School
570 Barnegat Blvd. North
Barnegat, New Jersey 08005

Property ID: 10497415

Property Owner
____
,
(____)____-______

Primary Contact
____ ________
,
(____)____-______
____

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Cecil S. Collins Elementary School ☐ **Yes** ☐ **No**

Is this the official name of the property?

If "No", please specify: _____________________________________

2) Property Type: K-12 School ☐ **Yes** ☐ **No**

Is this an accurate description of the primary use of this property?

3) Location: ☐ **Yes** ☐ **No**

570 Barnegat Blvd. North
Barnegat, New Jersey 08005

Is this correct and complete?

4) Gross Floor Area: 86,000 ft² ☐ **Yes** ☐ **No**

Is value an accurate account of the gross floor area for the property?

5) Average Occupancy (%): 85 ☐ **Yes** ☐ **No**

Is this occupancy percentage accurate for the entire 12 month period being assessed?

6) Number of Buildings: 1 ☐ **Yes** ☐ **No**

Does this number accurately represent all structures?

7) Whole Property Verification: ☐ **Yes** ☐ **No**

Does this application represent the entire property? If any space or energy use has been excluded from this property, please describe it in the notes section below.

Notes:

Indoor Environmental Quality

1) Outdoor Air Ventilation ☐ **Yes** ☐ **No**

Were measurements and/or calculations taken and recorded under normal building operating conditions using an allowable method as described in the Licensed Professional's Guide which demonstrate this property meets the minimum ventilation rates according to ANSI/ ASHRAE Standard 62?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

2) Thermal Environmental Conditions ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the Licensed Professional's Guide which demonstrate this property meets the acceptable thermal environmental conditions according to ANSI/ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

3) Illumination ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the LP Guide which demonstrate this property meets minimum recommended illumination levels according to the most recent version of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

Notes:

2. Review of Property Use Details

K-12 School: Building Use

☆ This Use Detail is used to calculate the 1-100 ENERGY STAR Score.

★ **1) Gross Floor Area:** 86,000 ft² ☐ **Yes** ☐ **No**

Is this the total size, as measured between the outside surface of the exterior walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

★ **2) High School:** No ☐ **Yes** ☐ **No**

Is this is the correct answer to whether the property is a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, then it is a high school. For example, if the school teaches grades K-12 (elementary/middle and high school), then it is considered a high school.

★ **3) Number of Workers on Main Shift:** 40 ☐ **Yes** ☐ **No**

Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

4) Student Seating Capacity: 472 ☐ **Yes** ☐ **No**

Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.

5) Months in Use: 9 ☐ **Yes** ☐ **No**

Is this the total number of months that the property is open for standard activities?

★ **6) Weekend Operation:** No ☐ **Yes** ☐ **No**

Is this the correct answer to whether the property includes regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity includes any time when the property is used for classes, performances, or other school or community activities, on one or both days of the weekend during one or more seasons of the year.

7) Number of Computers: 160 ← default ☐ **Yes** ☐ **No**

Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.

★ **8) Cooking Facilities:** 100% Yes ☐ **Yes** ☐ **No**

Is this the correct answer to whether the property has a commercial cooking area designed to provide and serve food to occupants and/or visitors? Commercial kitchens include restaurants and cafeterias, but not employee break room kitchens.

9) Gross Floor Area Used for Food Preparation: 0 ft^2 ← default ☐ **Yes** ☐ **No**

Is this the correct Gross Floor Area Used for Food Preparation? It is defined as the total size of all large/commercial kitchen areas used for the storage and preparation of food. It is a subset of the property Gross Floor Area. It should not include small kitchens, employee break rooms/pantries, concession stands, or service and seating areas.

10) Number of Walk-in Refrigeration/Freezer Units: 1 ☐ **Yes** ☐ **No**

Is this the total count of walk-in units at the property? The Number of Walk-in Refrigeration/Freezer Units is the total count of walk-in units at the property. Walk-in Refrigeration/Freezers are large enough for a person to actually walk into. They may or may not have a door, plastic strips, or other flexible covers.

★ **11) Percent That Can Be Heated:** 100 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be heated by mechanical equipment?

★ **12) Percent That Can Be Cooled:** 80 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.

13) Gymnasium Floor Area: 0 ft^2 ← default ☐ **Yes** ☐ **No**

Is this the correct floor area for the gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?

14) School District: Barnegat Twp ☐ **Yes** ☐ **No**

Is this the administrative school district in which the property is located?

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Grid (kBtu)	1,244,943.3 (26%)
Electric - Solar (kBtu)	1,184,088.8 (25%)
Natural Gas (kBtu)	2,379,712 (50%)
Total Energy (kBtu)	4,808,744.1

National Median Comparison

National Median Site EUI (kBtu/ft²)	63
National Median Source EUI (kBtu/ft²)	93.9
% Diff from National Median Source EUI	-11.2%

Energy Intensity

Site (kBtu/ft²)	55.9
Source (kBtu/ft²)	83.4

Emissions (based on site energy use)

Greenhouse Gas Emissions (Metric Tons CO2e)	252.5

Power Generation Plant or Distribution Utility:
Atlantic City Electric Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Energy Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values. **Note: please review all meter entries, making note of any unusual entries, and, if they are correct, provide a manual note to explain.**

Meter Name	Fuel Type	Start Date	End Date	Associated With:
Electric Solar Meter	Electric - Solar	02/21/2019	In Use	Barnegat Township School District; Cecil S. Collins Elementary School
Electric Grid Meter	Electric - Grid	01/26/2019	In Use	Barnegat Township School District; Cecil S. Collins Elementary School
Natural Gas	Natural Gas	01/31/2019	In Use	Barnegat Township School District; Cecil S. Collins Elementary School

Total Energy Use ☐ **Yes** ☐ **No**

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels ☐ **Yes** ☐ **No**

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy ☐ **Yes** ☐ **No**

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric - Solar Meter: Electric Solar Meter (kWh (thousand Watt-hours))

Associated With: Barnegat Township School District; Cecil S. Collins Elementary School

Start Date	End Date	Energy Used Onsite	Energy Exported Offsite	REC Ownership
02/21/2019	03/22/2019	32,055.53 ← estimate	0	Owned
03/23/2019	04/22/2019	37,424 ← estimate	0	Owned
04/23/2019	05/22/2019	41,164.39 ← estimate	0	Owned
05/23/2019	06/20/2019	39,673.01 ← estimate	0	Owned
06/21/2019	07/22/2019	41,224.2 ← estimate	0	Owned
07/23/2019	08/21/2019	37,473.59 ← estimate	0	Owned
08/22/2019	09/20/2019	31,767.1 ← estimate	0	Owned
09/21/2019	10/23/2019	25,064.58 ← estimate	0	Owned
10/24/2019	11/21/2019	18,192.1 ← estimate	0	Owned
11/22/2019	12/20/2019	16,014.91 ← estimate	0	Owned
12/21/2019	01/21/2020	19,600.8 ← estimate	0	Owned
01/22/2020	02/22/2020	23,623.6 ← estimate	0	Owned
		Total Consumption (kWh (thousand Watt-hours)):		363,277.81
		Total Consumption (kBtu (thousand Btu)):		1,239,503.9

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric - Grid Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Barnegat Township School District; Cecil S. Collins Elementary School

Start Date	End Date	Usage	Green Power?
01/26/2019	02/26/2019	37,134	No
02/27/2019	03/27/2019	28,142	No
03/28/2019	04/25/2019	21,634	No
04/26/2019	05/28/2019	21,921	No
05/29/2019	06/26/2019	24,931	No
06/27/2019	07/26/2019	27,975	No
07/27/2019	08/27/2019	28,853	No
08/28/2019	09/25/2019	26,280	No
09/26/2019	10/28/2019	31,419	No
10/29/2019	11/25/2019	35,781	No
11/26/2019	12/26/2019	38,052 ← estimate	No
12/27/2019	01/24/2020	40,323	No
01/25/2020	02/25/2020	42,924	No
		Total Consumption (kWh (thousand Watt-hours)):	405,369
		Total Consumption (kBtu (thousand Btu)):	1,383,119

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: Barnegat Township School District; Cecil S. Collins Elementary School

Start Date	End Date	Usage
01/31/2019	03/04/2019	4,198 ← estimate
03/04/2019	04/01/2019	4,313.1
04/01/2019	05/03/2019	1,557.6
05/03/2019	06/05/2019	281.07
06/05/2019	07/03/2019	106.8
07/03/2019	08/02/2019	71.15
08/02/2019	08/30/2019	77.31
08/30/2019	09/26/2019	203.2
09/26/2019	11/01/2019	781.49
11/01/2019	11/27/2019	2,952.6
11/27/2019	01/03/2020	5,202.9
01/03/2020	01/30/2020	3,920.69
01/30/2020	03/02/2020	4,198.4
	Total Consumption (therms):	27,864.31
	Total Consumption (kBtu (thousand Btu)):	2,786,431

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

___________________ (Name) visited this site on ___________ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature _______________________

Date _________

Licensed Professional

____ ________

,

(____)____-______

____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineering Stamp

(if applicable)

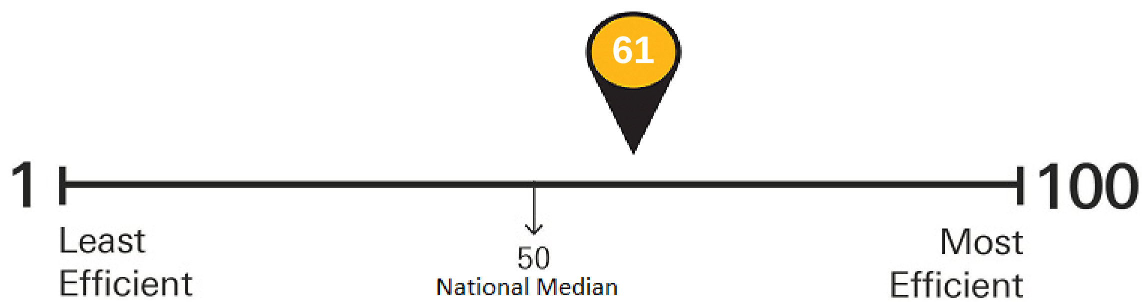
ENERGY STAR® Energy Performance Scorecard

61

out of 100

Cecil S. Collins Elementary School

For Year Ending	January 31, 2020
Property Address	570 Barnegat Blvd. North Barnegat, New Jersey 08005
Primary Function	K-12 School
Gross Floor Area (ft²)	86,000
Year built	1980
Energy Use per sq. ft.*	55.9 kBtu



What is the ENERGY STAR Score?
The ENERGY STAR score rates commercial building's energy performance relative to similar buildings nationwide. Expressed as a number on a simple 1-100 scale, the score rates performance on a percentile basis: a building with a score of 50 performs better than 50% of its peers. Higher scores mean better energy efficiency, resulting in less energy use and fewer greenhouse gas emissions. If a 1-100 score for a specific building type has not been developed, Site Energy Use Intensity (EUI) will be displayed on this scorecard.

Learn more at:
energystar.gov/scorecard

*Site energy use

United States Environmental Protection Agency

Date Generated: May 22, 2020

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

61

ENERGY STAR® Score[1]

Cecil S. Collins Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 86,000
Built: 1980

For Year Ending: January 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Cecil S. Collins Elementary School 570 Barnegat Blvd. North Barnegat, New Jersey 08005	_________________ , (____)____-______	____ ________ , (____)____-______ _________________

Property ID: 10497415

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
55.9 kBtu/ft²

Source EUI
83.4 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	1,244,943 (26%)
Electric - Solar (kBtu)	1,184,089 (25%)
Natural Gas (kBtu)	2,379,712 (50%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	63
National Median Source EUI (kBtu/ft²)	93.9
% Diff from National Median Source EUI	-11%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	252

Signature & Stamp of Verifying Professional

I _________________ (Name) verify that the above information is true and correct to the best of my knowledge.

LP Signature: ______________________Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer or Registered Architect Stamp
(if applicable)

ENERGY STAR® Data Verification Checklist

68

ENERGY STAR ® Score[1]

Lillian M. Dunfee Elementary School

Registry Name: Lillian M. Dunfee Elementary School
Property Type: K-12 School
Gross Floor Area (ft²): 70,817
Built: 1974

For Year Ending: Jan 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Lillian M. Dunfee Elementary School 128 Barnegat Blvd. Barnegat, New Jersey 08005 **Property ID**: 10497364	__________________ , (____)____-______	____ ________ , (____)____-______ __________________

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Lillian M. Dunfee Elementary School ☐ **Yes** ☐ **No**

Is this the official name of the property?

If "No", please specify: ______________________________________

2) Property Type: K-12 School ☐ **Yes** ☐ **No**

Is this an accurate description of the primary use of this property?

3) Location: ☐ **Yes** ☐ **No**

128 Barnegat Blvd.
Barnegat, New Jersey 08005

Is this correct and complete?

4) Gross Floor Area: 70,817 ft² ☐ **Yes** ☐ **No**

Is value an accurate account of the gross floor area for the property?

5) Average Occupancy (%): 85 ☐ **Yes** ☐ **No**

Is this occupancy percentage accurate for the entire 12 month period being assessed?

6) Number of Buildings: 1 ☐ **Yes** ☐ **No**

Does this number accurately represent all structures?

7) Whole Property Verification: ☐ **Yes** ☐ **No**

Does this application represent the entire property? If any space or energy use has been excluded from this property, please describe it in the notes section below.

Notes:

Indoor Environmental Quality

1) Outdoor Air Ventilation ☐ **Yes** ☐ **No**

Were measurements and/or calculations taken and recorded under normal building operating conditions using an allowable method as described in the Licensed Professional's Guide which demonstrate this property meets the minimum ventilation rates according to ANSI/ ASHRAE Standard 62?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

2) Thermal Environmental Conditions ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the Licensed Professional's Guide which demonstrate this property meets the acceptable thermal environmental conditions according to ANSI/ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

3) Illumination ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the LP Guide which demonstrate this property meets minimum recommended illumination levels according to the most recent version of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

Notes:

2. Review of Property Use Details

K-12 School: Building Use

This Use Detail is used to calculate the 1-100 ENERGY STAR Score.

1) Gross Floor Area: 70,817 ft² ☐ Yes ☐ No

Is this the total size, as measured between the outside surface of the exterior walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) High School: No ☐ Yes ☐ No

Is this is the correct answer to whether the property is a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, then it is a high school. For example, if the school teaches grades K-12 (elementary/middle and high school), then it is considered a high school.

3) Number of Workers on Main Shift: 40 ☐ Yes ☐ No

Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

4) Student Seating Capacity: 387 ☐ Yes ☐ No

Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.

5) Months in Use: 9 ☐ Yes ☐ No

Is this the total number of months that the property is open for standard activities?

6) Weekend Operation: No ☐ Yes ☐ No

Is this the correct answer to whether the property includes regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity includes any time when the property is used for classes, performances, or other school or community activities, on one or both days of the weekend during one or more seasons of the year.

7) Number of Computers: 123.93 ← default ☐ **Yes** ☐ **No**

Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.

8) Cooking Facilities: 100% Yes ☐ **Yes** ☐ **No**

Is this the correct answer to whether the property has a commercial cooking area designed to provide and serve food to occupants and/or visitors? Commercial kitchens include restaurants and cafeterias, but not employee break room kitchens.

9) Gross Floor Area Used for Food Preparation: 0 ft² ← default ☐ **Yes** ☐ **No**

Is this the correct Gross Floor Area Used for Food Preparation? It is defined as the total size of all large/commercial kitchen areas used for the storage and preparation of food. It is a subset of the property Gross Floor Area. It should not include small kitchens, employee break rooms/pantries, concession stands, or service and seating areas.

10) Number of Walk-in Refrigeration/Freezer Units: 1 ☐ **Yes** ☐ **No**

Is this the total count of walk-in units at the property? The Number of Walk-in Refrigeration/Freezer Units is the total count of walk-in units at the property. Walk-in Refrigeration/Freezers are large enough for a person to actually walk into. They may or may not have a door, plastic strips, or other flexible covers.

11) Percent That Can Be Heated: 100 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be heated by mechanical equipment?

12) Percent That Can Be Cooled: 80 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.

13) Gymnasium Floor Area: 0 ft² ← default ☐ **Yes** ☐ **No**

Is this the correct floor area for the gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?

14) School District: Barnegat Twp ☐ **Yes** ☐ **No**

Is this the administrative school district in which the property is located?

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Electric - Solar (kBtu)	206,820.6 (6%)
Electric - Grid (kBtu)	1,282,291.3 (40%)
Natural Gas (kBtu)	1,700,154.4 (53%)
Total Energy (kBtu)	3,189,266.3

Energy Intensity

Site (kBtu/ft²)	45
Source (kBtu/ft²)	78.8

National Median Comparison

National Median Site EUI (kBtu/ft²)	55
National Median Source EUI (kBtu/ft²)	96.3
% Diff from National Median Source EUI	-18.2%

Emissions (based on site energy use)

Greenhouse Gas Emissions (Metric Tons CO2e)	220.2

Power Generation Plant or Distribution Utility:
Atlantic City Electric Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Energy Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values. **Note: please review all meter entries, making note of any unusual entries, and, if they are correct, provide a manual note to explain.**

Meter Name	Fuel Type	Start Date	End Date	Associated With:
Electric Grid Meter	Electric - Grid	01/26/2019	In Use	Lillian M. Dunfee Elementary School; Barnegat Township School District
Natural Gas	Natural Gas	01/31/2019	In Use	Lillian M. Dunfee Elementary School; Barnegat Township School District
Electric Solar Meter	Electric - Solar	02/21/2019	In Use	Lillian M. Dunfee Elementary School; Barnegat Township School District

Total Energy Use ☐ **Yes** ☐ **No**

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels ☐ **Yes** ☐ **No**

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy ☐ **Yes** ☐ **No**

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric - Grid Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Lillian M. Dunfee Elementary School; Barnegat Township School District

Start Date	End Date	Usage	Green Power?
01/26/2019	02/26/2019	50,846	No
02/27/2019	03/27/2019	35,159	No
03/28/2019	04/25/2019	24,607	No
04/26/2019	05/28/2019	25,304	No
05/29/2019	06/26/2019	25,749	No
06/27/2019	07/26/2019	23,056	No
07/27/2019	08/27/2019	26,440	No
08/28/2019	09/25/2019	25,781	No
09/26/2019	10/28/2019	32,823	No
10/29/2019	11/25/2019	31,565	No
11/26/2019	12/26/2019	35,128 ← estimate	No
12/27/2019	01/24/2020	38,691	No
01/25/2020	02/25/2020	46,641	No
		Total Consumption (kWh (thousand Watt-hours)):	421,790
		Total Consumption (kBtu (thousand Btu)):	1,439,147.5

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: Lillian M. Dunfee Elementary School; Barnegat Township School District

Start Date	End Date	Usage
01/31/2019	03/06/2019	2,632 ← estimate
03/06/2019	04/03/2019	2,691
04/03/2019	05/07/2019	1,500.3
05/07/2019	06/04/2019	564.5
06/04/2019	07/08/2019	285.01
07/08/2019	08/05/2019	213.4
08/05/2019	08/29/2019	115.3
08/29/2019	09/27/2019	46.3
09/27/2019	11/01/2019	639.7
11/01/2019	12/02/2019	2,569.8
12/02/2019	01/06/2020	3,317.6 ← estimate
01/06/2020	01/31/2020	2,419.15
01/31/2020	03/02/2020	2,631.78
	Total Consumption (therms):	19,625.84
	Total Consumption (kBtu (thousand Btu)):	1,962,584

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric - Solar Meter: Electric Solar Meter (kWh (thousand Watt-hours))

Associated With: Lillian M. Dunfee Elementary School; Barnegat Township School District

Start Date	End Date	Energy Used Onsite	Energy Exported Offsite	REC Ownership
02/21/2019	03/22/2019	5,634.6 ← estimate	0	Owned
03/23/2019	04/22/2019	6,248.52 ← estimate	0	Owned
04/23/2019	05/22/2019	6,540.6 ← estimate	0	Owned
05/23/2019	06/20/2019	6,549.3 ← estimate	0	Owned
06/21/2019	07/22/2019	6,718.4 ← estimate	0	Owned
07/23/2019	08/21/2019	6,229.1 ← estimate	0	Owned
08/22/2019	09/20/2019	5,541.35 ← estimate	0	Owned
09/21/2019	10/23/2019	4,717 ← estimate	0	Owned
10/24/2019	11/21/2019	3,743.1 ← estimate	0	Owned
11/22/2019	12/20/2019	3,547.48 ← estimate	0	Owned
12/21/2019	01/21/2020	3,785.45 ← estimate	0	Owned
01/22/2020	02/22/2020	4,354.4 ← estimate	0	Owned
		Total Consumption (kWh (thousand Watt-hours)):		63,609.3
		Total Consumption (kBtu (thousand Btu)):		217,034.9

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

____________________ (Name) visited this site on ___________ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature ________________________

Date _________

Licensed Professional

____ ________
,
(____)____-______
____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineering Stamp

(if applicable)

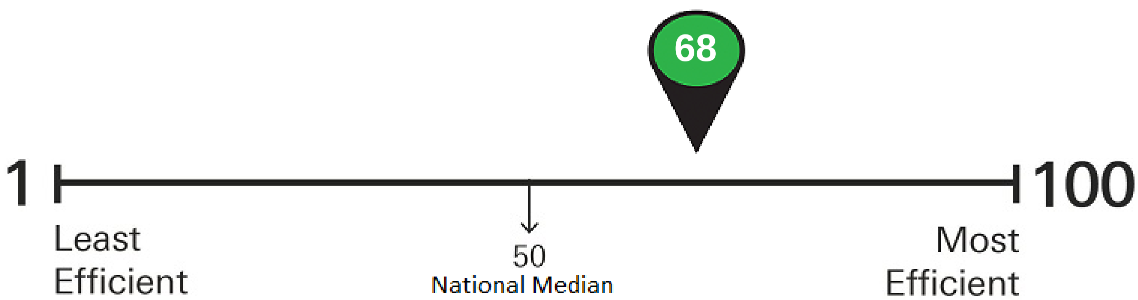
ENERGY STAR® Energy Performance Scorecard

68

out of 100

Lillian M. Dunfee Elementary School

For Year Ending	January 31, 2020
Property Address	128 Barnegat Blvd. Barnegat, New Jersey 08005
Primary Function	K-12 School
Gross Floor Area (ft²)	70,817
Year built	1974
Energy Use per sq. ft.*	45 kBtu



What is the ENERGY STAR Score?
The ENERGY STAR score rates commercial building's energy performance relative to similar buildings nationwide. Expressed as a number on a simple 1-100 scale, the score rates performance on a percentile basis: a building with a score of 50 performs better than 50% of its peers. Higher scores mean better energy efficiency, resulting in less energy use and fewer greenhouse gas emissions. If a 1-100 score for a specific building type has not been developed, Site Energy Use Intensity (EUI) will be displayed on this scorecard.

Learn more at:
energystar.gov/scorecard

*Site energy use

EPA United States Environmental Protection Agency

Date Generated: May 22, 2020

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

68

ENERGY STAR® Score[1]

Lillian M. Dunfee Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 70,817
Built: 1974

For Year Ending: January 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Lillian M. Dunfee Elementary School 128 Barnegat Blvd. Barnegat, New Jersey 08005	__________________ , (____)____-______	____ ________ , (____)____-______ __________________

Property ID: 10497364

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
45 kBtu/ft²

Source EUI
78.8 kBtu/ft²

Annual Energy by Fuel

Electric - Solar (kBtu)	206,821 (6%)
Electric - Grid (kBtu)	1,282,291 (40%)
Natural Gas (kBtu)	1,700,154 (53%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	55
National Median Source EUI (kBtu/ft²)	96.3
% Diff from National Median Source EUI	-18%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	220

Signature & Stamp of Verifying Professional

I ___________________ (Name) verify that the above information is true and correct to the best of my knowledge.

LP Signature: _________________________Date: ____________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer or Registered Architect Stamp (if applicable)

ENERGY STAR® Data Verification Checklist

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41

ENERGY STAR ® Score[1]

Joseph T. Donahue Elementary School

Registry Name: Joseph T. Donahue Elementary School
Property Type: K-12 School
Gross Floor Area (ft²): 72,402
Built: 2008

For Year Ending: Jan 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Joseph T. Donahue Elementary School 200 Bengal Boulevard Barnegat, New Jersey 08005 **Property ID**: 10497412	__________________ , (____)____-______	____ ________ , (____)____-______ __________________

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Joseph T. Donahue Elementary School ☐ **Yes** ☐ **No**

Is this the official name of the property?

If "No", please specify: ______________________________________

2) Property Type: K-12 School ☐ **Yes** ☐ **No**

Is this an accurate description of the primary use of this property?

3) Location: ☐ **Yes** ☐ **No**

200 Bengal Boulevard
Barnegat, New Jersey 08005

Is this correct and complete?

4) Gross Floor Area: 72,402 ft² ☐ **Yes** ☐ **No**

Is value an accurate account of the gross floor area for the property?

5) Average Occupancy (%): 85 ☐ **Yes** ☐ **No**

Is this occupancy percentage accurate for the entire 12 month period being assessed?

6) Number of Buildings: 1 ☐ **Yes** ☐ **No**

Does this number accurately represent all structures?

7) Whole Property Verification: ☐ **Yes** ☐ **No**

Does this application represent the entire property? If any space or energy use has been excluded from this property, please describe it in the notes section below.

Notes:

Indoor Environmental Quality

1) Outdoor Air Ventilation ☐ **Yes** ☐ **No**

Were measurements and/or calculations taken and recorded under normal building operating conditions using an allowable method as described in the Licensed Professional's Guide which demonstrate this property meets the minimum ventilation rates according to ANSI/ ASHRAE Standard 62?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

2) Thermal Environmental Conditions ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the Licensed Professional's Guide which demonstrate this property meets the acceptable thermal environmental conditions according to ANSI/ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

3) Illumination ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the LP Guide which demonstrate this property meets minimum recommended illumination levels according to the most recent version of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

Notes:

2. Review of Property Use Details

K-12 School: Building Use

This Use Detail is used to calculate the 1-100 ENERGY STAR Score.

1) Gross Floor Area: 72,402 ft² ☐ Yes ☐ No

Is this the total size, as measured between the outside surface of the exterior walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) High School: No ☐ Yes ☐ No

Is this is the correct answer to whether the property is a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, then it is a high school. For example, if the school teaches grades K-12 (elementary/middle and high school), then it is considered a high school.

3) Number of Workers on Main Shift: 40 ☐ Yes ☐ No

Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

4) Student Seating Capacity: 220 ☐ Yes ☐ No

Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.

5) Months in Use: 9 ☐ Yes ☐ No

Is this the total number of months that the property is open for standard activities?

6) Weekend Operation: No ☐ Yes ☐ No

Is this the correct answer to whether the property includes regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity includes any time when the property is used for classes, performances, or other school or community activities, on one or both days of the weekend during one or more seasons of the year.

7) Number of Computers: 126.7 ← default ☐ Yes ☐ No

Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.

8) Cooking Facilities: 100% Yes ☐ Yes ☐ No

Is this the correct answer to whether the property has a commercial cooking area designed to provide and serve food to occupants and/or visitors? Commercial kitchens include restaurants and cafeterias, but not employee break room kitchens.

9) Gross Floor Area Used for Food Preparation: 0 ft² ← default ☐ Yes ☐ No

Is this the correct Gross Floor Area Used for Food Preparation? It is defined as the total size of all large/commercial kitchen areas used for the storage and preparation of food. It is a subset of the property Gross Floor Area. It should not include small kitchens, employee break rooms/pantries, concession stands, or service and seating areas.

10) Number of Walk-in Refrigeration/Freezer Units: 1 ☐ Yes ☐ No

Is this the total count of walk-in units at the property? The Number of Walk-in Refrigeration/Freezer Units is the total count of walk-in units at the property. Walk-in Refrigeration/Freezers are large enough for a person to actually walk into. They may or may not have a door, plastic strips, or other flexible covers.

11) Percent That Can Be Heated: 100 ☐ Yes ☐ No

Is this the total percentage of the property that can be heated by mechanical equipment?

12) Percent That Can Be Cooled: 80 ☐ Yes ☐ No

Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.

13) Gymnasium Floor Area: 0 ft² ← default ☐ Yes ☐ No

Is this the correct floor area for the gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?

14) School District: Barnegat Twp ☐ Yes ☐ No

Is this the administrative school district in which the property is located?

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary

Natural Gas (kBtu)	1,296,753.7 (34%)
Electric - Solar (kBtu)	459,545.8 (12%)
Electric - Grid (kBtu)	2,048,768.1 (54%)
Total Energy (kBtu)	3,805,067.7

Energy Intensity

Site (kBtu/ft²)	52.6
Source (kBtu/ft²)	104.4

National Median Comparison

National Median Site EUI (kBtu/ft²)	48.4
National Median Source EUI (kBtu/ft²)	96
% Diff from National Median Source EUI	8.7%

Emissions (based on site energy use)

Greenhouse Gas Emissions (Metric Tons CO2e)	276.4

Power Generation Plant or Distribution Utility:
Atlantic City Electric Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Energy Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values. **Note: please review all meter entries, making note of any unusual entries, and, if they are correct, provide a manual note to explain.**

Meter Name	Fuel Type	Start Date	End Date	Associated With:
Electric Solar Meter	Electric - Solar	02/21/2019	In Use	Joseph T. Donahue Elementary School; Barnegat Township School District
Electric Grid Meter	Electric - Grid	01/26/2019	In Use	Joseph T. Donahue Elementary School; Barnegat Township School District
Natural Gas	Natural Gas	01/31/2019	In Use	Joseph T. Donahue Elementary School; Barnegat Township School District

Total Energy Use ☐ **Yes** ☐ **No**

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels ☐ **Yes** ☐ **No**

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy ☐ **Yes** ☐ **No**

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric - Solar Meter: Electric Solar Meter (kWh (thousand Watt-hours))

Associated With: Joseph T. Donahue Elementary School; Barnegat Township School District

Start Date	End Date	Energy Used Onsite	Energy Exported Offsite	REC Ownership
02/21/2019	03/22/2019	12,521.4 ← estimate	0	Owned
03/23/2019	04/22/2019	13,885.61 ← estimate	0	Owned
04/23/2019	05/22/2019	14,534.8 ← estimate	0	Owned
05/23/2019	06/20/2019	14,554 ← estimate	0	Owned
06/21/2019	07/22/2019	14,929.7 ← estimate	0	Owned
07/23/2019	08/21/2019	13,826 ← estimate	0	Owned
08/22/2019	09/20/2019	12,314.11 ← estimate	0	Owned
09/21/2019	10/23/2019	10,482.25 ← estimate	0	Owned
10/24/2019	11/21/2019	8,318.11 ← estimate	0	Owned
11/22/2019	12/20/2019	7,883.2 ← estimate	0	Owned
12/21/2019	01/21/2020	8,412.1 ← estimate	0	Owned
01/22/2020	02/22/2020	9,676.46 ← estimate	0	Owned
		Total Consumption (kWh (thousand Watt-hours)):		141,337.74
		Total Consumption (kBtu (thousand Btu)):		482,244.4

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric - Grid Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Joseph T. Donahue Elementary School; Barnegat Township School District

Start Date	End Date	Usage	Green Power?
01/26/2019	02/26/2019	83,900	No
02/27/2019	03/27/2019	56,834	No
03/28/2019	04/25/2019	27,146	No
04/26/2019	05/28/2019	32,888	No
05/29/2019	06/26/2019	38,361	No
06/27/2019	07/26/2019	43,920	No
07/27/2019	08/27/2019	53,007	No
08/28/2019	09/25/2019	45,119	No
09/26/2019	10/28/2019	43,093	No
10/29/2019	11/25/2019	53,571	No
11/26/2019	12/26/2019	64,050 ← estimate	No
12/27/2019	01/24/2020	60,425	No
01/25/2020	02/25/2020	63,437	No
		Total Consumption (kWh (thousand Watt-hours)):	665,751
		Total Consumption (kBtu (thousand Btu)):	2,271,542.4

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: Joseph T. Donahue Elementary School; Barnegat Township School District

Start Date	End Date	Usage
01/31/2019	03/07/2019	2,379 ← estimate
03/07/2019	04/05/2019	2,023.68
04/05/2019	05/08/2019	506.08
05/08/2019	06/07/2019	310.8
06/07/2019	07/09/2019	268.3
07/09/2019	08/05/2019	237.19
08/05/2019	09/03/2019	112.9
09/03/2019	10/01/2019	205.59
10/01/2019	11/01/2019	214.43
11/01/2019	12/05/2019	1,973.58
12/05/2019	01/07/2020	2,682.17
01/07/2020	01/31/2020	2,049.71
01/31/2020	03/04/2020	2,378.59
	Total Consumption (therms):	15,342.02
	Total Consumption (kBtu (thousand Btu)):	1,534,202

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

___________________ (Name) visited this site on ___________ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature _______________________

Date _________

Licensed Professional

____ ________
,
(____)____-______
____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineering Stamp

(if applicable)

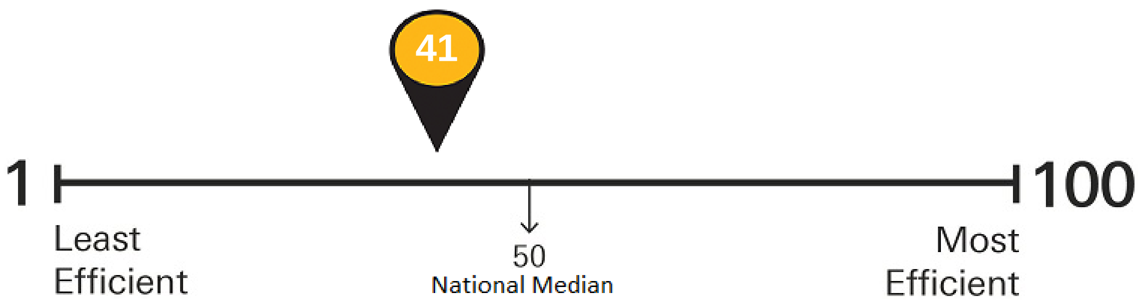
ENERGY STAR® Energy Performance Scorecard

41

out of 100

Joseph T. Donahue Elementary School

For Year Ending	January 31, 2020
Property Address	200 Bengal Boulevard Barnegat, New Jersey 08005
Primary Function	K-12 School
Gross Floor Area (ft²)	72,402
Year built	2008
Energy Use per sq. ft.*	52.6 kBtu



What is the ENERGY STAR Score?
The ENERGY STAR score rates commercial building's energy performance relative to similar buildings nationwide. Expressed as a number on a simple 1-100 scale, the score rates performance on a percentile basis: a building with a score of 50 performs better than 50% of its peers. Higher scores mean better energy efficiency, resulting in less energy use and fewer greenhouse gas emissions. If a 1-100 score for a specific building type has not been developed, Site Energy Use Intensity (EUI) will be displayed on this scorecard.

Learn more at:
energystar.gov/scorecard

*Site energy use

EPA United States Environmental Protection Agency

Date Generated: May 22, 2020

ENERGY STAR® Statement of Energy Performance

41

ENERGY STAR® Score[1]

Joseph T. Donahue Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 72,402
Built: 2008

For Year Ending: January 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Joseph T. Donahue Elementary School 200 Bengal Boulevard Barnegat, New Jersey 08005	______________ , (____)____-______	____ ________ , (____)____-______ ______________

Property ID: 10497412

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
52.6 kBtu/ft²

Source EUI
104.4 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	1,296,754 (34%)
Electric - Solar (kBtu)	459,546 (12%)
Electric - Grid (kBtu)	2,048,768 (54%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	48.4
National Median Source EUI (kBtu/ft²)	96
% Diff from National Median Source EUI	9%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	276

Signature & Stamp of Verifying Professional

I ________________ (Name) verify that the above information is true and correct to the best of my knowledge.

LP Signature: ______________________Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer or Registered Architect Stamp (if applicable)

ENERGY STAR® Data Verification Checklist

LEARN MORE AT energystar.gov

42

ENERGY STAR ® Score[1]

Robert L. Horbelt Elementary School

Registry Name: Robert L. Horbelt Elementary School
Property Type: K-12 School
Gross Floor Area (ft²): 80,856
Built: 2001

For Year Ending: Jan 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-to-100 assessment of a building's energy efficiency as compared with similar building nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Robert L. Horbelt Elementary School 104 Burr Street Barnegat, New Jersey 08005 **Property ID**: 10497416	____________________ , (____)____-______	____ _________ , (____)____-______ ____________________

1. Review of Whole Property Characteristics

Basic Property Information

1) Property Name: Robert L. Horbelt Elementary School ☐ **Yes** ☐ **No**

Is this the official name of the property?

If "No", please specify: ____

2) Property Type: K-12 School ☐ **Yes** ☐ **No**

Is this an accurate description of the primary use of this property?

3) Location: ☐ **Yes** ☐ **No**

104 Burr Street
Barnegat, New Jersey 08005

Is this correct and complete?

4) Gross Floor Area: 80,856 ft² ☐ **Yes** ☐ **No**

Is value an accurate account of the gross floor area for the property?

5) Average Occupancy (%): 85 ☐ **Yes** ☐ **No**

Is this occupancy percentage accurate for the entire 12 month period being assessed?

6) Number of Buildings: 1 ☐ **Yes** ☐ **No**

Does this number accurately represent all structures?

7) Whole Property Verification: ☐ **Yes** ☐ **No**

Does this application represent the entire property? If any space or energy use has been excluded from this property, please describe it in the notes section below.

Notes:

Indoor Environmental Quality

1) Outdoor Air Ventilation ☐ **Yes** ☐ **No**

Were measurements and/or calculations taken and recorded under normal building operating conditions using an allowable method as described in the Licensed Professional's Guide which demonstrate this property meets the minimum ventilation rates according to ANSI/ ASHRAE Standard 62?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

2) Thermal Environmental Conditions ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the Licensed Professional's Guide which demonstrate this property meets the acceptable thermal environmental conditions according to ANSI/ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

3) Illumination ☐ **Yes** ☐ **No**

Were measurements taken and recorded per the LP Guide which demonstrate this property meets minimum recommended illumination levels according to the most recent version of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook?

[NOTE: In the case of an audit of this application, Appendix A: IEQ Measurement Form from the LP Guide, will be required to be completed and submitted to EPA. Failure to submit measurements will result in a denial of the application.]

Notes:

2. Review of Property Use Details

K-12 School: Building Use

This Use Detail is used to calculate the 1-100 ENERGY STAR Score.

1) Gross Floor Area: 80,856 ft² ☐ Yes ☐ No

Is this the total size, as measured between the outside surface of the exterior walls of the building(s)? This includes all areas inside the building(s) such as: occupied tenant areas, common areas, meeting areas, break rooms, restrooms, elevator shafts, mechanical equipment areas, and storage rooms. Gross Floor Area should not include interstitial plenum space between floors, which may house pipes and ventilation. Gross Floor Area is not the same as rentable, but rather includes all area inside the building(s). Leasable space would be a sub-set of Gross Floor Area. In the case where there is an atrium, you should count the Gross Floor Area at the base level only. Do not increase the size to accommodate open atrium space at higher levels. The Gross Floor Area should not include any exterior spaces such as balconies or exterior loading docks and driveways.

2) High School: No ☐ Yes ☐ No

Is this is the correct answer to whether the property is a high school (teaching grades 10, 11, and/or 12)? If the property teaches to high school students at all, then it is a high school. For example, if the school teaches grades K-12 (elementary/middle and high school), then it is considered a high school.

3) Number of Workers on Main Shift: 40 ☐ Yes ☐ No

Is this the number of workers present during the main shift? Note that this is not a total count of workers, but rather a count of workers who are present at the same time. For example, if there are two daily eight hour shifts of 100 workers each, the Number of Workers on Main Shift value is 100. Number of Workers on Main Shift may include employees of the property, sub-contractors who are onsite regularly, and volunteers who perform regular onsite tasks. Number of Workers should not include visitors to the buildings such as clients, customers, or patients.

4) Student Seating Capacity: 419 ☐ Yes ☐ No

Is this the maximum number of students for which the school was designed? This should include the seating capacity of the entire school. If portable classrooms have been added to the school, include the capacity of these classrooms, as they expand the overall capacity of the school.

5) Months in Use: 9 ☐ Yes ☐ No

Is this the total number of months that the property is open for standard activities?

6) Weekend Operation: No ☐ Yes ☐ No

Is this the correct answer to whether the property includes regular activities on the weekend beyond the scope of maintenance, cleaning, and security personnel? Weekend activity includes any time when the property is used for classes, performances, or other school or community activities, on one or both days of the weekend during one or more seasons of the year.

7) Number of Computers: 141.5 ← default ☐ **Yes** ☐ **No**

Is this the total number of desktop computers, laptops, and data servers at the property? This number should not include tablet computers, such as iPads, or any other types of office equipment. The count should only reflect computers that are owned by the school. It should not include any computers that are brought onsite by students or staff.

★ **8) Cooking Facilities:** 100% Yes ☐ **Yes** ☐ **No**

Is this the correct answer to whether the property has a commercial cooking area designed to provide and serve food to occupants and/or visitors? Commercial kitchens include restaurants and cafeterias, but not employee break room kitchens.

9) Gross Floor Area Used for Food Preparation: 0 ft^2 ← default ☐ **Yes** ☐ **No**

Is this the correct Gross Floor Area Used for Food Preparation? It is defined as the total size of all large/commercial kitchen areas used for the storage and preparation of food. It is a subset of the property Gross Floor Area. It should not include small kitchens, employee break rooms/pantries, concession stands, or service and seating areas.

10) Number of Walk-in Refrigeration/Freezer Units: 1 ☐ **Yes** ☐ **No**

Is this the total count of walk-in units at the property? The Number of Walk-in Refrigeration/Freezer Units is the total count of walk-in units at the property. Walk-in Refrigeration/Freezers are large enough for a person to actually walk into. They may or may not have a door, plastic strips, or other flexible covers.

★ **11) Percent That Can Be Heated:** 100 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be heated by mechanical equipment?

★ **12) Percent That Can Be Cooled:** 80 ☐ **Yes** ☐ **No**

Is this the total percentage of the property that can be cooled by mechanical equipment? This includes all types of cooling from central air to individual window units.

13) Gymnasium Floor Area: 0 ft^2 ← default ☐ **Yes** ☐ **No**

Is this the correct floor area for the gymnasium, including gymnasium/athletic areas, spectator areas, locker rooms, and other associated spaces?

14) School District: Barnegat Twp ☐ **Yes** ☐ **No**

Is this the administrative school district in which the property is located?

Notes:

3. Review of Energy Consumption

Data Overview

Site Energy Use Summary		**National Median Comparison**	
Electric - Solar (kBtu)	171,241.1 (4%)	National Median Site EUI (kBtu/ft²)	44.2
Electric - Grid (kBtu)	2,395,048.5 (62%)	National Median Source EUI (kBtu/ft²)	94.6
Natural Gas (kBtu)	1,271,712.3 (33%)	% Diff from National Median Source EUI	7.3%
Total Energy (kBtu)	3,838,001.9		

Energy Intensity		**Emissions (based on site energy use)**	
Site (kBtu/ft²)	47.5	Greenhouse Gas Emissions (Metric Tons CO2e)	310.2
Source (kBtu/ft²)	101.6		

Power Generation Plant or Distribution Utility:
Atlantic City Electric Co

Note: All values are annualized to a 12-month period. Source Energy includes energy used in generation and transmission to enable an equitable assessment.

Summary of All Associated Energy Meters

The following meters are associated with the property, meaning that they are added together to get the total energy use for the property. Please see additional tables in this checklist for the exact meter consumption values. **Note: please review all meter entries, making note of any unusual entries, and, if they are correct, provide a manual note to explain.**

Meter Name	Fuel Type	Start Date	End Date	Associated With:
Electric Grid Meter	Electric - Grid	01/26/2019	In Use	Robert L. Horbelt Elementary School; Barnegat Township School District
Natural Gas	Natural Gas	01/31/2019	In Use	Robert L. Horbelt Elementary School; Barnegat Township School District
Electric Solar Meter	Electric - Solar	02/21/2019	In Use	Robert L. Horbelt Elementary School; Barnegat Township School District

Total Energy Use ☐ **Yes** ☐ **No**

Do the meters shown above account for the total energy use of this property during the reporting period of this application?

Additional Fuels ☐ **Yes** ☐ **No**

Do the meters above include all fuel types at the property? That is, no additional fuels such as district steam, generator fuel oil have been excluded.

On-Site Solar and Wind Energy ☐ **Yes** ☐ **No**

Are all on-site solar and wind installations reported in this list (if present)? All on-site systems must be reported.

Notes:

Electric - Grid Meter: Electric Grid Meter (kWh (thousand Watt-hours))

Associated With: Robert L. Horbelt Elementary School; Barnegat Township School District

Start Date	End Date	Usage	Green Power?
01/26/2019	02/26/2019	66,236	No
02/27/2019	03/27/2019	54,408	No
03/28/2019	04/25/2019	43,777	No
04/26/2019	05/28/2019	57,442	No
05/29/2019	06/26/2019	68,530	No
06/27/2019	07/26/2019	67,075	No
07/27/2019	08/27/2019	64,660	No
08/28/2019	09/25/2019	65,440	No
09/26/2019	10/28/2019	62,872	No
10/29/2019	11/25/2019	48,277	No
11/26/2019	12/26/2019	50,427 ← estimate	No
12/27/2019	01/24/2020	52,577	No
01/25/2020	02/25/2020	57,814	No
		Total Consumption (kWh (thousand Watt-hours)):	759,535
		Total Consumption (kBtu (thousand Btu)):	2,591,533.4

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Natural Gas Meter: Natural Gas (therms)

Associated With: Robert L. Horbelt Elementary School; Barnegat Township School District

Start Date	End Date	Usage
01/31/2019	03/05/2019	2,507 ← estimate
03/05/2019	04/03/2019	1,952
04/03/2019	05/07/2019	484.93
05/07/2019	06/06/2019	115
06/06/2019	07/08/2019	69.2
07/08/2019	08/06/2019	46.4
08/06/2019	08/30/2019	35.7
08/30/2019	09/28/2019	76.8
09/28/2019	11/04/2019	350.5
11/04/2019	12/03/2019	1,852.1
12/03/2019	01/06/2020	2,850.8
01/06/2020	01/30/2020	2,296
01/30/2020	03/02/2020	2,506.6
	Total Consumption (therms):	15,143.03
	Total Consumption (kBtu (thousand Btu)):	1,514,303

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

Electric - Solar Meter: Electric Solar Meter (kWh (thousand Watt-hours))

Associated With: Robert L. Horbelt Elementary School; Barnegat Township School District

Start Date	End Date	Energy Used Onsite	Energy Exported Offsite	REC Ownership
02/21/2019	03/22/2019	4,621.2 ← estimate	0	Owned
03/23/2019	04/22/2019	5,316 ← estimate	0	Owned
04/23/2019	05/22/2019	6,021.6 ← estimate	0	Owned
05/23/2019	06/20/2019	5,807 ← estimate	0	Owned
06/21/2019	07/22/2019	6,038.16 ← estimate	0	Owned
07/23/2019	08/21/2019	5,434.9 ← estimate	0	Owned
08/22/2019	09/20/2019	4,575.82 ← estimate	0	Owned
09/21/2019	10/23/2019	3,637.6 ← estimate	0	Owned
10/24/2019	11/21/2019	2,811.55 ← estimate	0	Owned
11/22/2019	12/20/2019	2,258.95 ← estimate	0	Owned
12/21/2019	01/21/2020	2,619.3 ← estimate	0	Owned
01/22/2020	02/22/2020	3,346.65 ← estimate	0	Owned
		Total Consumption (kWh (thousand Watt-hours)):		52,488.73
		Total Consumption (kBtu (thousand Btu)):		179,091.5

Total Energy Consumption for this Meter ☐ **Yes** ☐ **No**

Do the fuel consumption totals shown above include consumption of all energy tracked through this meter that affect energy calculations for the reporting period of this application (i.e., do the entries match the utility bills received by the property)?

Notes:

4. Signature & Stamp of Verifying Licensed Professional

____________________ (Name) visited this site on ___________ (Date). Based on the conditions observed at the time of the visit to this property, I verify that the information contained within this application is accurate and in accordance with the Licensed Professional Guide.

Signature ________________________

Date _________

Licensed Professional

____ ________
,
(____)____-______
____

NOTE: When applying for the ENERGY STAR, the signature of the Verifying Professional must match the stamp.

Professional Engineering Stamp

(if applicable)

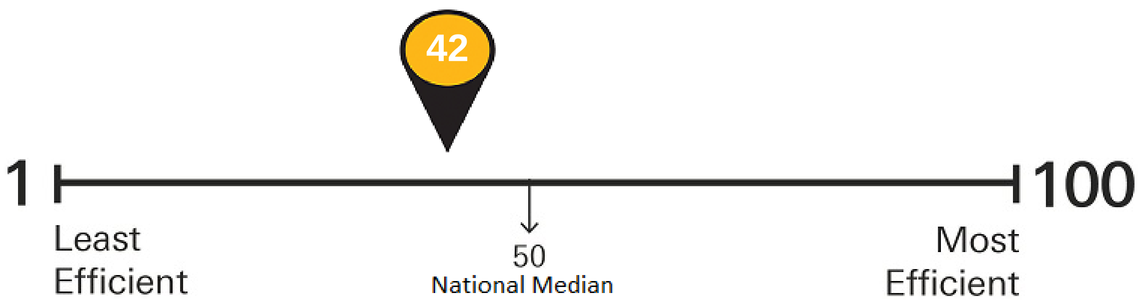
ENERGY STAR® Energy Performance Scorecard

42

out of 100

Robert L. Horbelt Elementary School

For Year Ending	January 31, 2020
Property Address	104 Burr Street Barnegat, New Jersey 08005
Primary Function	K-12 School
Gross Floor Area (ft²)	80,856
Year built	2001
Energy Use per sq. ft.*	47.5 kBtu



What is the ENERGY STAR Score?
The ENERGY STAR score rates commercial building's energy performance relative to similar buildings nationwide. Expressed as a number on a simple 1-100 scale, the score rates performance on a percentile basis: a building with a score of 50 performs better than 50% of its peers. Higher scores mean better energy efficiency, resulting in less energy use and fewer greenhouse gas emissions. If a 1-100 score for a specific building type has not been developed, Site Energy Use Intensity (EUI) will be displayed on this scorecard.

Learn more at:
energystar.gov/scorecard

*Site energy use

EPA United States Environmental Protection Agency

Date Generated: May 22, 2020

ENERGY STAR® Statement of Energy Performance

42

ENERGY STAR® Score[1]

Robert L. Horbelt Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 80,856
Built: 2001

For Year Ending: January 31, 2020
Date Generated: May 22, 2020

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Robert L. Horbelt Elementary School 104 Burr Street Barnegat, New Jersey 08005	________________ , (____)____-______	____ ________ , (____)____-______ ________________

Property ID: 10497416

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
47.5 kBtu/ft²

Source EUI
101.6 kBtu/ft²

Annual Energy by Fuel

Electric - Solar (kBtu)	171,241 (4%)
Electric - Grid (kBtu)	2,395,048 (62%)
Natural Gas (kBtu)	1,271,712 (33%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	44.2
National Median Source EUI (kBtu/ft²)	94.6
% Diff from National Median Source EUI	7%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	310

Signature & Stamp of Verifying Professional

I _________________ (Name) verify that the above information is true and correct to the best of my knowledge.

LP Signature: ______________________Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer or Registered Architect Stamp
(if applicable)

Appendix F: GreenTech Proposal

Customer: Barnegat Township School District

					EXISTING LIGHTING USAGE		ENERGY SAVINGS										ENVIRONMENTAL IMPACT		
Building Name	Program Cost	Utility Rebate	Payback Period	Internal Rate Of Return	KW Usage	Lighting KWH Usage	KW Saved	KWH Saved (Lighting)	KWH Saved (Controls)	KWH Saved	KWH Savings (Lighting)	KWH Savings (Controls)	KWH Savings	Energy Savings	Operation Savings	Total Savings	Reduction in Carbon Dioxide (pounds)	Reduction in Sulfur Dioxide (grams)	Reduction in Nitrogen Oxide (grams)
Barnegat High School	$437,499	$78,944	9.3	11%	160	384,484	84	221,463	0	221,463	$31,005	$0	$31,005	$31,005	$7,417	$38,422	332,194	1,240,192	553,657
Russell O Brackman Middle School	$297,393	$50,979	7.6	13%	118	294,133	66	178,191	11,402	189,593	$24,947	$1,596	$26,543	$26,543	$6,072	$32,615	284,390	1,061,721	473,983
Robert L Horbelt School	$177,116	$27,212	7.7	13%	79	174,622	47	112,898	1,183	114,081	$15,806	$166	$15,971	$15,971	$3,481	$19,452	171,122	638,855	285,203
Joseph T Donahue Elementary School	$202,047	$36,301	8.4	12%	76	187,445	40	111,013	298	111,311	$15,542	$42	$15,584	$15,584	$4,103	$19,686	166,967	623,343	278,278
Administration Building	$8,393	$1,740	5.5	18%	4	10,472	3	6,474	731	7,204	$906	$102	$1,009	$1,009	$195	$1,203	10,807	40,345	18,011
Transportation / Buildings & Grounds	$29,421	$5,876	7.0	14%	14	29,300	8	19,478	497	19,976	$2,727	$70	$2,797	$2,797	$554	$3,351	29,963	111,863	49,939
Totals	$1,151,869	$201,052	8.3	12%	451	1,080,458	248	649,516	14,112	663,628	$90,932	$1,976	$92,908	$92,908	$21,821	$114,729	995,443	3,716,319	1,659,071

M & V 50 Points	$3,847
3% Contingency	$34,261
Total	$1,189,977
Bond	$17,850
Grand Total	$1,207,827

Program Options Summary

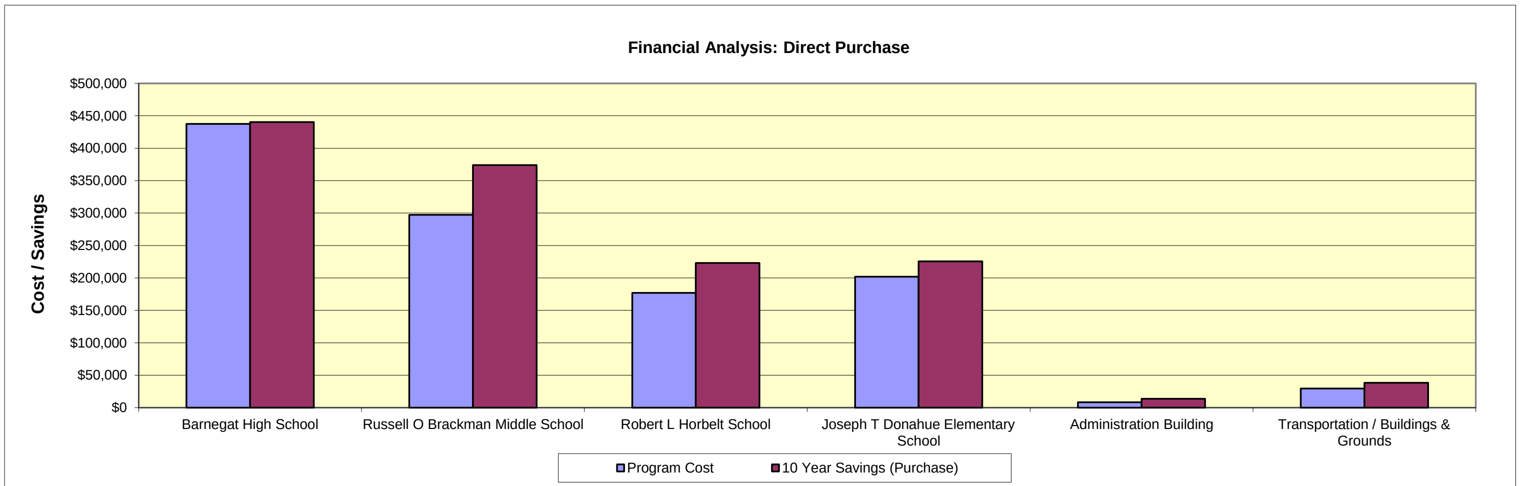
High School Auditorium	$110,393	$1,940	16.3	6%	30	73,220	27	66,646	0	66,646	$6,665	$0	$6,665	$6,665	$0	$6,665	99,970	373,220	166,616
Middle School Auditorium	$109,588	$2,450	31.2	3%	17	42,388	14	34,355	0	34,355	$3,436	$0	$3,436	$3,436	$0	$3,436	51,533	192,388	85,888

PLEASE NOTE:

We can expect the appraised value of the property to increase by $1147000 using the Net Operating Income appraisal method at a 10% capitalization rate.

Rebate amounts are estimated and are subject to change without notice.

Sales Tax is not included in this proposal as we consider this project a asset improvement project. Please consult your accountant for further review.



CUSTOMER: Barnegat Township School Dist
LOCATION:
City, State, Zip Code:

GreenTecl
LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
1	Barnegat High School	Main Entry	3,860	6	COMPACT FLUORESCENT 23W HW	23	533	0.14	6	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	278	0.07	255	255	0.07
2	Barnegat High School	Main Lobby - Large Salad Bov	3,860	3	EXISTING DECORATIVE FIXTURES	0			3	NO CHANGE	0				0	0.00
3	Barnegat High School	Main Lobby - Small Salad Bov	3,860	4	EXISTING DECORATIVE FIXTURES	0			4	NO CHANGE	0				0	0.00
4	Barnegat High School	Main Lobby	3,860	44	COMPACT FLUORESCENT 23W HW	23	3,906	1.01	44	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	2,038	0.53	1,868	1,868	0.48
5	Barnegat High School	Main Lobby	3,860	5	COMPACT FLUORESCENT 23W HW	23	444	0.12	5	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	232	0.06	212	212	0.06
6	Barnegat High School	Main Office	1,800	21	3L 4' F25 T8 ELE H BALLAST	83	3,119	1.73	21	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	1,191	0.66	1,928	1,928	1.07
7	Barnegat High School	Main Office	1,800	2	COMPACT FLUORESCENT 23W HW	23	83	0.05	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	43	0.02	40	40	0.02
8	Barnegat High School	Conference Room	1,800	6	3L 4' F25 T8 ELE H BALLAST	83	891	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	340	0.19	551	551	0.31
9	Barnegat High School	Assistant Principal	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
10	Barnegat High School	Assistant Principal	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
11	Barnegat High School	Work Room	1,800	3	3L 4' F25 T8 ELE H BALLAST	83	446	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	170	0.09	275	275	0.15
12	Barnegat High School	Principal	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
13	Barnegat High School	Bathroom	2,000	1	2L 2' F17 ELE N BALLAST	34	68	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	28	0.01	40	40	0.02
14	Barnegat High School	Office #6	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
15	Barnegat High School	Attend. Office	1,800	1	3L 4' F25 T8 ELE H BALLAST	83	149	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	57	0.03	92	92	0.05
16	Barnegat High School	Rogers Office	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
17	Barnegat High School	Office #2	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
18	Barnegat High School	Office #5	1,800	1	3L 4' F25 T8 ELE H BALLAST	83	149	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	57	0.03	92	92	0.05
19	Barnegat High School	Office #3	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
20	Barnegat High School	Office #4	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
21	Barnegat High School	HALLS & BATHROOMS - Nev		0	0	0			0		0				0	0.00
22	Barnegat High School	End Office	1,800	3	3L 4' F25 T8 ELE H BALLAST	83	446	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	170	0.09	275	275	0.15
23	Barnegat High School	Mail Room	2,500	1	3L 4' F25 T8 ELE H BALLAST	83	206	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	79	0.03	128	128	0.05
24	Barnegat High School	Security	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
25	Barnegat High School	Library	2,500	85	3L 4' F25 T8 ELE H BALLAST	83	17,531	7.01	85	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	6,694	2.68	10,838	10,838	4.34
26	Barnegat High School	Library	2,500	8	COMPACT FLUORESCENT 23W HW	23	460	0.18	8	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	240	0.10	220	220	0.09
27	Barnegat High School	Library	2,500	11	COMPACT FLUORESCENT 23W HW	23	633	0.25	11	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	330	0.13	303	303	0.12
28	Barnegat High School	Library	2,500	6	3L 4' F25 T8 ELE H BALLAST	83	1,238	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	473	0.19	765	765	0.31
29	Barnegat High School	Side Entry	3,860	2	COMPACT FLUORESCENT 23W HW	23	178	0.05	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	93	0.02	85	85	0.02
30	Barnegat High School	Periodicals	800	4	3L 4' F25 T8 ELE H BALLAST	83	264	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	101	0.13	163	163	0.20
31	Barnegat High School	Data Room	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
32	Barnegat High School	Library 1 / Computers	1,500	9	3L 4' F25 T8 ELE H BALLAST	83	1,114	0.74	9	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	425	0.28	689	689	0.46
33	Barnegat High School	Concession	800	2	3L 4' F25 T8 ELE H BALLAST	83	132	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	50	0.06	82	82	0.10
34	Barnegat High School	Library 2	1,500	17	2L 4' F25 T8 ELE H BALLAST	55	1,403	0.94	17	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	536	0.36	867	867	0.58
35	Barnegat High School	Library Workroom	1,800	3	3L 4' F25 T8 ELE H BALLAST	83	446	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	170	0.09	275	275	0.15
36	Barnegat High School	Library 3	1,500	13	3L 4' F25 T8 ELE H BALLAST	83	1,609	1.07	13	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	614	0.41	995	995	0.66
37	Barnegat High School	Trophy Cases	3,860	9	1L 3' F25 ELE N BALLAST	23	799	0.21	9	RETROFIT 3' 1L LED TUBE / SELF BALLAST	10	347	0.09	452	452	0.12
38	Barnegat High School	Gym Lobby	3,860	74	COMPACT FLUORESCENT 23W HW	23	6,570	1.70	74	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	3,428	0.89	3,142	3,142	0.81
39	Barnegat High School	Gym Lobby - Salad Bowl Fixtu	3,860	4	EXISTING DECORATIVE FIXTURES	0			4	NO CHANGE	0				0	0.00
40	Barnegat High School	Main Gym	3,000	60	EXISTING 2x4 4L T5	234	42,120	14.04	60	RETROFIT 4' 4L T5 LED TUBE / SELF BALLA	100	18,000	6.00	24,120	24,120	8.04
41	Barnegat High School	Weight Room	3,000	20	3L 4' F25 T8 ELE H BALLAST	83	4,950	1.65	20	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	1,890	0.63	3,060	3,060	1.02
42	Barnegat High School	Trainers Room	2,500	7	3L 4' F25 T8 ELE H BALLAST	83	1,444	0.58	7	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	551	0.22	893	893	0.36
43	Barnegat High School	Trainers Room	2,500	1	2L 2' F17 ELE N BALLAST	34	85	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	35	0.01	50	50	0.02
44	Barnegat High School	Gym Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
45	Barnegat High School	Mechanical Room	1,500	6	2L 4' F25 T8 ELE H BALLAST	55	495	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.13	306	306	0.20
46	Barnegat High School	Storage Room	800	1	3L 4' F25 T8 ELE H BALLAST	83	66	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	25	0.03	41	41	0.05
47	Barnegat High School	Storage Room	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
48	Barnegat High School	Stage - N/A		0	0	0			0		0				0	0.00
49	Barnegat High School	Mechanical Room M3	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
50	Barnegat High School	Mechanical Room M2	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
51	Barnegat High School	Boys Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
52	Barnegat High School	Boys Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
53	Barnegat High School	Boys Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
54	Barnegat High School	Girls Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
55	Barnegat High School	Girls Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
56	Barnegat High School	Girls Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
57	Barnegat High School	E101 Entry	3,860	2	COMPACT FLUORESCENT 23W HW	23	178	0.05	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	93	0.02	85	85	0.02
58	Barnegat High School	E101 - New LED		0	0	0			0		0				0	0.00
59	Barnegat High School	E103 - New LED		0	0	0			0		0				0	0.00
60	Barnegat High School	E103 Side Rooms	800	3	3L 4' F25 T8 ELE H BALLAST	83	198	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	76	0.09	122	122	0.15
61	Barnegat High School	E105 Class	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
62	Barnegat High School	E105 Class	1,500	5	500 WATT INCAN QUARTZ	500	3,750	2.50	5	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	236	0.16	3,514	3,514	2.34
63	Barnegat High School	Storage S7	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
64	Barnegat High School	Nurse Office	1,800	9	3L 4' F25 T8 ELE H BALLAST	83	1,337	0.74	9	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	510	0.28	826	826	0.46
65	Barnegat High School	Lockers Lobby	3,860	4	COMPACT FLUORESCENT 23W HW	23	355	0.09	4	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	185	0.05	170	170	0.04
66	Barnegat High School	Boys Lockers	3,000	19	3L 4' F25 T8 ELE H BALLAST	83	4,703	1.57	19	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	1,796	0.60	2,907	2,907	0.97
67	Barnegat High School	Boys Lockers	3,000	1	COMPACT FLUORESCENT 23W HW	23	69	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	36	0.01	33	33	0.01
68	Barnegat High School	Boys Lockers	3,000	2	2L 4' F25 T8 ELE H BALLAST	55	330	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.04	204	204	0.07
69	Barnegat High School	Boys Lockers	3,000	4	2L 3' F25 ELE N BALLAST	45	540	0.18	4	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	240	0.08	300	300	0.10
70	Barnegat High School	Coaches Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
71	Barnegat High School	Coaches Office	2,500	3	COMPACT FLUORESCENT 23W HW	23	173	0.07	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	90	0.04	83	83	0.03
72	Barnegat High School	Gym Side Hall	3,860	4	3L 4' F25 T8 ELE H BALLAST	83	1,274	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	486	0.13	787	787	0.20
73	Barnegat High School	Girls Lockers	3,000	1	COMPACT FLUORESCENT 23W HW	23	69	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	36	0.01	33	33	0.01
74	Barnegat High School	Girls Lockers	3,000	2	2L 4' F25 T8 ELE H BALLAST	55	330	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.04	204	204	0.07
75	Barnegat High School	Girls Lockers	3,000	4	2L 3' F25 ELE N BALLAST	45	540	0.18	4	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	240	0.08	300	300	0.10
76	Barnegat High School	Girls Lockers	3,000	2	3L 4' F25 T8 ELE H BALLAST	83	495	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	189	0.06	306	306	0.10
77	Barnegat High School	Girls Lockers	3,000	3	COMPACT FLUORESCENT 23W HW	23	207	0.07	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	108	0.04	99	99	0.03
78	Barnegat High School	Wrestling	3,000	20	EXISTING 2x4 4L T5	234	14,040	4.68	20	RETROFIT 4' 4L T5 LED TUBE / SELF BALLA	100	6,000	2.00	8,040	8,040	2.68
79	Barnegat High School	Wrestling	3,000	2	COMPACT FLUORESCENT 23W HW	23	138	0.05	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	72	0.02	66	66	0.02
80	Barnegat High School	S6 Storage	800	6	2L 4' F25 T8 ELE H BALLAST	55	264	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	101	0.13	163	163	0.20
81	Barnegat High School	Athletics	1,800	6	3L 4' F25 T8 ELE H BALLAST	83	891	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	340	0.19	551	551	0.31
82	Barnegat High School	Guidance Entry	1,800	1	COMPACT FLUORESCENT 23W HW	23	41	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	22	0.01	20	20	0.01
83	Barnegat High School	Guidance Conference Room	1,800	4	3L 4' F25 T8 ELE H BALLAST	83	594	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	227	0.13	367	367	0.20
84	Barnegat High School	Janitor JCJ	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
85	Barnegat High School	Hall Bathroom	2,000	1	2L 2' F17 ELE N BALLAST	34	68	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	28	0.01	40	40	0.02
86	Barnegat High School	Faculty Dining	1,800	21	2L 4' F25 T8 ELE H BALLAST	55	2,079	1.16	21	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	794	0.44	1,285	1,285	0.71
87	Barnegat High School	Upper Mechanical Room	1,500	22	2L 4' F25 T8 ELE H BALLAST	55	1,815	1.21	22	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	693	0.46	1,122	1,122	0.75
88	Barnegat High School	Upper Mech. Room - Emer Ba	1,500	0	0	0			4	EMERGENCY BALLAST LED	0				0	0.00
89	Barnegat High School	Data Room 3	800	1	2L 4' F25 T8 ELE H BALLAST	55	44	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.02	27	27	0.03
90	Barnegat High School	Electrical Room	1,500	4	2L 4' F25 T8 ELE H BALLAST	55	330	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.08	204	204	0.14
91	Barnegat High School	Gym #2	3,000	24	EXISTING 2x4 4L T5	234	16,848	5.62	24	RETROFIT 4' 4L T5 LED TUBE / SELF BALLA	100	7,200	2.40	9,648	9,648	3.22
92	Barnegat High School	Gym Storage	800	12	2L 4' F25 T8 ELE H BALLAST	55	528	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	202	0.25	326	326	0.41
93	Barnegat High School	(2) Hall Bathrooms	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
94	Barnegat High School	(2) Hall Bathrooms	2,000	4	2L 3' F25 ELE N BALLAST	45	360	0.18	4	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	160	0.08	200	200	0.10

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
95	Barnegat High School	(2) Hall Bathrooms	2,000	4	2L 2' F17 ELE N BALLAST	34	272	0.14	4	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	112	0.06	160	160	0.08
96	Barnegat High School	Cafeteria Entry	3,860	6	COMPACT FLUORESCENT 23W HW	23	533	0.14	6	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	278	0.07	255	255	0.07
97	Barnegat High School	S4 Storage	800	2	3L 4' F25 T8 ELE H BALLAST	83	132	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	50	0.06	82	82	0.10
98	Barnegat High School	Student Store	800	3	3L 4' F25 T8 ELE H BALLAST	83	198	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	76	0.09	122	122	0.15
99	Barnegat High School	JC6 Closet	400	2	2L 4' F25 T8 ELE H BALLAST	55	44	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.04	27	27	0.07
100	Barnegat High School	Kitchen Serving	1,800	12	3L 4' F25 T8 ELE H BALLAST	83	1,782	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	680	0.38	1,102	1,102	0.61
101	Barnegat High School	Kitchen Serving	1,800	6	65 WATT INCAN FLOOD	65	702	0.39	6	RELAMP 9 WATT LED A LAMP S/I	9	97	0.05	605	605	0.34
102	Barnegat High School	Kitchen	2,000	15	3L 4' F25 T8 ELE H BALLAST	83	2,475	1.24	15	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	945	0.47	1,530	1,530	0.77
103	Barnegat High School	Stove Hoods	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
104	Barnegat High School	Lockers / Bathroom	2,000	2	3L 4' F25 T8 ELE H BALLAST	83	330	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	126	0.06	204	204	0.10
105	Barnegat High School	Mop Room	400	1	3L 4' F25 T8 ELE H BALLAST	83	33	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	13	0.03	20	20	0.05
106	Barnegat High School	Coolers	800	6	2 LAMP 4 FT F40 T12 EE / EE	73	350	0.44	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	101	0.13	250	250	0.31
107	Barnegat High School	Coolers	800	2	60 WATT INCANDESCENT	60	96	0.12	2	RELAMP 9 WATT LED A LAMP S/I	9	14	0.02	82	82	0.10
108	Barnegat High School	Facilities	2,500	8	3L 4' F25 T8 ELE H BALLAST	83	1,650	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	630	0.25	1,020	1,020	0.41
109	Barnegat High School	West Stairs	3,860	7	2L 4' F25 T8 ELE H BALLAST	55	1,486	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.15	919	919	0.24
110	Barnegat High School	West Stairs	3,860	0	0	0			7	EMERGENCY BALLAST LED	0				0	0.00
111	Barnegat High School	West Stairs	3,860	1	3L 4' F25 T8 ELE H BALLAST	83	318	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	122	0.03	197	197	0.05
112	Barnegat High School	Class B213	1,500	15	3L 4' F25 T8 ELE H BALLAST	83	1,856	1.24	15	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	709	0.47	1,148	1,148	0.77
113	Barnegat High School	Prep B211A	1,500	2	3L 4' F25 T8 ELE H BALLAST	83	248	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	95	0.06	153	153	0.10
114	Barnegat High School	Class B212	1,500	15	3L 4' F25 T8 ELE H BALLAST	83	1,856	1.24	15	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	709	0.47	1,148	1,148	0.77
115	Barnegat High School	Prep B210A	1,500	2	3L 4' F25 T8 ELE H BALLAST	83	248	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	95	0.06	153	153	0.10
116	Barnegat High School	Class B210	1,500	15	3L 4' F25 T8 ELE H BALLAST	83	1,856	1.24	15	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	709	0.47	1,148	1,148	0.77
117	Barnegat High School	Class B211	1,500	15	3L 4' F25 T8 ELE H BALLAST	83	1,856	1.24	15	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	709	0.47	1,148	1,148	0.77
118	Barnegat High School	Class B208	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
119	Barnegat High School	Class B206	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
120	Barnegat High School	Class B209	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
121	Barnegat High School	Class B207	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
122	Barnegat High School	Class B204	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
123	Barnegat High School	Class B203	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
124	Barnegat High School	Class B205	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
125	Barnegat High School	Mens Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
126	Barnegat High School	Mens Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
127	Barnegat High School	Mens Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
128	Barnegat High School	JC4 Closet	400	1	2L 2' F17 ELE N BALLAST	34	14	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	6	0.01	8	8	0.02
129	Barnegat High School	Faculty Bathroom	2,000	1	2L 2' F17 ELE N BALLAST	34	68	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	28	0.01	40	40	0.02
130	Barnegat High School	Girls Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
131	Barnegat High School	Girls Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
132	Barnegat High School	Girls Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
133	Barnegat High School	Hall Storage	800	3	2L 4' F25 T8 ELE H BALLAST	55	132	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	50	0.06	82	82	0.10
134	Barnegat High School	Elevator	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
135	Barnegat High School	Class B202	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
136	Barnegat High School	Class B201	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
137	Barnegat High School	Class C210	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
138	Barnegat High School	Stairs	3,860	7	2L 4' F25 T8 ELE H BALLAST	55	1,486	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.15	919	919	0.24
139	Barnegat High School	Stairs	3,860	0	0	0			7	EMERGENCY BALLAST LED	0				0	0.00
140	Barnegat High School	Stairs	3,860	2	COMPACT FLUORESCENT 23W HW	23	178	0.05	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	93	0.02	85	85	0.02
141	Barnegat High School	Girls Room	2,000	5	2L 4' F25 T8 ELE H BALLAST	55	550	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	210	0.11	340	340	0.17

CUSTOMER: Barnegat Township School Dist
LOCATION:
City, State, Zip Code:

GreenTecl
LIGHTING

LOCATION:			EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
142	Barnegat High School	Girls Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
143	Barnegat High School	Girls Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
144	Barnegat High School	Class C209A	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
145	Barnegat High School	Faculty Bathroom	2,000	1	2L 2' F17 ELE N BALLAST	34	68	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	28	0.01	40	40	0.02
146	Barnegat High School	Janitor Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
147	Barnegat High School	Boys Room	2,000	5	2L 4' F25 T8 ELE H BALLAST	55	550	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	210	0.11	340	340	0.17
148	Barnegat High School	Boys Room	2,000	1	2L 2' F17 ELE N BALLAST	34	68	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	28	0.01	40	40	0.02
149	Barnegat High School	Boys Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
150	Barnegat High School	Mechanical M5	1,500	8	2L 4' F25 T8 ELE H BALLAST	55	660	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.17	408	408	0.27
151	Barnegat High School	Class C209	1,500	8	3L 4' F25 T8 ELE H BALLAST	83	990	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	378	0.25	612	612	0.41
152	Barnegat High School	S17 Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
153	Barnegat High School	Class C208	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
154	Barnegat High School	Class C207	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
155	Barnegat High School	Class C205	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
156	Barnegat High School	Class C206	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
157	Barnegat High School	Class C203	1,500	2	3L 4' F25 T8 ELE H BALLAST	83	248	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	95	0.06	153	153	0.10
158	Barnegat High School	Class C204	1,500	14	3L 4' F25 T8 ELE H BALLAST	83	1,733	1.16	14	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	662	0.44	1,071	1,071	0.71
159	Barnegat High School	Prep Room	1,500	3	3L 4' F25 T8 ELE H BALLAST	83	371	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	142	0.09	230	230	0.15
160	Barnegat High School	Class C202	1,500	14	3L 4' F25 T8 ELE H BALLAST	83	1,733	1.16	14	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	662	0.44	1,071	1,071	0.71
161	Barnegat High School	S16 Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
162	Barnegat High School	Stairs #4	3,860	7	2L 4' F25 T8 ELE H BALLAST	55	1,486	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.15	919	919	0.24
163	Barnegat High School	Stairs #4	3,860	0	0	0			7	EMERGENCY BALLAST LED	0				0	0.00
164	Barnegat High School	Stairs #4	3,860	2	COMPACT FLUORESCENT 23W HW	23	178	0.05	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	93	0.02	85	85	0.02
165	Barnegat High School	Class C201	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
166	Barnegat High School	Girls Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
167	Barnegat High School	Girls Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
168	Barnegat High School	Girls Room	2,000	1	COMPACT FLUORESCENT 23W HW	23			0	RETROFIT HIGH HAT 12 WATT LED 6 INCH	0				0	0.00
169	Barnegat High School	Faculty Bathroom	2,000	1	2L 2' F17 ELE N BALLAST	34	68	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	28	0.01	40	40	0.02
170	Barnegat High School	Boys Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
171	Barnegat High School	Boys Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
172	Barnegat High School	Boys Room	2,000	1	COMPACT FLUORESCENT 23W HW	23			0	RETROFIT HIGH HAT 12 WATT LED 6 INCH	0				0	0.00
173	Barnegat High School	South Stairs	3,860	7	2L 4' F25 T8 ELE H BALLAST	55	1,486	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.15	919	919	0.24
174	Barnegat High School	South Stairs	3,860	0	0	0			7	EMERGENCY BALLAST LED	0				0	0.00
175	Barnegat High School	South Stairs	3,860	2	COMPACT FLUORESCENT 23W HW	23	178	0.05	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	93	0.02	85	85	0.02
176	Barnegat High School	Class A204	1,500	6	3L 4' F25 T8 ELE H BALLAST	83	743	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	284	0.19	459	459	0.31
177	Barnegat High School	S11 Storage	800	2	3L 4' F25 T8 ELE H BALLAST	83	132	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	50	0.06	82	82	0.10
178	Barnegat High School	Class A200	1,500	6	3L 4' F25 T8 ELE H BALLAST	83	743	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	284	0.19	459	459	0.31
179	Barnegat High School	Class A202	1,500	4	3L 4' F25 T8 ELE H BALLAST	83	495	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	189	0.13	306	306	0.20
180	Barnegat High School	Class A201	1,500	10	3L 4' F25 T8 ELE H BALLAST	83	1,238	0.83	10	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	473	0.32	765	765	0.51
181	Barnegat High School	Class A203	1,500	8	3L 4' F25 T8 ELE H BALLAST	83	990	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	378	0.25	612	612	0.41
182	Barnegat High School	Class A205	1,500	8	3L 4' F25 T8 ELE H BALLAST	83	990	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	378	0.25	612	612	0.41
183	Barnegat High School	Class A205A	1,500	8	3L 4' F25 T8 ELE H BALLAST	83	990	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	378	0.25	612	612	0.41
184	Barnegat High School	Class A207	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
185	Barnegat High School	Class A209	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
186	Barnegat High School	Class A208	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
187	Barnegat High School	S-15 Storage	800	3	2L 4' F25 T8 ELE H BALLAST	55	132	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	50	0.06	82	82	0.10
188	Barnegat High School	Class A210	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61

	LOCATION:		EXISTING							PROPOSED				SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
189	Barnegat High School	Class A212	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
190	Barnegat High School	Class A211	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
191	Barnegat High School	Class A213	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
192	Barnegat High School	EC2 Electrical	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
193	Barnegat High School	Data Room	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
194	Barnegat High School	Class A214	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
195	Barnegat High School	North Stairs	3,860	7	2L 4' F25 T8 ELE H BALLAST	55	1,486	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.15	919	919	0.24
196	Barnegat High School	North Stairs	3,860	0	0	0			7	EMERGENCY BALLAST LED	0				0	0.00
197	Barnegat High School	2nd Floor Hallways	3,860	46	COMPACT FLUORESCENT 23W HW	23	4,084	1.06	46	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	2,131	0.55	1,953	1,953	0.51
198	Barnegat High School	2nd Floor Hallways - Large Sa	3,860	2	EXISTING DECORATIVE FIXTURES	0			2	NO CHANGE	0				0	0.00
199	Barnegat High School	1ST FLOOR CONTINUED		0	0	0			0		0				0	0.00
200	Barnegat High School	Class B110	1,500	34	2L 4' F25 T8 ELE H BALLAST	55	2,805	1.87	34	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,071	0.71	1,734	1,734	1.16
201	Barnegat High School	B108A	1,500	2	3L 4' F25 T8 ELE H BALLAST	83	248	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	95	0.06	153	153	0.10
202	Barnegat High School	Class B108	1,500	34	2L 4' F25 T8 ELE H BALLAST	55	2,805	1.87	34	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,071	0.71	1,734	1,734	1.16
203	Barnegat High School	Class B106	1,500	20	3L 4' F25 T8 ELE H BALLAST	83	2,475	1.65	20	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	945	0.63	1,530	1,530	1.02
204	Barnegat High School	B106 Office	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
205	Barnegat High School	B106 Studio	1,800	4	3L 4' F25 T8 ELE H BALLAST	83	594	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	227	0.13	367	367	0.20
206	Barnegat High School	Class B104	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
207	Barnegat High School	Hallway Recessed Cans	3,860	41	COMPACT FLUORESCENT 23W HW	23	3,640	0.94	41	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	1,899	0.49	1,741	1,741	0.45
208	Barnegat High School	Mens Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
209	Barnegat High School	Mens Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
210	Barnegat High School	Mens Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
211	Barnegat High School	JC2 Closet	400	1	2L 2' F17 ELE N BALLAST	34	14	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	6	0.01	8	8	0.02
212	Barnegat High School	Ladies Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
213	Barnegat High School	Ladies Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
214	Barnegat High School	Ladies Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
215	Barnegat High School	Faculty Room	2,500	3	COMPACT FLUORESCENT 23W HW	23	173	0.07	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	90	0.04	83	83	0.03
216	Barnegat High School	Elevator Room	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
217	Barnegat High School	Electrical Room	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
218	Barnegat High School	Data Room #4	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
219	Barnegat High School	Class A110	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
220	Barnegat High School	S12 Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
221	Barnegat High School	Ladies Room	2,000	3	3L 4' F25 T8 ELE H BALLAST	83	495	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	189	0.09	306	306	0.15
222	Barnegat High School	Ladies Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
223	Barnegat High School	Ladies Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
224	Barnegat High School	Ladies Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	3	RETROFIT 3' 3L LED TUBE / SELF BALLAST	30	180	0.09	(134)	(134)	(0.07)
225	Barnegat High School	Faculty Bathroom	2,000	1	2L 2' F17 ELE N BALLAST	34	68	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	28	0.01	40	40	0.02
226	Barnegat High School	Janitor	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
227	Barnegat High School	Boys Room	2,000	3	3L 4' F25 T8 ELE H BALLAST	83	495	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	189	0.09	306	306	0.15
228	Barnegat High School	Boys Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
229	Barnegat High School	Boys Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
230	Barnegat High School	Boys Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
231	Barnegat High School	S3 Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
232	Barnegat High School	Class A101 Storage	800	2	3L 4' F25 T8 ELE H BALLAST	83	132	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	50	0.06	82	82	0.10
233	Barnegat High School	Kiln Room	800	2	3L 4' F25 T8 ELE H BALLAST	83	132	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	50	0.06	82	82	0.10
234	Barnegat High School	A102 Storage	800	2	3L 4' F25 T8 ELE H BALLAST	83	132	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	50	0.06	82	82	0.10
235	Barnegat High School	A102 Display	800	2	1L 3' F25 ELE N BALLAST	23	37	0.05	2	RETROFIT 3' 1L LED TUBE / SELF BALLAST	10	16	0.02	21	21	0.03

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LOCATION:

City, State, Zip Code:

GreenTecl
LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
236	Barnegat High School	Data Closet	800	1	3L 4' F25 T8 ELE H BALLAST	83	66	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	25	0.03	41	41	0.05
237	Barnegat High School	Class C110	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
238	Barnegat High School	Class C109A	1,500	8	3L 4' F25 T8 ELE H BALLAST	83	990	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	378	0.25	612	612	0.41
239	Barnegat High School	Girls Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
240	Barnegat High School	Girls Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
241	Barnegat High School	Girls Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
242	Barnegat High School	Faculty Bathroom	2,000	1	2L 2' F17 ELE N BALLAST	34	68	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	28	0.01	40	40	0.02
243	Barnegat High School	Janitor	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
244	Barnegat High School	Boys Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
245	Barnegat High School	Boys Room	2,000	2	2L 3' F25 ELE N BALLAST	45	180	0.09	2	RETROFIT 3' 2L LED TUBE / SELF BALLAST	20	80	0.04	100	100	0.05
246	Barnegat High School	Boys Room	2,000	3	2L 4' F25 T8 ELE H BALLAST	55	330	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.06	204	204	0.10
247	Barnegat High School	Boys Room	2,000	1	COMPACT FLUORESCENT 23W HW	23	46	0.02	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	24	0.01	22	22	0.01
248	Barnegat High School	Class C109	1,500	8	3L 4' F25 T8 ELE H BALLAST	83	990	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	378	0.25	612	612	0.41
249	Barnegat High School	Mechanical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
250	Barnegat High School	Hall Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
251	Barnegat High School	Class C108	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
252	Barnegat High School	Class C107	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
253	Barnegat High School	Class C105	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
254	Barnegat High School	Class C106	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
255	Barnegat High School	Class C103	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
256	Barnegat High School	Class C104	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
257	Barnegat High School	Prep Room	1,500	3	3L 4' F25 T8 ELE H BALLAST	83	371	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	142	0.09	230	230	0.15
258	Barnegat High School	Class C102	1,500	14	3L 4' F25 T8 ELE H BALLAST	83	1,733	1.16	14	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	662	0.44	1,071	1,071	0.71
259	Barnegat High School	Class C101	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
260	Barnegat High School	Hallways	3,860	57	COMPACT FLUORESCENT 23W HW	23	5,060	1.31	57	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	2,640	0.68	2,420	2,420	0.63
261	Barnegat High School	Hallways - Large Salad Bowls	3,860	2	EXISTING DECORATIVE FIXTURES	0			2	NO CHANGE	0				0	0.00
262	Barnegat High School	Football Building	3,000	25	3L 4' F25 T8 ELE H BALLAST	83	6,188	2.06	25	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	2,363	0.79	3,825	3,825	1.28
263	Barnegat High School	Football Building	3,000	6	4L 4' F25 T8 ELE H BALLAST	110	1,980	0.66	6	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	756	0.25	1,224	1,224	0.41
264	Barnegat High School	Bathroom	3,860	2	4L 4' F25 T8 ELE H BALLAST	110	849	0.22	2	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	324	0.08	525	525	0.14
265	Barnegat High School	Bathroom	3,860	2	4L 4' F25 T8 ELE H BALLAST	110	849	0.22	2	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	324	0.08	525	525	0.14
266	Barnegat High School	Office	2,500	2	4L 4' F25 T8 ELE H BALLAST	110	550	0.22	2	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	210	0.08	340	340	0.14
267	Barnegat High School	Mop Closet	400	1	COMPACT FLUORESCENT 13W S/I	13	5	0.01	1	RELAMP 9 WATT LED A LAMP S/I	9	4	0.01	2	2	0.00
268	Barnegat High School	Hallway Emergency Ballast	3,860	0	0	0			50	EMERGENCY BALLAST LED	0				0	0.00
269	Barnegat High School	Exterior Lighting		0	0	0			0		0				0	0.00
270	Barnegat High School	Main Canopies	4,380	6	COMPACT FLUORESCENT 23W HW	23	604	0.14	6	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	315	0.07	289	289	0.00
271	Barnegat High School	Main Canopies	4,380	6	COMPACT FLUORESCENT 23W HW	23	604	0.14	6	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	315	0.07	289	289	0.00
272	Barnegat High School	Main Canopies	4,380	8	COMPACT FLUORESCENT 23W HW	23	806	0.18	8	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	420	0.10	385	385	0.00
273	Barnegat High School	Full Face Wall Packs	4,380	29	70 WATT INDUCTION WALLPACK	70	8,891	2.03	29	NEW LED WALL PACK 20 WATT	20	2,540	0.58	6,351	6,351	0.00
274	Barnegat High School	Wall Mount Floods	4,380	18	70 WATT INDUCTION FLOOD	70	5,519	1.26	18	NEW LED FLOOD 52 WATT	52	4,100	0.94	1,419	1,419	0.00
275	Barnegat High School	PL Wall Packs	4,380	8	COMPACT FLUORESCENT 13W HW	13	456	0.10	8	NEW LED WALL PACK 20 WATT	20	701	0.16	(245)	(245)	0.00
276	Barnegat High School	Cutoff Wall Packs	4,380	23	COMPACT FLUORESCENT 23W HW (2)	46	4,634	1.06	23	NEW LED WALL PACK 20 WATT	20	2,015	0.46	2,619	2,619	0.00
277	Barnegat High School	Shoe Box Pole Lights	4,380	79	200 WATT INDUCTION SHOEBOX	200	69,204	15.80	79	NEW LED SHOEBOX LOT 100 WATT ARM	100	34,602	7.90	34,602	34,602	0.00
278	Barnegat High School	(13) LED Wall Packs		0	0	0			0		0				0	0.00
279	Barnegat High School	FOOTBALL BUILDING EXTER		0	0	0			0		0				0	0.00
280	Barnegat High School	Wall Mount Floods	4,380	2	70 WATT MH FLOOD	92	806	0.18	2	NEW LED FLOOD 14 WATT	14	123	0.03	683	683	0.00
281	Barnegat High School	Cutoff Wall Packs	4,380	1	70 WATT MH WALLPACK	92	403	0.09	1	NEW LED WALL PACK 20 WATT	20	88	0.02	315	315	0.00
282	Barnegat High School	#1 Courtyard Wall Packs	4,380	4	70 WATT INDUCTION WALLPACK	70	1,226	0.28	4	NEW LED WALL PACK 20 WATT	20	350	0.08	876	876	0.00

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GreenTecl
LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
283	Barnegat High School	#2 Courtyard Wall Packs	4,380	6	70 WATT INDUCTION WALLPACK	70	1,840	0.42	6	NEW LED WALL PACK 20 WATT	20	526	0.12	1,314	1,314	0.00
284	Barnegat High School	#2 Courtyard Wall Packs	4,380	2	COMPACT FLUORESCENT 23W HW (2)	46	403	0.09	2	NEW LED WALL PACK 20 WATT	20	175	0.04	228	228	0.00
285	Barnegat High School								1	3% Spares	0				0	0.00
286	Barnegat High School								17	High Reach Labor	0				0	0.00
	Total: Barnegat High School			**2,055**			**384,484**	**159.78**	**2,162**			**163,021**	**64.71**	**221,463**	**221,463**	**83.85**

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LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
1	Russell O Brackman Middle School	Main Entry	3,860	2	COMPACT FLUORESCENT 13W HW (3)	39	301	0.08	2	NEW LED CANOPY 21 WATT	21	162	0.04	139	139	0.04
2	Russell O Brackman Middle School	Main Entry	3,860	4	COMPACT FLUORESCENT 23W HW	23	355	0.09	4	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	185	0.05	170	170	0.04
3	Russell O Brackman Middle School	Lobby Area	3,860	8	COMPACT FLUORESCENT 23W HW	23	710	0.18	8	RETROFIT HIGH HAT 12 WATT LED 4 INCH	12	371	0.10	340	340	0.09
4	Russell O Brackman Middle School	Lobby Area	3,860	1	COMPACT FLUORESCENT 13W HW (3)	39	151	0.04	1	NEW LED CANOPY 21 WATT	21	81	0.02	69	69	0.02
5	Russell O Brackman Middle School	Lobby Area - Salad Bowl	3,860	1	EXISTING DECORATIVE FIXTURES	0			1	NO CHANGE	0				0	0.00
6	Russell O Brackman Middle School	Display Cases	3,860	6	1L 3' F25 ELE N BALLAST	23	533	0.14	6	RETROFIT 3' 1L LED TUBE / SELF BALLAST	10	232	0.06	301	301	0.08
7	Russell O Brackman Middle School	Main Office	2,500	4	3L 4' F25 T8 ELE H BALLAST	83	825	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	315	0.13	510	510	0.20
8	Russell O Brackman Middle School	Main Office	2,500	8	COMPACT FLUORESCENT 13W HW	13	260	0.10	8	RETROFIT HIGH HAT 12 WATT LED 4 INCH	12	240	0.10	20	20	0.01
9	Russell O Brackman Middle School	Mail Room	2,500	3	3L 4' F25 T8 ELE H BALLAST	83	619	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	236	0.09	383	383	0.15
10	Russell O Brackman Middle School	Mail Room	2,500	1	3L 4' F25 T8 ELE H BALLAST	83	206	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	79	0.03	128	128	0.05
11	Russell O Brackman Middle School	Principals Office	2,500	3	3L 4' F25 T8 ELE H BALLAST	83	619	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	236	0.09	383	383	0.15
12	Russell O Brackman Middle School	Hall/Pantry	2,500	1	3L 4' F25 T8 ELE H BALLAST	83	206	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	79	0.03	128	128	0.05
13	Russell O Brackman Middle School	Hall/Pantry	2,500	4	COMPACT FLUORESCENT 23W HW	23	230	0.09	4	RETROFIT HIGH HAT 12 WATT LED 4 INCH	12	120	0.05	110	110	0.04
14	Russell O Brackman Middle School	Bathroom	3,860	1	2L 4' F25 T8 ELE H BALLAST	55	212	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	81	0.02	131	131	0.03
15	Russell O Brackman Middle School	Asst. Principal	2,500	4	3L 4' F25 T8 ELE H BALLAST	83	825	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	315	0.13	510	510	0.20
16	Russell O Brackman Middle School	Asst. Principal	2,500	4	3L 4' F25 T8 ELE H BALLAST	83	825	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	315	0.13	510	510	0.20
17	Russell O Brackman Middle School	Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
18	Russell O Brackman Middle School	File Room	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
19	Russell O Brackman Middle School	Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
20	Russell O Brackman Middle School	Conference Room	2,500	4	3L 4' F25 T8 ELE H BALLAST	83	825	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	315	0.13	510	510	0.20
21	Russell O Brackman Middle School	Stair #1	3,860	5	2L 4' F25 T8 ELE H BALLAST	55	1,062	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	405	0.11	656	656	0.17
22	Russell O Brackman Middle School	Stair #1 - New LED		0	0	0			0		0				0	0.00
23	Russell O Brackman Middle School	2ND FLOOR WEST		0	0	0			0		0				0	0.00
24	Russell O Brackman Middle School	Storage Room	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
25	Russell O Brackman Middle School	Boys	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
26	Russell O Brackman Middle School	Boys	3,860	1	COMPACT FLUORESCENT 23W HW	23	89	0.02	1	RETROFIT HIGH HAT 12 WATT LED 4 INCH	12	46	0.01	42	42	0.01
27	Russell O Brackman Middle School	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
28	Russell O Brackman Middle School	Girls Room	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
29	Russell O Brackman Middle School	Girls Room	3,860	1	COMPACT FLUORESCENT 23W HW	23	89	0.02	1	RETROFIT HIGH HAT 12 WATT LED 4 INCH	12	46	0.01	42	42	0.01
30	Russell O Brackman Middle School	Class W201	1,500	18	2L 4' F25 T8 ELE H BALLAST	55	1,485	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.38	918	918	0.61
31	Russell O Brackman Middle School	Prep Room	2,200	9	2L 4' F25 T8 ELE H BALLAST	55	1,089	0.50	9	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	416	0.19	673	673	0.31
32	Russell O Brackman Middle School	Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
33	Russell O Brackman Middle School	Class W203	1,500	21	2L 4' F25 T8 ELE H BALLAST	55	1,733	1.16	21	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	662	0.44	1,071	1,071	0.71
34	Russell O Brackman Middle School	Class W200	1,500	6	2L 4' F25 T8 ELE H BALLAST	55	495	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.13	306	306	0.20
35	Russell O Brackman Middle School	Class W202	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
36	Russell O Brackman Middle School	Class W204	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
37	Russell O Brackman Middle School	Class W205	1,500	20	2L 4' F25 T8 ELE H BALLAST	55	1,650	1.10	20	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	630	0.42	1,020	1,020	0.68
38	Russell O Brackman Middle School	Prep Room	1,500	9	2L 4' F25 T8 ELE H BALLAST	55	743	0.50	9	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	284	0.19	459	459	0.31
39	Russell O Brackman Middle School	Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
40	Russell O Brackman Middle School	Class W207	1,500	18	2L 4' F25 T8 ELE H BALLAST	55	1,485	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.38	918	918	0.61
41	Russell O Brackman Middle School	Class W206	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
42	Russell O Brackman Middle School	Class W208	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
43	Russell O Brackman Middle School	Stairs 2	3,860	7	2L 4' F25 T8 ELE H BALLAST	55	1,486	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.15	919	919	0.24
44	Russell O Brackman Middle School	Electrical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
45	Russell O Brackman Middle School	Class N209	1,500	6	2L 4' F25 T8 ELE H BALLAST	55	495	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.13	306	306	0.20
46	Russell O Brackman Middle School	Hall Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
47	Russell O Brackman Middle School	Class N210	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
48	Russell O Brackman Middle School	Girls Room	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
49	Russell O Brackman Middle School	Girls Room	3,860	2	2L 2' F17 ELE N BALLAST	34	262	0.07	2	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	108	0.03	154	154	0.04
50	Russell O Brackman Middle School	Boys Room	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
51	Russell O Brackman Middle School	Boys Room	3,860	2	2L 2' F17 ELE N BALLAST	34	262	0.07	2	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	108	0.03	154	154	0.04
52	Russell O Brackman Middle School	Storage/Elec.	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07

CUSTOMER: **Barnegat Township School Dist**

LOCATION:

City, State, Zip Code:

GreenTecl
LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
53	Russell O Brackman Middle School	Class N212	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
54	Russell O Brackman Middle School	Class N211	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
55	Russell O Brackman Middle School	N314/N214	2,200	16	2L 4' F25 T8 ELE H BALLAST	55	1,936	0.88	16	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	739	0.34	1,197	1,197	0.54
56	Russell O Brackman Middle School	Class N213	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
57	Russell O Brackman Middle School	Class N216	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
58	Russell O Brackman Middle School	Class N215	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
59	Russell O Brackman Middle School	Class N218	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
60	Russell O Brackman Middle School	Class N217	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
61	Russell O Brackman Middle School	Faculty Room N220	2,500	6	2L 4' F25 T8 ELE H BALLAST	55	825	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	315	0.13	510	510	0.20
62	Russell O Brackman Middle School	Faculty Room N220	2,500	1	2L 2' F17 ELE N BALLAST	34	85	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	35	0.01	50	50	0.02
63	Russell O Brackman Middle School	Class 219	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
64	Russell O Brackman Middle School	Custodian Closet	400	3	2L 4' F25 T8 ELE H BALLAST	55	66	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	25	0.06	41	41	0.10
65	Russell O Brackman Middle School	Class N221	2,200	18	2L 4' F25 T8 ELE H BALLAST	55	2,178	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	832	0.38	1,346	1,346	0.61
66	Russell O Brackman Middle School	N221 Storage	800	1	2L 4' F25 T8 ELE H BALLAST	55	44	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.02	27	27	0.03
67	Russell O Brackman Middle School	Class N222	2,200	20	2L 4' F25 T8 ELE H BALLAST	55	2,420	1.10	20	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	924	0.42	1,496	1,496	0.68
68	Russell O Brackman Middle School	N222 Prep	2,200	4	2L 4' F25 T8 ELE H BALLAST	55	484	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	185	0.08	299	299	0.14
69	Russell O Brackman Middle School	Electrical Room	1,500	3	2L 4' F25 T8 ELE H BALLAST	55	248	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	95	0.06	153	153	0.10
70	Russell O Brackman Middle School	Hall Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
71	Russell O Brackman Middle School	Center Stairs	3,860	6	2L 4' F25 T8 ELE H BALLAST	55	1,274	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	486	0.13	787	787	0.20
72	Russell O Brackman Middle School	Center Stairs	3,860	1	3L 4' F25 T8 ELE H BALLAST	83	318	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	122	0.03	197	197	0.05
73	Russell O Brackman Middle School	Class S223	2,200	18	2L 4' F25 T8 ELE H BALLAST	55	2,178	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	832	0.38	1,346	1,346	0.61
74	Russell O Brackman Middle School	S223 Kiln	800	1	3L 4' F25 T8 ELE H BALLAST	83	66	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	25	0.03	41	41	0.05
75	Russell O Brackman Middle School	Class S225	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
76	Russell O Brackman Middle School	Class S224	2,200	20	2L 4' F25 T8 ELE H BALLAST	55	2,420	1.10	20	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	924	0.42	1,496	1,496	0.68
77	Russell O Brackman Middle School	S224 Prep	2,200	4	2L 4' F25 T8 ELE H BALLAST	55	484	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	185	0.08	299	299	0.14
78	Russell O Brackman Middle School	Class S227	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
79	Russell O Brackman Middle School	Class S226	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
80	Russell O Brackman Middle School	Class S229	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
81	Russell O Brackman Middle School	Class S228	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
82	Russell O Brackman Middle School	Class S231A	2,200	5	2L 4' F25 T8 ELE H BALLAST	55	605	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	231	0.11	374	374	0.17
83	Russell O Brackman Middle School	HALLS - SOME 3RD LAMP	3,860	3	3L 4' F25 T8 ELE H BALLAST	83	955	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	365	0.09	591	591	0.15
84	Russell O Brackman Middle School	Class 231B	2,200	8	2L 4' F25 T8 ELE H BALLAST	55	968	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	370	0.17	598	598	0.27
85	Russell O Brackman Middle School	Class S230	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
86	Russell O Brackman Middle School	Class S233	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
87	Russell O Brackman Middle School	Class S232	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
88	Russell O Brackman Middle School	Electrical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
89	Russell O Brackman Middle School	Boys Room	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
90	Russell O Brackman Middle School	Boys Room	3,860	2	2L 2' F17 ELE N BALLAST	34	262	0.07	2	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	108	0.03	154	154	0.04
91	Russell O Brackman Middle School	Girls Room	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
92	Russell O Brackman Middle School	Girls Room	3,860	2	2L 2' F17 ELE N BALLAST	34	262	0.07	2	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	108	0.03	154	154	0.04
93	Russell O Brackman Middle School	Class S234	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
94	Russell O Brackman Middle School	Hall Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
95	Russell O Brackman Middle School	Class S235	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
96	Russell O Brackman Middle School	Hallways	3,860	48	2L 4' F25 T8 ELE H BALLAST	55	10,190	2.64	48	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	3,891	1.01	6,300	6,300	1.63
97	Russell O Brackman Middle School	Hallways	3,860	16	3L 4' F25 T8 ELE H BALLAST	83	5,095	1.32	16	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	1,945	0.50	3,150	3,150	0.82
98	Russell O Brackman Middle School	1ST FLOOR		0	0	0			0		0				0	0.00
99	Russell O Brackman Middle School	Main Hallways	3,860	8	3L 4' F25 T8 ELE H BALLAST	83	2,548	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	973	0.25	1,575	1,575	0.41
100	Russell O Brackman Middle School	Main Hallways	3,860	49	2L 4' F25 T8 ELE H BALLAST	55	10,403	2.70	49	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	3,972	1.03	6,431	6,431	1.67
101	Russell O Brackman Middle School	Main Hallways	3,860	16	3L 4' F25 T8 ELE H BALLAST	83	5,095	1.32	16	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	1,945	0.50	3,150	3,150	0.82
102	Russell O Brackman Middle School	Library	2,500	51	2L 4' F25 T8 ELE H BALLAST	55	7,013	2.81	51	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	2,678	1.07	4,335	4,335	1.73
103	Russell O Brackman Middle School	Library	2,500	5	2L 2' F17 ELE N BALLAST	34	425	0.17	5	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	175	0.07	250	250	0.10
104	Russell O Brackman Middle School	Displays	2,500	2	2L 4' F25 T8 ELE H BALLAST	55	275	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	105	0.04	170	170	0.07
105	Russell O Brackman Middle School	Library Work Room	2,500	6	2L 4' F25 T8 ELE H BALLAST	55	825	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	315	0.13	510	510	0.20

CUSTOMER: **Barnegat Township School Dist**
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LIGHTING

	LOCATION:		EXISTING							PROPOSED				SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
106	Russell O Brackman Middle School	Office	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
107	Russell O Brackman Middle School	Elevator Room	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
108	Russell O Brackman Middle School	Room C127	1,500	5	2L 4' F25 T8 ELE H BALLAST	55	413	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.11	255	255	0.17
109	Russell O Brackman Middle School	Guidance	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
110	Russell O Brackman Middle School	Services	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
111	Russell O Brackman Middle School	Office #1	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
112	Russell O Brackman Middle School	Office #2	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
113	Russell O Brackman Middle School	Office #3	2,500	4	2L 4' F25 T8 ELE H BALLAST	55	550	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	210	0.08	340	340	0.14
114	Russell O Brackman Middle School	Nurse Suite	2,500	11	2L 4' F25 T8 ELE H BALLAST	55	1,513	0.61	11	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	578	0.23	935	935	0.37
115	Russell O Brackman Middle School	Nurse Suite	2,500	6	2L 2' F17 ELE N BALLAST	34	510	0.20	6	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	210	0.08	300	300	0.12
116	Russell O Brackman Middle School	Class C123	2,200	16	4L 4' F25 T8 ELE H BALLAST	110	3,872	1.76	16	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	1,478	0.67	2,394	2,394	1.09
117	Russell O Brackman Middle School	Elevator	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
118	Russell O Brackman Middle School	Ladies Room	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
119	Russell O Brackman Middle School	Ladies Room	3,860	1	2L 2' F17 ELE N BALLAST	34	131	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	54	0.01	77	77	0.02
120	Russell O Brackman Middle School	Class E145	2,200	16	4L 4' F25 T8 ELE H BALLAST	110	3,872	1.76	16	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	1,478	0.67	2,394	2,394	1.09
121	Russell O Brackman Middle School	Boys Room	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
122	Russell O Brackman Middle School	Class E146	1,500	16	2L 4' F25 T8 ELE H BALLAST	55	1,320	0.88	16	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	504	0.34	816	816	0.54
123	Russell O Brackman Middle School	E146 Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
124	Russell O Brackman Middle School	E146 Office	2,500	1	4L 4' F25 T8 ELE H BALLAST	110	275	0.11	1	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	105	0.04	170	170	0.07
125	Russell O Brackman Middle School	E146 Office	2,500	1	2L 4' F25 T8 ELE H BALLAST	55	138	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	53	0.02	85	85	0.03
126	Russell O Brackman Middle School	E146 Office	2,500	1	60 WATT INCANDESCENT	60	150	0.06	1	RELAMP 9 WATT LED A LAMP S/I	9	23	0.01	128	128	0.05
127	Russell O Brackman Middle School	Display	3,860	1	2L 4' F25 T8 ELE H BALLAST	55	212	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	81	0.02	131	131	0.03
128	Russell O Brackman Middle School	Music E147	1,500	14	2L 4' F25 T8 ELE H BALLAST	55	1,155	0.77	14	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	441	0.29	714	714	0.48
129	Russell O Brackman Middle School	E147 Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
130	Russell O Brackman Middle School	Sound Booth	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
131	Russell O Brackman Middle School	Room E148	1,500	6	3L 4' F25 T8 ELE H BALLAST	83	743	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	284	0.19	459	459	0.31
132	Russell O Brackman Middle School	(2) Bathrooms	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
133	Russell O Brackman Middle School	Class E148	2,200	8	3L 4' F25 T8 ELE H BALLAST	83	1,452	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	554	0.25	898	898	0.41
134	Russell O Brackman Middle School	Class E149	2,200	8	3L 4' F25 T8 ELE H BALLAST	83	1,452	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	554	0.25	898	898	0.41
135	Russell O Brackman Middle School	Class E150	2,200	8	3L 4' F25 T8 ELE H BALLAST	83	1,452	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	554	0.25	898	898	0.41
136	Russell O Brackman Middle School	Class E151	2,200	2	3L 4' F25 T8 ELE H BALLAST	83	363	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	139	0.06	224	224	0.10
137	Russell O Brackman Middle School	Class E152	2,200	5	3L 4' F25 T8 ELE H BALLAST	83	908	0.41	5	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	347	0.16	561	561	0.26
138	Russell O Brackman Middle School	Facilities	2,500	22	2L 4' F25 T8 ELE H BALLAST	55	3,025	1.21	22	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,155	0.46	1,870	1,870	0.75
139	Russell O Brackman Middle School	Electrical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
140	Russell O Brackman Middle School	High Voltage	1,500	4	2L 4' F25 T8 ELE H BALLAST	55	330	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.08	204	204	0.14
141	Russell O Brackman Middle School	Boiler Room	1,500	6	2L 4' F25 T8 ELE H BALLAST	55	495	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.13	306	306	0.20
142	Russell O Brackman Middle School	Mens Room	3,860	1	3L 4' F25 T8 ELE H BALLAST	83	318	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	122	0.03	197	197	0.05
143	Russell O Brackman Middle School	Mens Room	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
144	Russell O Brackman Middle School	Custodian Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
145	Russell O Brackman Middle School	Main Gym Entries	3,860	6	2L 4' F25 T8 ELE H BALLAST	55	1,274	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	486	0.13	787	787	0.20
146	Russell O Brackman Middle School	Storage - New LED		0	0	0			0		0				0	0.00
147	Russell O Brackman Middle School	Main Gym	3,000	24	EXISTING 2x4 4L T5	234	16,848	5.62	24	RETROFIT 4' 4L T5 LED TUBE / SELF BALLA	100	7,200	2.40	9,648	9,648	3.22
148	Russell O Brackman Middle School	Main Gym	3,000	4	EXISTING 1x4 2L T5	117	1,404	0.47	4	RETROFIT 4' 2L T5 LED TUBE / SELF BALLA	50	600	0.20	804	804	0.27
149	Russell O Brackman Middle School	Boys Lockers	3,000	14	2L 4' F25 T8 ELE H BALLAST	55	2,310	0.77	14	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	882	0.29	1,428	1,428	0.48
150	Russell O Brackman Middle School	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
151	Russell O Brackman Middle School	Showers	3,000	3	2L 4' F25 T8 ELE H BALLAST	55	495	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.06	306	306	0.10
152	Russell O Brackman Middle School	Office	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
153	Russell O Brackman Middle School	Office	2,500	2	60 WATT INCANDESCENT	60	300	0.12	2	RELAMP 9 WATT LED A LAMP S/I	9	45	0.02	255	255	0.10
154	Russell O Brackman Middle School	Girls Lockers	3,000	14	2L 4' F25 T8 ELE H BALLAST	55	2,310	0.77	14	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	882	0.29	1,428	1,428	0.48
155	Russell O Brackman Middle School	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
156	Russell O Brackman Middle School	Shower	3,000	4	2L 4' F25 T8 ELE H BALLAST	55	660	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.08	408	408	0.14
157	Russell O Brackman Middle School	Office	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
158	Russell O Brackman Middle School	Office	2,500	2	60 WATT INCANDESCENT	60	300	0.12	2	RELAMP 9 WATT LED A LAMP S/I	9	45	0.02	255	255	0.10

LOCATION:			EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
159	Russell O Brackman Middle School	Storage Room	800	7	2L 4' F25 T8 ELE H BALLAST	55	308	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	118	0.15	190	190	0.24
160	Russell O Brackman Middle School	Loft	800	6	2L 4' F25 T8 ELE H BALLAST	55	264	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	101	0.13	163	163	0.20
161	Russell O Brackman Middle School	Band G154	1,500	36	2L 4' F25 T8 ELE H BALLAST	55	2,970	1.98	36	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,134	0.76	1,836	1,836	1.22
162	Russell O Brackman Middle School	Girls Room	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
163	Russell O Brackman Middle School	Girls Room	3,860	1	3L 4' F25 T8 ELE H BALLAST	83	318	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	122	0.03	197	197	0.05
164	Russell O Brackman Middle School	Weight Room	3,000	24	2L 4' F25 T8 ELE H BALLAST	55	3,960	1.32	24	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,512	0.50	2,448	2,448	0.82
165	Russell O Brackman Middle School	Weight Room	3,000	2	2L 2' F17 ELE N BALLAST	34	204	0.07	2	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	84	0.03	120	120	0.04
166	Russell O Brackman Middle School	Side Room	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
167	Russell O Brackman Middle School	Display	3,860	1	2L 4' F25 T8 ELE H BALLAST	55	212	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	81	0.02	131	131	0.03
168	Russell O Brackman Middle School	Kitchen	2,000	22	2L 4' F25 T8 ELE H BALLAST	55	2,420	1.21	22	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	924	0.46	1,496	1,496	0.75
169	Russell O Brackman Middle School	Kitchen	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
170	Russell O Brackman Middle School	Stove Hoods	2,000	4	60 WATT INCANDESCENT	60	480	0.24	4	RELAMP 9 WATT LED A LAMP S/I	9	72	0.04	408	408	0.20
171	Russell O Brackman Middle School	Office	2,500	2	2L 4' F25 T8 ELE H BALLAST	55	275	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	105	0.04	170	170	0.07
172	Russell O Brackman Middle School	Dry Storage	800	3	2L 4' F25 T8 ELE H BALLAST	55	132	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	50	0.06	82	82	0.10
173	Russell O Brackman Middle School	Coolers	800	4	60 WATT INCANDESCENT	60	192	0.24	4	RELAMP 9 WATT LED A LAMP S/I	9	29	0.04	163	163	0.20
174	Russell O Brackman Middle School	Bathroom	3,860	1	2L 4' F25 T8 ELE H BALLAST	55	212	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	81	0.02	131	131	0.03
175	Russell O Brackman Middle School	Cafeteria	2,500	50	2L 4' F25 T8 ELE H BALLAST	55	6,875	2.75	50	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	2,625	1.05	4,250	4,250	1.70
176	Russell O Brackman Middle School	Gym #2 - New LED		0	0	0			0		0				0	0.00
177	Russell O Brackman Middle School	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
178	Russell O Brackman Middle School	Gym Storage	800	3	2L 4' F25 T8 ELE H BALLAST	55	132	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	50	0.06	82	82	0.10
179	Russell O Brackman Middle School	Mechanical Room	1,500	6	2L 4' F25 T8 ELE H BALLAST	55	495	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.13	306	306	0.20
180	Russell O Brackman Middle School	M132	2,200	4	2L 4' F25 T8 ELE H BALLAST	55	484	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	185	0.08	299	299	0.14
181	Russell O Brackman Middle School	M131	2,200	4	2L 4' F25 T8 ELE H BALLAST	55	484	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	185	0.08	299	299	0.14
182	Russell O Brackman Middle School	Boys Room	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
183	Russell O Brackman Middle School	Boys Room	3,860	1	2L 2' F17 ELE N BALLAST	34	131	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	54	0.01	77	77	0.02
184	Russell O Brackman Middle School	Room 130/129	2,200	8	2L 4' F25 T8 ELE H BALLAST	55	968	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	370	0.17	598	598	0.27
185	Russell O Brackman Middle School	Girls Room	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
186	Russell O Brackman Middle School	Girls Room	3,860	1	2L 2' F17 ELE N BALLAST	34	131	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	54	0.01	77	77	0.02
187	Russell O Brackman Middle School	Room M128	2,200	2	2L 4' F25 T8 ELE H BALLAST	55	242	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	92	0.04	150	150	0.07
188	Russell O Brackman Middle School	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
189	Russell O Brackman Middle School	Electrical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
190	Russell O Brackman Middle School	Class S134	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
191	Russell O Brackman Middle School	Class S135	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
192	Russell O Brackman Middle School	Class S136	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
193	Russell O Brackman Middle School	Class S137	2,200	22	2L 4' F25 T8 ELE H BALLAST	55	2,662	1.21	22	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,016	0.46	1,646	1,646	0.75
194	Russell O Brackman Middle School	Class S138	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
195	Russell O Brackman Middle School	Class S140	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
196	Russell O Brackman Middle School	Mechanical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
197	Russell O Brackman Middle School	Faculty S142	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
198	Russell O Brackman Middle School	Faculty S142	2,500	3	2L 2' F17 ELE N BALLAST	34	255	0.10	3	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	105	0.04	150	150	0.06
199	Russell O Brackman Middle School	Stairs	3,860	6	3L 4' F25 T8 ELE H BALLAST	83	1,911	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	730	0.19	1,181	1,181	0.31
200	Russell O Brackman Middle School	Stairs	3,860	1	3L 4' F25 T8 ELE H BALLAST	83	318	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	122	0.03	197	197	0.05
201	Russell O Brackman Middle School	Room S141	2,200	6	2L 4' F25 T8 ELE H BALLAST	55	726	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	277	0.13	449	449	0.20
202	Russell O Brackman Middle School	Room S143	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
203	Russell O Brackman Middle School	Room S144	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
204	Russell O Brackman Middle School	NORTH WING		0	0	0			0		0				0	0.00
205	Russell O Brackman Middle School	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
206	Russell O Brackman Middle School	Electrical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
207	Russell O Brackman Middle School	Class N121	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
208	Russell O Brackman Middle School	Class N122	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
209	Russell O Brackman Middle School	Class N119	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
210	Russell O Brackman Middle School	Class N120	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
211	Russell O Brackman Middle School	Class N117	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41

CUSTOMER: Barnegat Township School Dist
LOCATION:
City, State, Zip Code:

GreenTecl
LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
212	Russell O Brackman Middle School	Class N118	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
213	Russell O Brackman Middle School	Class N115	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
214	Russell O Brackman Middle School	Electrical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
215	Russell O Brackman Middle School	Class N113	2,200	4	2L 4' F25 T8 ELE H BALLAST	55	484	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	185	0.08	299	299	0.14
216	Russell O Brackman Middle School	Class N114	2,200	6	2L 4' F25 T8 ELE H BALLAST	55	726	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	277	0.13	449	449	0.20
217	Russell O Brackman Middle School	Class N112	2,200	12	2L 4' F25 T8 ELE H BALLAST	55	1,452	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	554	0.25	898	898	0.41
218	Russell O Brackman Middle School	Stairs	3,860	6	3L 4' F25 T8 ELE H BALLAST	83	1,911	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	730	0.19	1,181	1,181	0.31
219	Russell O Brackman Middle School	Stairs	3,860	1	3L 4' F25 T8 ELE H BALLAST	83	318	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	122	0.03	197	197	0.05
220	Russell O Brackman Middle School	Boys Room	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
221	Russell O Brackman Middle School	Boys Room	3,860	1	COMPACT FLUORESCENT 23W HW	23	89	0.02	1	RETROFIT HIGH HAT 12 WATT LED 4 INCH	12	46	0.01	42	42	0.01
222	Russell O Brackman Middle School	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
223	Russell O Brackman Middle School	Girls Room	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
224	Russell O Brackman Middle School	Girls Room	3,860	1	COMPACT FLUORESCENT 23W HW	23	89	0.02	1	RETROFIT HIGH HAT 12 WATT LED 4 INCH	12	46	0.01	42	42	0.01
225	Russell O Brackman Middle School	Class W101	1,500	18	2L 4' F25 T8 ELE H BALLAST	55	1,485	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.38	918	918	0.61
226	Russell O Brackman Middle School	Prep Room	2,200	6	2L 4' F25 T8 ELE H BALLAST	55	726	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	277	0.13	449	449	0.20
227	Russell O Brackman Middle School	Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
228	Russell O Brackman Middle School	Class W103	1,500	21	2L 4' F25 T8 ELE H BALLAST	55	1,733	1.16	21	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	662	0.44	1,071	1,071	0.71
229	Russell O Brackman Middle School	Book Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
230	Russell O Brackman Middle School	Server Room	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
231	Russell O Brackman Middle School	Class W102	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
232	Russell O Brackman Middle School	Class W104	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
233	Russell O Brackman Middle School	Class W105	1,500	21	2L 4' F25 T8 ELE H BALLAST	55	1,733	1.16	21	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	662	0.44	1,071	1,071	0.71
234	Russell O Brackman Middle School	Prep Room	2,200	6	2L 4' F25 T8 ELE H BALLAST	55	726	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	277	0.13	449	449	0.20
235	Russell O Brackman Middle School	Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
236	Russell O Brackman Middle School	Class W107	1,500	18	2L 4' F25 T8 ELE H BALLAST	55	1,485	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.38	918	918	0.61
237	Russell O Brackman Middle School	Class W106	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
238	Russell O Brackman Middle School	Class W108	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
239	Russell O Brackman Middle School	Class W109	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
240	Russell O Brackman Middle School	Class W110	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
241	Russell O Brackman Middle School	Electrical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
242	Russell O Brackman Middle School	Courtyard	4,380	2	250 WATT MH SHOEBOX	295	2,584	0.59	2	NEW LED SHOEBOX LOT 100 WATT ARM	100	876	0.20	1,708	1,708	0.00
243	Russell O Brackman Middle School	Courtyard	4,380	2	70 WATT HPS WALLPACK	95	832	0.19	2	NEW LED WALL PACK 20 WATT	20	175	0.04	657	657	0.00
244	Russell O Brackman Middle School	N111 Room	2,200	6	2L 4' F25 T8 ELE H BALLAST	55	726	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	277	0.13	449	449	0.20
245	Russell O Brackman Middle School	Auditorium Electrical Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
246	Russell O Brackman Middle School	Side Room	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
247	Russell O Brackman Middle School	Possible Emergency Ballast	3,860	0	0	0			25	EMERGENCY BALLAST LED	0				0	0.00
248	Russell O Brackman Middle School	EXTERIOR		0	0	0			0		0				0	0.00
249	Russell O Brackman Middle School	Shoe Box Pole Lights	4,380	27	200 WATT INDUCTION SHOEBOX	200	23,652	5.40	27	NEW LED SHOEBOX LOT 100 WATT ARM	100	11,826	2.70	11,826	11,826	0.00
250	Russell O Brackman Middle School	Wall Mount Shoe Box Fixtures	4,380	11	200 WATT INDUCTION WALLMOUNT SHOEBOX	200	9,636	2.20	11	NEW LED SHOEBOX LOT 100 WATT ARM	100	4,818	1.10	4,818	4,818	0.00
251	Russell O Brackman Middle School	Front Canopy	4,380	4	COMPACT FLUORESCENT 23W HW	23	403	0.09	4	RETROFIT HIGH HAT 12 WATT LED 4 INCH	12	210	0.05	193	193	0.00
252	Russell O Brackman Middle School	Surf Mount Box Fixture	4,380	5	70 WATT MH WALLPACK	92	2,015	0.46	5	NEW LED CANOPY 21 WATT	21	460	0.11	1,555	1,555	0.00
253	Russell O Brackman Middle School	Half Dome Wall Packs	4,380	11	70 WATT HPS WALLPACK	95	4,577	1.05	11	NEW LED WALL PACK 20 WATT	20	964	0.22	3,614	3,614	0.00
254	Russell O Brackman Middle School	Full Face Wall Packs	4,380	1	70 WATT MH WALLPACK	92	403	0.09	1	NEW LED WALL PACK 20 WATT	20	88	0.02	315	315	0.00
	Total: Russell O Brackman Middle School			**1,872**			**294,133**	**117.59**	**1,962**			**115,943**	**45.76**	**178,191**	**178,191**	**66.20**

CUSTOMER: **Barnegat Township School Dist**
LOCATION:
City, State, Zip Code:

GreenTecl
LIGHTING

LOCATION:			EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
1	Robert L Horbelt School	Main Entry	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
2	Robert L Horbelt School	Main Lobby	3,860	16	COMPACT FLUORESCENT 23W HW (2)	46	2,841	0.74	16	RETROFIT HIGH HAT 12 WATT LED 8 INCH	12	741	0.19	2,100	2,100	0.54
3	Robert L Horbelt School	Main Lobby	3,860	14	COMPACT FLUORESCENT 23W HW (2)	46	2,486	0.64	14	RETROFIT HIGH HAT 12 WATT LED 8 INCH	12	648	0.17	1,837	1,837	0.48
4	Robert L Horbelt School	Class 500	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
5	Robert L Horbelt School	Stage	2,500	12	4L 4' F25 T8 ELE H BALLAST	110	3,300	1.32	12	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	1,260	0.50	2,040	2,040	0.82
6	Robert L Horbelt School	Stage Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
7	Robert L Horbelt School	Boys Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
8	Robert L Horbelt School	Girls Room	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
9	Robert L Horbelt School	Hall Storage	800	3	2L 4' F25 T8 ELE H BALLAST	55	132	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	50	0.06	82	82	0.10
10	Robert L Horbelt School	Main Gym	3,000	24	EXISTING 2x4 3L T5	175	12,600	4.20	24	RETROFIT 4' 3L T5 LED TUBE / SELF BALLA	75	5,400	1.80	7,200	7,200	2.40
11	Robert L Horbelt School	Gym Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
12	Robert L Horbelt School	Storage Room	800	3	2L 4' F25 T8 ELE H BALLAST	55	132	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	50	0.06	82	82	0.10
13	Robert L Horbelt School	Storage Room	800	1	2L 4' F25 T8 ELE H BALLAST	55	44	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.02	27	27	0.03
14	Robert L Horbelt School	Music Room	2,200	3	3L 4' F25 T8 ELE H BALLAST	83	545	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	208	0.09	337	337	0.15
15	Robert L Horbelt School	Music Room	2,200	6	2L 4' F25 T8 ELE H BALLAST	55	726	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	277	0.13	449	449	0.20
16	Robert L Horbelt School	Music Office	2,500	1	3L 4' F25 T8 ELE H BALLAST	83	206	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	79	0.03	128	128	0.05
17	Robert L Horbelt School	Gym Lobby	3,860	15	COMPACT FLUORESCENT 23W HW (2)	46	2,663	0.69	15	RETROFIT HIGH HAT 12 WATT LED 8 INCH	12	695	0.18	1,969	1,969	0.51
18	Robert L Horbelt School	Gym Lobby	3,860	11	2L 4' F25 T8 ELE H BALLAST	55	2,335	0.61	11	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	892	0.23	1,444	1,444	0.37
19	Robert L Horbelt School	Side Entry	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
20	Robert L Horbelt School	Cafeteria	2,500	7	2L 4' F25 T8 ELE H BALLAST	55	963	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	368	0.15	595	595	0.24
21	Robert L Horbelt School	Cafeteria	2,500	36	4L 4' F25 T8 ELE H BALLAST	110	9,900	3.96	36	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	3,780	1.51	6,120	6,120	2.45
22	Robert L Horbelt School	Serving	2,000	6	4L 4' F25 T8 ELE H BALLAST	110	1,320	0.66	6	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	504	0.25	816	816	0.41
23	Robert L Horbelt School	Custodian Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
24	Robert L Horbelt School	Kitchen Bathroom	3,860	1	2L 4' F25 T8 ELE H BALLAST	55	212	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	81	0.02	131	131	0.03
25	Robert L Horbelt School	Kitchen Area	2,000	10	2L 4' F25 T8 ELE H BALLAST	55	1,100	0.55	10	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	420	0.21	680	680	0.34
26	Robert L Horbelt School	Kitchen Area	2,000	3	3L 4' F25 T8 ELE H BALLAST	83	495	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	189	0.09	306	306	0.15
27	Robert L Horbelt School	Kitchen Office	2,500	2	2L 4' F25 T8 ELE H BALLAST	55	275	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	105	0.04	170	170	0.07
28	Robert L Horbelt School	Custodian Office	2,500	5	2L 4' F25 T8 ELE H BALLAST	55	688	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	263	0.11	425	425	0.17
29	Robert L Horbelt School	Mechanical Room	1,500	11	2L 4' F25 T8 ELE H BALLAST	55	908	0.61	11	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	347	0.23	561	561	0.37
30	Robert L Horbelt School	Coolers	800	4	60 WATT INCANDESCENT	60	192	0.24	4	RELAMP 9 WATT LED A LAMP S/I	9	29	0.04	163	163	0.20
31	Robert L Horbelt School	Dry Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
32	Robert L Horbelt School	Stove Hood	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
33	Robert L Horbelt School	Cafeteria Storage	800	5	2L 4' F25 T8 ELE H BALLAST	55	220	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	84	0.11	136	136	0.17
34	Robert L Horbelt School	Main Office	1,800	11	3L 4' F25 T8 ELE H BALLAST	83	1,634	0.91	11	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	624	0.35	1,010	1,010	0.56
35	Robert L Horbelt School	Bathroom	3,860	1	2L 4' F25 T8 ELE H BALLAST	55	212	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	81	0.02	131	131	0.03
36	Robert L Horbelt School	Conference Room	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
37	Robert L Horbelt School	Copier Room	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
38	Robert L Horbelt School	Office #1	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
39	Robert L Horbelt School	Office #2	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
40	Robert L Horbelt School	Storage	800	1	2L 4' F25 T8 ELE H BALLAST	55	44	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.02	27	27	0.03
41	Robert L Horbelt School	Nurse Suite	1,800	8	2L 4' F25 T8 ELE H BALLAST	55	792	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	302	0.17	490	490	0.27
42	Robert L Horbelt School	Nurse Suite	1,800	4	2L 2' F17 ELE N BALLAST	34	245	0.14	4	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	101	0.06	144	144	0.08
43	Robert L Horbelt School	Bathroom	3,860	1	2L 4' F25 T8 ELE H BALLAST	55	212	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	81	0.02	131	131	0.03
44	Robert L Horbelt School	(2) Bathroom	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
45	Robert L Horbelt School	Mechanical Room	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
46	Robert L Horbelt School	Lobby Area	3,860	14	COMPACT FLUORESCENT 23W HW (2)	46	2,486	0.64	14	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	648	0.17	1,837	1,837	0.48
47	Robert L Horbelt School	Faculty Room	1,800	6	3L 4' F25 T8 ELE H BALLAST	83	891	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	340	0.19	551	551	0.31
48	Robert L Horbelt School	Faculty Room	1,800	5	COMPACT FLUORESCENT 23W HW (2)	46	414	0.23	5	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	108	0.06	306	306	0.17
49	Robert L Horbelt School	Elevator	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
50	Robert L Horbelt School	Class 500A	1,500	5	3L 4' F25 T8 ELE H BALLAST	83	619	0.41	5	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	236	0.16	383	383	0.26
51	Robert L Horbelt School	Electrical Closet	1,500	3	2L 4' F25 T8 ELE H BALLAST	55	248	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	95	0.06	153	153	0.10
52	Robert L Horbelt School	Hallway	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
53	Robert L Horbelt School	Hallway	3,860	1	COMPACT FLUORESCENT 23W HW (2)	46	178	0.05	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	46	0.01	131	131	0.03

CUSTOMER: **Barnegat Township School Dist**
LOCATION:
City, State, Zip Code:

GreenTecl
LIGHTING

	LOCATION:		EXISTING							PROPOSED					SAVINGS	
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
54	Robert L Horbelt School	Girls Room	2,000	5	2L 4' F25 T8 ELE H BALLAST	55	550	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	210	0.11	340	340	0.17
55	Robert L Horbelt School	Boys Room	2,000	5	2L 4' F25 T8 ELE H BALLAST	55	550	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	210	0.11	340	340	0.17
56	Robert L Horbelt School	Custodian Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
57	Robert L Horbelt School	Class 500B	1,500	7	3L 4' F25 T8 ELE H BALLAST	83	866	0.58	7	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	331	0.22	536	536	0.36
58	Robert L Horbelt School	Hall Cove	3,860	6	2L 4' F25 T8 ELE H BALLAST	55	1,274	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	486	0.13	787	787	0.20
59	Robert L Horbelt School	Class 501	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
60	Robert L Horbelt School	Class 501	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
61	Robert L Horbelt School	Class 502	1,500	13	3L 4' F25 T8 ELE H BALLAST	83	1,609	1.07	13	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	614	0.41	995	995	0.66
62	Robert L Horbelt School	Class 502	1,500	7	COMPACT FLUORESCENT 23W HW (2)	46	483	0.32	7	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	126	0.08	357	357	0.24
63	Robert L Horbelt School	Bathroom	2,000	1	2L 4' F25 T8 ELE H BALLAST	55	110	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	42	0.02	68	68	0.03
64	Robert L Horbelt School	Class 504	1,500	13	3L 4' F25 T8 ELE H BALLAST	83	1,609	1.07	13	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	614	0.41	995	995	0.66
65	Robert L Horbelt School	Class 504	1,500	7	COMPACT FLUORESCENT 23W HW (2)	46	483	0.32	7	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	126	0.08	357	357	0.24
66	Robert L Horbelt School	Class 504	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
67	Robert L Horbelt School	Class 503	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
68	Robert L Horbelt School	Class 503	1,500	2	COMPACT FLUORESCENT 23W HW (2)	46	138	0.09	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	36	0.02	102	102	0.07
69	Robert L Horbelt School	503 Storage	800	1	3L 4' F25 T8 ELE H BALLAST	83	66	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	25	0.03	41	41	0.05
70	Robert L Horbelt School	503 Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
71	Robert L Horbelt School	Hallway	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
72	Robert L Horbelt School	Class 505A	2,200	3	3L 4' F25 T8 ELE H BALLAST	83	545	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	208	0.09	337	337	0.15
73	Robert L Horbelt School	Hall Cove	3,860	8	2L 4' F25 T8 ELE H BALLAST	55	1,698	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	648	0.17	1,050	1,050	0.27
74	Robert L Horbelt School	Class 505A	1,500	24	3L 4' F25 T8 ELE H BALLAST	83	2,970	1.98	24	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	1,134	0.76	1,836	1,836	1.22
75	Robert L Horbelt School	Class 505A	1,500	2	COMPACT FLUORESCENT 23W HW (2)	46	138	0.09	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	36	0.02	102	102	0.07
76	Robert L Horbelt School	Class 506	1,500	13	3L 4' F25 T8 ELE H BALLAST	83	1,609	1.07	13	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	614	0.41	995	995	0.66
77	Robert L Horbelt School	Class 506	1,500	7	COMPACT FLUORESCENT 23W HW (2)	46	483	0.32	7	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	126	0.08	357	357	0.24
78	Robert L Horbelt School	Class 506	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
79	Robert L Horbelt School	Class 508	1,500	13	3L 4' F25 T8 ELE H BALLAST	83	1,609	1.07	13	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	614	0.41	995	995	0.66
80	Robert L Horbelt School	Class 508	1,500	7	COMPACT FLUORESCENT 23W HW (2)	46	483	0.32	7	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	126	0.08	357	357	0.24
81	Robert L Horbelt School	Class 508	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
82	Robert L Horbelt School	Class 507	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
83	Robert L Horbelt School	Class 507	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
84	Robert L Horbelt School	Hallway	3,860	5	2L 4' F25 T8 ELE H BALLAST	55	1,062	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	405	0.11	656	656	0.17
85	Robert L Horbelt School	Hallway	3,860	8	COMPACT FLUORESCENT 23W HW (2)	46	1,420	0.37	8	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	371	0.10	1,050	1,050	0.27
86	Robert L Horbelt School	Class 509/509B	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
87	Robert L Horbelt School	Class 510/510B	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
88	Robert L Horbelt School	Class 512	1,500	13	2L 4' F25 T8 ELE H BALLAST	55	1,073	0.72	13	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	410	0.27	663	663	0.44
89	Robert L Horbelt School	512 Bathroom	2,000	1	2L 4' F25 T8 ELE H BALLAST	55	110	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	42	0.02	68	68	0.03
90	Robert L Horbelt School	Class 511	2,200	15	2L 4' F25 T8 ELE H BALLAST	55	1,815	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	693	0.32	1,122	1,122	0.51
91	Robert L Horbelt School	Hallway	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
92	Robert L Horbelt School	Class 513	2,200	15	2L 4' F25 T8 ELE H BALLAST	55	1,815	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	693	0.32	1,122	1,122	0.51
93	Robert L Horbelt School	Class 514	1,500	13	2L 4' F25 T8 ELE H BALLAST	55	1,073	0.72	13	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	410	0.27	663	663	0.44
94	Robert L Horbelt School	Class 514	1,500	1	2L 2' BIAX LAMP	71	107	0.07	1	NEW 2X2 LED FLAT PANEL FIXTURE 40 WA	40	60	0.04	47	47	0.03
95	Robert L Horbelt School	514 Bathroom	2,000	1	2L 4' F25 T8 ELE H BALLAST	55	110	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	42	0.02	68	68	0.03
96	Robert L Horbelt School	Hallway	3,860	3	2L 4' F25 T8 ELE H BALLAST	55	637	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	243	0.06	394	394	0.10
97	Robert L Horbelt School	Hallway	3,860	5	COMPACT FLUORESCENT 23W HW (2)	46	888	0.23	5	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	232	0.06	656	656	0.17
98	Robert L Horbelt School	Ladies Room	2,000	3	2L 4' F25 T8 ELE H BALLAST	55	330	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.06	204	204	0.10
99	Robert L Horbelt School	Electrical Room	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
100	Robert L Horbelt School	Electrical Room	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
101	Robert L Horbelt School	Boys Room	2,000	3	2L 4' F25 T8 ELE H BALLAST	55	330	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.06	204	204	0.10
102	Robert L Horbelt School	Class 515	2,200	15	2L 4' F25 T8 ELE H BALLAST	55	1,815	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	693	0.32	1,122	1,122	0.51
103	Robert L Horbelt School	Class 516	1,500	9	2L 4' F25 T8 ELE H BALLAST	55	743	0.50	9	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	284	0.19	459	459	0.31
104	Robert L Horbelt School	Stairwell	3,860	8	2L 4' F25 T8 ELE H BALLAST	55	1,698	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	648	0.17	1,050	1,050	0.27
105	Robert L Horbelt School	Stairwell	3,860	0	0	0			8	EMERGENCY BALLAST LED	0				0	0.00
106	Robert L Horbelt School	2ND FLOOR		0	0	0			0		0				0	0.00

CUSTOMER: **Barnegat Township School Dist**
LOCATION:
City, State, Zip Code:

GreenTecl
LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
107	Robert L Horbelt School	Class 616	1,500	9	2L 4' F25 T8 ELE H BALLAST	55	743	0.50	9	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	284	0.19	459	459	0.31
108	Robert L Horbelt School	Class 617	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
109	Robert L Horbelt School	Mens Room	2,000	3	2L 4' F25 T8 ELE H BALLAST	55	330	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.06	204	204	0.10
110	Robert L Horbelt School	Hallway	3,860	24	2L 4' F25 T8 ELE H BALLAST	55	5,095	1.32	24	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,945	0.50	3,150	3,150	0.82
111	Robert L Horbelt School	Hallway	3,860	20	COMPACT FLUORESCENT 23W HW (2)	46	3,551	0.92	20	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	926	0.24	2,625	2,625	0.68
112	Robert L Horbelt School	Hall Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
113	Robert L Horbelt School	Ladies Room	2,000	3	2L 4' F25 T8 ELE H BALLAST	55	330	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.06	204	204	0.10
114	Robert L Horbelt School	Class 614	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
115	Robert L Horbelt School	Class 615	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
116	Robert L Horbelt School	Class 612	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
117	Robert L Horbelt School	Class 613	1,500	15	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.83	15	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.32	765	765	0.51
118	Robert L Horbelt School	Stair #3	3,860	8	2L 4' F25 T8 ELE H BALLAST	55	1,698	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	648	0.17	1,050	1,050	0.27
119	Robert L Horbelt School	Stair #3	3,860	2	COMPACT FLUORESCENT 23W HW (2)	46	355	0.09	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	93	0.02	262	262	0.07
120	Robert L Horbelt School	Stair #2	3,860	7	2L 4' F25 T8 ELE H BALLAST	55	1,486	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.15	919	919	0.24
121	Robert L Horbelt School	Stair #2	3,860	2	COMPACT FLUORESCENT 23W HW (2)	46	355	0.09	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	93	0.02	262	262	0.07
122	Robert L Horbelt School	Class 611	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
123	Robert L Horbelt School	Class 611	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
124	Robert L Horbelt School	Class 610	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
125	Robert L Horbelt School	Class 610	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
126	Robert L Horbelt School	Hall Cove	3,860	8	2L 4' F25 T8 ELE H BALLAST	55	1,698	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	648	0.17	1,050	1,050	0.27
127	Robert L Horbelt School	Class 608	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
128	Robert L Horbelt School	Class 608	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
129	Robert L Horbelt School	Class 609	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
130	Robert L Horbelt School	Class 609	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
131	Robert L Horbelt School	Class 607	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
132	Robert L Horbelt School	Class 607	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
133	Robert L Horbelt School	Class 606	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
134	Robert L Horbelt School	Class 606	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
135	Robert L Horbelt School	Hall Cove	3,860	6	2L 4' F25 T8 ELE H BALLAST	55	1,274	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	486	0.13	787	787	0.20
136	Robert L Horbelt School	Class 604	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
137	Robert L Horbelt School	Class 604	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
138	Robert L Horbelt School	Class 605	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
139	Robert L Horbelt School	Class 605	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
140	Robert L Horbelt School	Class 603	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
141	Robert L Horbelt School	Class 603	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
142	Robert L Horbelt School	Class 602	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
143	Robert L Horbelt School	Class 602	1,500	3	COMPACT FLUORESCENT 23W HW (2)	46	207	0.14	3	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	54	0.04	153	153	0.10
144	Robert L Horbelt School	Boys Room	2,000	5	2L 4' F25 T8 ELE H BALLAST	55	550	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	210	0.11	340	340	0.17
145	Robert L Horbelt School	Ladies Room	2,000	5	2L 4' F25 T8 ELE H BALLAST	55	550	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	210	0.11	340	340	0.17
146	Robert L Horbelt School	Class 601B/601	1,500	12	3L 4' F25 T8 ELE H BALLAST	83	1,485	0.99	12	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	567	0.38	918	918	0.61
147	Robert L Horbelt School	Custodian Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
148	Robert L Horbelt School	Electrical Room	1,500	3	2L 4' F25 T8 ELE H BALLAST	55	248	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	95	0.06	153	153	0.10
149	Robert L Horbelt School	(2) Faculty Bathrooms	2,000	2	2L 4' F25 T8 ELE H BALLAST	55	220	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	84	0.04	136	136	0.07
150	Robert L Horbelt School	Class 600A	2,200	9	3L 4' F25 T8 ELE H BALLAST	83	1,634	0.74	9	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	624	0.28	1,010	1,010	0.46
151	Robert L Horbelt School	600A Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
152	Robert L Horbelt School	Class 600	1,500	9	3L 4' F25 T8 ELE H BALLAST	83	1,114	0.74	9	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	425	0.28	689	689	0.46
153	Robert L Horbelt School	Class 600	1,500	1	COMPACT FLUORESCENT 23W HW (2)	46	69	0.05	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	18	0.01	51	51	0.03
154	Robert L Horbelt School	Mechanical Room	1,500	8	2L 4' F25 T8 ELE H BALLAST	55	660	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.17	408	408	0.27
155	Robert L Horbelt School	Library	2,500	28	4L 4' F25 T8 ELE H BALLAST	110	7,700	3.08	28	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	2,940	1.18	4,760	4,760	1.90
156	Robert L Horbelt School	Library	2,500	2	2L 4' F25 T8 ELE H BALLAST	55	275	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	105	0.04	170	170	0.07
157	Robert L Horbelt School	Library	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
158	Robert L Horbelt School	Work Room	1,800	6	3L 4' F25 T8 ELE H BALLAST	83	891	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	340	0.19	551	551	0.31
159	Robert L Horbelt School	Storage Room	800	11	2L 4' F25 T8 ELE H BALLAST	55	484	0.61	11	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	185	0.23	299	299	0.37

CUSTOMER: **Barnegat Township School Dist**
LOCATION:
City, State, Zip Code:

GreenTech
LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
160	Robert L Horbelt School	Storage Room	800	1	COMPACT FLUORESCENT 23W HW (2)	46	37	0.05	1	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	10	0.01	27	27	0.03
161	Robert L Horbelt School	Stair #1	3,860	7	2L 4' F25 T8 ELE H BALLAST	55	1,486	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.15	919	919	0.24
162	Robert L Horbelt School	Stair #1	3,860	2	COMPACT FLUORESCENT 23W HW (2)	46	355	0.09	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	93	0.02	262	262	0.07
163	Robert L Horbelt School	Possible Emergency Ballast		0	0	0			25	EMERGENCY BALLAST LED	0				0	0.00
164	Robert L Horbelt School	EXTERIOR		0	0	0			0		0				0	0.00
165	Robert L Horbelt School	Main Canopy	4,380	4	COMPACT FLUORESCENT 23W HW (2)	46	806	0.18	4	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	210	0.05	596	596	0.00
166	Robert L Horbelt School	Main Canopy - Induction	4,380	5	50 WATT INDUCTION CANOPY FIXTURE	50	1,095	0.25	5	NEW LED CANOPY 21 WATT	21	460	0.11	635	635	0.00
167	Robert L Horbelt School	Full Face Wall Packs - New LE		0	0	0			0		0				0	0.00
168	Robert L Horbelt School	Bell Top Pole Lights	4,380	17	100 WATT MH BELL TOP POLE LIGHT	130	9,680	2.21	17	RELAMP CORN STYLE 30W LED E26	20	1,489	0.34	8,191	8,191	0.00
169	Robert L Horbelt School	Bell Top Wall Mount Fixtures	4,380	7	70 WATT MH BELL TOP WALLPACK	92	2,821	0.64	7	NEW LED WALL PACK 20 WATT	20	613	0.14	2,208	2,208	0.00
170	Robert L Horbelt School	Cutoff Wall Packs	4,380	1	COMPACT FLUORESCENT 23W HW (2)	46	201	0.05	1	NEW LED WALL PACK 20 WATT	20	88	0.02	114	114	0.00
171	Robert L Horbelt School	Recessed Cans	4,380	2	COMPACT FLUORESCENT 23W HW (2)	46	403	0.09	2	RETROFIT HIGH HAT 12 WATT LED 6 INCH	12	105	0.02	298	298	0.00
	Total: Robert L Horbelt School			**1,127**			**174,622**	**78.67**	**1,160**			**61,725**	**28.60**	**112,898**	**112,898**	**47.32**

CUSTOMER: Barnegat Township School Dist
LOCATION:
City, State, Zip Code:

GreenTech
LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
1	Joseph T Donahue Elementary School	2ND FLOOR		0	0	0			0		0				0	0.00
2	Joseph T Donahue Elementary School	Mechanical Room	1,500	14	2L 4' F25 T8 ELE H BALLAST	55	1,155	0.77	14	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	441	0.29	714	714	0.48
3	Joseph T Donahue Elementary School	Faculty Room	2,500	9	2L 4' F25 T8 ELE H BALLAST	55	1,238	0.50	9	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	473	0.19	765	765	0.31
4	Joseph T Donahue Elementary School	(2) Bathrooms	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
5	Joseph T Donahue Elementary School	2nd Floor Hallways	3,860	18	2L 4' F25 T8 ELE H BALLAST	55	3,821	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,459	0.38	2,362	2,362	0.61
6	Joseph T Donahue Elementary School	Display	3,860	1	1 LAMP 3 FT F30 T12 STD / STD	46	178	0.05	1	RETROFIT 3' 1L LED TUBE / SELF BALLAST	10	39	0.01	139	139	0.04
7	Joseph T Donahue Elementary School	Class 207	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
8	Joseph T Donahue Elementary School	Class 206	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
9	Joseph T Donahue Elementary School	Class 205	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
10	Joseph T Donahue Elementary School	Class 204	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
11	Joseph T Donahue Elementary School	Class 203	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
12	Joseph T Donahue Elementary School	Class 202	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
13	Joseph T Donahue Elementary School	Class 201	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
14	Joseph T Donahue Elementary School	Class 200	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
15	Joseph T Donahue Elementary School	SGI 208	1,500	8	2L 4' F25 T8 ELE H BALLAST	55	660	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.17	408	408	0.27
16	Joseph T Donahue Elementary School	Custodian	400	2	2L 4' F25 T8 ELE H BALLAST	55	44	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.04	27	27	0.07
17	Joseph T Donahue Elementary School	Mens Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
18	Joseph T Donahue Elementary School	Ladies Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
19	Joseph T Donahue Elementary School	Stairs #1	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
20	Joseph T Donahue Elementary School	Stairs #2	3,860	4	2L 4' F25 T8 ELE H BALLAST	55	849	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	324	0.08	525	525	0.14
21	Joseph T Donahue Elementary School	Elevator Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
22	Joseph T Donahue Elementary School	Elevator	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
23	Joseph T Donahue Elementary School	1ST FLOOR		0	0	0			0		0				0	0.00
24	Joseph T Donahue Elementary School	Hallway	3,860	18	2L 4' F25 T8 ELE H BALLAST	55	3,821	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	1,459	0.38	2,362	2,362	0.61
25	Joseph T Donahue Elementary School	Display	3,860	1	1 LAMP 3 FT F30 T12 STD / STD	46	178	0.05	1	RETROFIT 3' 1L LED TUBE / SELF BALLAST	10	39	0.01	139	139	0.04
26	Joseph T Donahue Elementary School	Class 107	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
27	Joseph T Donahue Elementary School	Class 106	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
28	Joseph T Donahue Elementary School	Class 105	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
29	Joseph T Donahue Elementary School	Class 104	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
30	Joseph T Donahue Elementary School	Class 103	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
31	Joseph T Donahue Elementary School	Class 102	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
32	Joseph T Donahue Elementary School	Class 101	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
33	Joseph T Donahue Elementary School	Class 100	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
34	Joseph T Donahue Elementary School	SGI Room	1,500	8	2L 4' F25 T8 ELE H BALLAST	55	660	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.17	408	408	0.27
35	Joseph T Donahue Elementary School	Girls Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
36	Joseph T Donahue Elementary School	Boys Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
37	Joseph T Donahue Elementary School	Custodian Closet	400	2	2L 4' F25 T8 ELE H BALLAST	55	44	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.04	27	27	0.07
38	Joseph T Donahue Elementary School	Large Lobby	3,860	49	2L 2' BIAX LAMP	71	13,429	3.48	49	NEW 2X2 LED FLAT PANEL FIXTURE 40 WA	40	7,566	1.96	5,863	5,863	1.52
39	Joseph T Donahue Elementary School	Large Lobby	3,860	1	3L 4' F25 T8 ELE H BALLAST	83	318	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	122	0.03	197	197	0.05
40	Joseph T Donahue Elementary School	Mail Room	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
41	Joseph T Donahue Elementary School	Side Door	3,860	1	3L 4' F25 T8 ELE H BALLAST	83	318	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	122	0.03	197	197	0.05
42	Joseph T Donahue Elementary School	Electrical Room	1,500	6	2L 4' F25 T8 ELE H BALLAST	55	495	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.13	306	306	0.20
43	Joseph T Donahue Elementary School	Mens Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
44	Joseph T Donahue Elementary School	Custodian	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
45	Joseph T Donahue Elementary School	Girls Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
46	Joseph T Donahue Elementary School	Supply Room	800	1	3L 4' F25 T8 ELE H BALLAST	83	66	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	25	0.03	41	41	0.05
47	Joseph T Donahue Elementary School	Class 123	1,500	18	2L 4' F25 T8 ELE H BALLAST	55	1,485	0.99	18	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	567	0.38	918	918	0.61
48	Joseph T Donahue Elementary School	Class 122	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
49	Joseph T Donahue Elementary School	Main Gym	3,000	15	EXISTING 2x4 6L T5	351	15,795	5.27	15	RETROFIT 4' 6L T5 LED TUBE / SELF BALLA	150	6,750	2.25	9,045	9,045	3.02
50	Joseph T Donahue Elementary School	Main Gym	3,000	13	70 WATT MH FLOOD	92	3,588	1.20	13	NEW LED FLOOD 14 WATT	14	546	0.18	3,042	3,042	1.01
51	Joseph T Donahue Elementary School	Gym Storage	800	8	2L 4' F25 T8 ELE H BALLAST	55	352	0.44	8	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	134	0.17	218	218	0.27

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
52	Joseph T Donahue Elementary School	Stage - 8L Sports Light	2,500	13	COMPACT FLUORESCENT (8) LAMP 42 WATT S	336	10,920	4.37	13	NEW LED HIGH BAY 150 WATT	150	4,875	1.95	6,045	6,045	2.42
53	Joseph T Donahue Elementary School	Chair Lift	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
54	Joseph T Donahue Elementary School	Stage Storage	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
55	Joseph T Donahue Elementary School	Music 134A	1,500	17	2L 4' F25 T8 ELE H BALLAST	55	1,403	0.94	17	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	536	0.36	867	867	0.58
56	Joseph T Donahue Elementary School	134A Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
57	Joseph T Donahue Elementary School	Gym Office	1,800	3	3L 4' F25 T8 ELE H BALLAST	83	446	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	170	0.09	275	275	0.15
58	Joseph T Donahue Elementary School	Gym Office	1,800	1	2L 2' F17 ELE N BALLAST	34	61	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	25	0.01	36	36	0.02
59	Joseph T Donahue Elementary School	Bathroom	2,000	2	2L 4' F25 T8 ELE H BALLAST	55	220	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	84	0.04	136	136	0.07
60	Joseph T Donahue Elementary School	Bathroom	2,000	1	COMPACT FLUORESCENT 13W S/I	13	26	0.01	1	RELAMP 9 WATT LED A LAMP S/I	9	18	0.01	8	8	0.00
61	Joseph T Donahue Elementary School	Library	2,500	6	2L 2' BIAX LAMP	71	1,065	0.43	6	NEW 2X2 LED FLAT PANEL FIXTURE 40 WA	40	600	0.24	465	465	0.19
62	Joseph T Donahue Elementary School	Library	2,500	6	COMPACT FLUORESCENT 13W HW	13			6	NO CHANGE	0				0	0.00
63	Joseph T Donahue Elementary School	Library	2,500	52	2L 4' F25 T8 ELE H BALLAST	55	7,150	2.86	52	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	2,730	1.09	4,420	4,420	1.77
64	Joseph T Donahue Elementary School	Library Office	1,800	4	3L 4' F25 T8 ELE H BALLAST	83	594	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	227	0.13	367	367	0.20
65	Joseph T Donahue Elementary School	Book Storage	800	4	3L 4' F25 T8 ELE H BALLAST	83	264	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	101	0.13	163	163	0.20
66	Joseph T Donahue Elementary School	Supply Room	800	2	2L 4' F25 T8 ELE H BALLAST	55	88	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	34	0.04	54	54	0.07
67	Joseph T Donahue Elementary School	Library Cove Large - Salad Bo	2,500	1	0	0			0		0				0	0.00
68	Joseph T Donahue Elementary School	Lobby Display	3,860	1	1 LAMP 3 FT F30 T12 STD / STD	46	178	0.05	1	RETROFIT 3' 1L LED TUBE / SELF BALLAST	10	39	0.01	139	139	0.04
69	Joseph T Donahue Elementary School	Lobby Center	3,860	4	70 WATT MH FLOOD	92	1,420	0.37	4	NEW LED FLOOD 14 WATT	14	216	0.06	1,204	1,204	0.31
70	Joseph T Donahue Elementary School	Cafeteria - 8L Sports Light	2,500	25	COMPACT FLUORESCENT (8) LAMP 42 WATT S	336	21,000	8.40	25	NEW LED HIGH BAY 150 WATT	150	9,375	3.75	11,625	11,625	4.65
71	Joseph T Donahue Elementary School	Receiving	2,000	10	2L 4' F25 T8 ELE H BALLAST	55	1,100	0.55	10	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	420	0.21	680	680	0.34
72	Joseph T Donahue Elementary School	Food Serving	2,000	8	3L 4' F25 T8 ELE H BALLAST	83	1,320	0.66	8	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	504	0.25	816	816	0.41
73	Joseph T Donahue Elementary School	Faculty Dining	1,800	6	3L 4' F25 T8 ELE H BALLAST	83	891	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	340	0.19	551	551	0.31
74	Joseph T Donahue Elementary School	Kitchen	2,000	15	3L 4' F25 T8 ELE H BALLAST	83	2,475	1.24	15	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	945	0.47	1,530	1,530	0.77
75	Joseph T Donahue Elementary School	Coolers	800	4	60 WATT INCANDESCENT	60	192	0.24	4	RELAMP 9 WATT LED A LAMP S/I	9	29	0.04	163	163	0.20
76	Joseph T Donahue Elementary School	Storage Room	800	6	2L 4' F25 T8 ELE H BALLAST	55	264	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	101	0.13	163	163	0.20
77	Joseph T Donahue Elementary School	Ladies Room	2,000	1	2L 4' F25 T8 ELE H BALLAST	55	110	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	42	0.02	68	68	0.03
78	Joseph T Donahue Elementary School	Kitchen Office	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
79	Joseph T Donahue Elementary School	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
80	Joseph T Donahue Elementary School	Stove Hoods	2,000	4	2L 4' F25 T8 ELE H BALLAST	55	440	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	168	0.08	272	272	0.14
81	Joseph T Donahue Elementary School	Main Office	2,500	11	2L 4' F25 T8 ELE H BALLAST	55	1,513	0.61	11	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	578	0.23	935	935	0.37
82	Joseph T Donahue Elementary School	Work Room	2,500	3	3L 4' F25 T8 ELE H BALLAST	83	619	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	236	0.09	383	383	0.15
83	Joseph T Donahue Elementary School	Files Room	800	2	3L 4' F25 T8 ELE H BALLAST	83	132	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	50	0.06	82	82	0.10
84	Joseph T Donahue Elementary School	Conference Room	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
85	Joseph T Donahue Elementary School	Conference Room	2,500	6	COMPACT FLUORESCENT 23W HW	23	345	0.14	6	RETROFIT HIGH HAT 12 WATT LED 8 INCH	12	180	0.07	165	165	0.07
86	Joseph T Donahue Elementary School	Guidance	1,800	2	3L 4' F25 T8 ELE H BALLAST	83	297	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	113	0.06	184	184	0.10
87	Joseph T Donahue Elementary School	Guidance	1,800	2	2L 2' BIAX LAMP	71	256	0.14	2	NEW 2X2 LED FLAT PANEL FIXTURE 40 WA	40	144	0.08	112	112	0.06
88	Joseph T Donahue Elementary School	Principal	1,800	4	3L 4' F25 T8 ELE H BALLAST	83	594	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	227	0.13	367	367	0.20
89	Joseph T Donahue Elementary School	Side Office	1,800	4	3L 4' F25 T8 ELE H BALLAST	83	594	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	227	0.13	367	367	0.20
90	Joseph T Donahue Elementary School	Bathroom	3,860	2	2L 4' F25 T8 ELE H BALLAST	55	425	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	162	0.04	262	262	0.07
91	Joseph T Donahue Elementary School	Speech Room	2,200	3	3L 4' F25 T8 ELE H BALLAST	83	545	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	208	0.09	337	337	0.15
92	Joseph T Donahue Elementary School	Nurse Suite	1,800	8	4L 4' F25 T8 ELE H BALLAST	110	1,584	0.88	8	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	605	0.34	979	979	0.54
93	Joseph T Donahue Elementary School	Nurse Suite	1,800	3	3L 4' F25 T8 ELE H BALLAST	83	446	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	170	0.09	275	275	0.15
94	Joseph T Donahue Elementary School	Electrical Room	1,500	4	2L 4' F25 T8 ELE H BALLAST	55	330	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	126	0.08	204	204	0.14
95	Joseph T Donahue Elementary School	Data Room	1,500	2	2L 4' F25 T8 ELE H BALLAST	55	165	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	63	0.04	102	102	0.07
96	Joseph T Donahue Elementary School	Hallway	3,860	25	2L 4' F25 T8 ELE H BALLAST	55	5,308	1.38	25	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	2,027	0.53	3,281	3,281	0.85
97	Joseph T Donahue Elementary School	Display	3,860	1	1 LAMP 3 FT F30 T12 STD / STD	46	178	0.05	1	RETROFIT 3' 1L LED TUBE / SELF BALLAST	10	39	0.01	139	139	0.04
98	Joseph T Donahue Elementary School	Class J	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
99	Joseph T Donahue Elementary School	Class A	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
100	Joseph T Donahue Elementary School	Class B	1,500	6	2L 4' F25 T8 ELE H BALLAST	55	495	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.13	306	306	0.20
101	Joseph T Donahue Elementary School	Class C	1,500	14	2L 4' F25 T8 ELE H BALLAST	55	1,155	0.77	14	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	441	0.29	714	714	0.48
102	Joseph T Donahue Elementary School	C Storage	800	1	2L 4' F25 T8 ELE H BALLAST	55	44	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.02	27	27	0.03

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LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
103	Joseph T Donahue Elementary School	Class D	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
104	Joseph T Donahue Elementary School	Class D	1,500	1	2L 4' F25 T8 ELE H BALLAST	55	83	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	32	0.02	51	51	0.03
105	Joseph T Donahue Elementary School	Class E	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
106	Joseph T Donahue Elementary School	Class E Bathroom	2,000	1	2L 4' F25 T8 ELE H BALLAST	55	110	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	42	0.02	68	68	0.03
107	Joseph T Donahue Elementary School	Class F	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
108	Joseph T Donahue Elementary School	F Bathroom	2,000	1	2L 4' F25 T8 ELE H BALLAST	55	110	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	42	0.02	68	68	0.03
109	Joseph T Donahue Elementary School	SGI Rooms	1,500	16	2L 4' F25 T8 ELE H BALLAST	55	1,320	0.88	16	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	504	0.34	816	816	0.54
110	Joseph T Donahue Elementary School	Class G	1,500	14	2L 4' F25 T8 ELE H BALLAST	55	1,155	0.77	14	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	441	0.29	714	714	0.48
111	Joseph T Donahue Elementary School	G Bath	2,000	1	2L 4' F25 T8 ELE H BALLAST	55	110	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	42	0.02	68	68	0.03
112	Joseph T Donahue Elementary School	Faculty Room	1,800	9	2L 4' F25 T8 ELE H BALLAST	55	891	0.50	9	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	340	0.19	551	551	0.31
113	Joseph T Donahue Elementary School	Bathroom	2,000	1	2L 4' F25 T8 ELE H BALLAST	55	110	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	42	0.02	68	68	0.03
114	Joseph T Donahue Elementary School	Class I	1,500	12	2L 4' F25 T8 ELE H BALLAST	55	990	0.66	12	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	378	0.25	612	612	0.41
115	Joseph T Donahue Elementary School	Boys Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
116	Joseph T Donahue Elementary School	Custodian Closet	400	2	2L 4' F25 T8 ELE H BALLAST	55	44	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	17	0.04	27	27	0.07
117	Joseph T Donahue Elementary School	Girls Room	2,000	6	2L 4' F25 T8 ELE H BALLAST	55	660	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	252	0.13	408	408	0.20
118	Joseph T Donahue Elementary School	Possible Emergency Ballast		0	0	0			25	EMERGENCY BALLAST LED	0				0	0.00
119	Joseph T Donahue Elementary School	EXTERIOR		0	0	0			0		0				0	0.00
120	Joseph T Donahue Elementary School	Large Wall Sconces	4,380	8	EXISTING DECORATIVE FIXTURES	0			8	NO CHANGE	0				0	0.00
121	Joseph T Donahue Elementary School	Small Wall Sconces	4,380	24	EXISTING DECORATIVE FIXTURES	0			24	NO CHANGE	0				0	0.00
122	Joseph T Donahue Elementary School	Full Face Wall Packs	4,380	30	70 WATT MH WALLPACK	92	12,089	2.76	30	NEW LED WALL PACK 20 WATT	20	2,628	0.60	9,461	9,461	0.00
123	Joseph T Donahue Elementary School	Indirect Floods	4,380	4	75 WATT INCAN FLOOD	75	1,314	0.30	4	RELAMP 20 WATT LED FLOOD S/I	20	350	0.08	964	964	0.00
124	Joseph T Donahue Elementary School	Shoe Box Pole Lights	4,380	27	200 WATT INDUCTION SHOEBOX	200	23,652	5.40	27	NEW LED SHOEBOX LOT 100 WATT ARM	100	11,826	2.70	11,826	11,826	0.00
	Total: Joseph T Donahue Elementary School			**986**			**187,445**	**75.89**	**1,066**			**76,432**	**30.50**	**111,013**	**111,013**	**40.30**

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LIGHTING

	LOCATION:		EXISTING							PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
1	Administration Building	Main Entrance	2,500	3	2L 4' F25 T8 ELE H BALLAST	55	413	0.17	3	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	158	0.06	255	255	0.10
2	Administration Building	Closet	400	1	2L 4' F25 T8 ELE H BALLAST	55	22	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	8	0.02	14	14	0.03
3	Administration Building	Conference Room	2,500	6	3L 4' F25 T8 ELE H BALLAST	83	1,238	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	473	0.19	765	765	0.31
4	Administration Building	Hallway	2,500	7	2L 4' F25 T8 ELE H BALLAST	55	963	0.39	7	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	368	0.15	595	595	0.24
5	Administration Building	Side Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
6	Administration Building	Files Room	2,500	2	2L 4' F25 T8 ELE H BALLAST	55	275	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	105	0.04	170	170	0.07
7	Administration Building	Reception Area	2,500	5	2L 4' F25 T8 ELE H BALLAST	55	688	0.28	5	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	263	0.11	425	425	0.17
8	Administration Building	Side Office	2,500	6	3L 4' F25 T8 ELE H BALLAST	83	1,238	0.50	6	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	473	0.19	765	765	0.31
9	Administration Building	Side Office	2,500	3	3L 4' F25 T8 ELE H BALLAST	83	619	0.25	3	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	236	0.09	383	383	0.15
10	Administration Building	Side Office	2,500	1	2L 4' F25 T8 ELE H BALLAST	55	138	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	53	0.02	85	85	0.03
11	Administration Building	(2) Bathrooms	2,500	2	2L 4' F25 T8 ELE H BALLAST	55	275	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	105	0.04	170	170	0.07
12	Administration Building	Side Office	2,500	4	2L 4' F25 T8 ELE H BALLAST	55	550	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	210	0.08	340	340	0.14
13	Administration Building	Cubical Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
14	Administration Building	Kitchen / Break Room	2,500	2	2L 4' F25 T8 ELE H BALLAST	55	275	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	105	0.04	170	170	0.07
15	Administration Building	Side Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
16	Administration Building	Side Office	2,500	4	3L 4' F25 T8 ELE H BALLAST	83	825	0.33	4	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	315	0.13	510	510	0.20
17	Administration Building	Side Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
18	Administration Building	Side Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
19	Administration Building	Cubical Office	2,500	1	3L 4' F25 T8 ELE H BALLAST	83	206	0.08	1	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	79	0.03	128	128	0.05
20	Administration Building	Cubical Office	2,500	2	2L 4' F25 T8 ELE H BALLAST	55	275	0.11	2	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	105	0.04	170	170	0.07
21	Administration Building	Main Receptionist Office	2,500	2	3L 4' F25 T8 ELE H BALLAST	83	413	0.17	2	RETROFIT 4' 3L LED TUBE / SELF BALLAST	32	158	0.06	255	255	0.10
	Total: Administration Building			**61**			**10,472**	**4.24**	**61**			**3,998**	**1.62**	**6,474**	**6,474**	**2.62**

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LIGHTING

	LOCATION:		EXISTING						PROPOSED					SAVINGS		
Line Ref	Building	Location	Existing Hrs. per Year	Existing QTY	Existing Lighting Description	Existing WATT / Fixture	Existing KWH Usage	Existing KW Usage	Proposed QTY	Proposed Lighting Description	Proposed WATT / Fixture	Proposed KWH Usage	Proposed Kw Usage	KWH Saved	Total KWH Saved	KW Saved
1	Transportation / Buildings & Grounds	Warehouse	2,500	21	2L 8' T8 F96 ELE N BALLAST	95	4,988	2.00	21	RETROFIT 8' 2L TO 4' 4 LED TUBE /SELF BA	42	2,205	0.88	2,783	2,783	1.11
2	Transportation / Buildings & Grounds	Warehouse Office	2,500	6	2L 4' F25 T8 ELE H BALLAST	55	825	0.33	6	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	315	0.13	510	510	0.20
3	Transportation / Buildings & Grounds	Transportation & Grounds Offi	2,500	4	4L 4' F25 T8 ELE H BALLAST	110	1,100	0.44	4	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	420	0.17	680	680	0.27
4	Transportation / Buildings & Grounds	Transportation & Grounds Offi	2,500	1	2L 4' F25 T8 ELE H BALLAST	55	138	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	53	0.02	85	85	0.03
5	Transportation / Buildings & Grounds	Side Office	2,500	2	4L 4' F25 T8 ELE H BALLAST	110	550	0.22	2	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	210	0.08	340	340	0.14
6	Transportation / Buildings & Grounds	Side Office	2,500	1	4L 4' F25 T8 ELE H BALLAST	110	275	0.11	1	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	105	0.04	170	170	0.07
7	Transportation / Buildings & Grounds	Copier Room	2,500	1	4L 4' F25 T8 ELE H BALLAST	110	275	0.11	1	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	105	0.04	170	170	0.07
8	Transportation / Buildings & Grounds	Side Office	2,500	1	4L 4' F25 T8 ELE H BALLAST	110	275	0.11	1	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	105	0.04	170	170	0.07
9	Transportation / Buildings & Grounds	Mechanical Room	1,500	1	60 WATT INCANDESCENT	60	90	0.06	1	RELAMP 9 WATT LED A LAMP S/I	9	14	0.01	77	77	0.05
10	Transportation / Buildings & Grounds	Hallway	2,500	1	2L 4' F25 T8 ELE H BALLAST	55	138	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	53	0.02	85	85	0.03
11	Transportation / Buildings & Grounds	Neil Piro's Office	2,500	1	4L 4' F25 T8 ELE H BALLAST	110	275	0.11	1	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	105	0.04	170	170	0.07
12	Transportation / Buildings & Grounds	Supply Room	800	1	4L 4' F25 T8 ELE H BALLAST	110	88	0.11	1	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	34	0.04	54	54	0.07
13	Transportation / Buildings & Grounds	Pantry	2,500	1	2L 2' F17 ELE N BALLAST	34	85	0.03	1	RETROFIT 2' 2L LED TUBE / SELF BALLAST	14	35	0.01	50	50	0.02
14	Transportation / Buildings & Grounds	Bathroom	2,500	1	60 WATT INCANDESCENT	60	150	0.06	1	RELAMP 9 WATT LED A LAMP S/I	9	23	0.01	128	128	0.05
15	Transportation / Buildings & Grounds	Bus Garage	2,500	18	2L 8' T8 F96 ELE N BALLAST	95	4,275	1.71	18	RETROFIT 8' 2L TO 4' 4 LED TUBE /SELF BA	42	1,890	0.76	2,385	2,385	0.95
16	Transportation / Buildings & Grounds	Parts Room	2,500	3	2L 8' T8 F96 ELE N BALLAST	95	713	0.29	3	RETROFIT 8' 2L TO 4' 4 LED TUBE /SELF BA	42	315	0.13	398	398	0.16
17	Transportation / Buildings & Grounds	Parts Room	2,500	1	4L 4' F25 T8 ELE H BALLAST	110	275	0.11	1	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	105	0.04	170	170	0.07
18	Transportation / Buildings & Grounds	Loft	800	2	2L 8' T8 F96 ELE N BALLAST	95	152	0.19	2	RETROFIT 8' 2L TO 4' 4 LED TUBE /SELF BA	42	67	0.08	85	85	0.11
19	Transportation / Buildings & Grounds	Office	2,500	1	4L 4' F25 T8 ELE H BALLAST	110	275	0.11	1	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	105	0.04	170	170	0.07
20	Transportation / Buildings & Grounds	Tank Room	2,500	2	4L 4' F25 T8 ELE H BALLAST	110	550	0.22	2	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	210	0.08	340	340	0.14
21	Transportation / Buildings & Grounds	Tire Room	2,500	2	4L 4' F25 T8 ELE H BALLAST	110	550	0.22	2	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	210	0.08	340	340	0.14
22	Transportation / Buildings & Grounds	(2) Bathroom	2,500	2	60 WATT INCANDESCENT	60	300	0.12	2	RELAMP 9 WATT LED A LAMP S/I	9	45	0.02	255	255	0.10
23	Transportation / Buildings & Grounds	Bus Drivers Lounge Hallway	1,000	1	2L 4' F25 T8 ELE H BALLAST	55	55	0.06	1	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	21	0.02	34	34	0.03
24	Transportation / Buildings & Grounds	(2) Bathroom	1,000	4	60 WATT INCANDESCENT	60	240	0.24	4	RELAMP 9 WATT LED A LAMP S/I	9	36	0.04	204	204	0.20
25	Transportation / Buildings & Grounds	Files Room	1,000	3	4L 4' F25 T8 ELE H BALLAST	110	330	0.33	3	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	126	0.13	204	204	0.20
26	Transportation / Buildings & Grounds	Kitchen / Drivers Lounge	1,000	10	4L 4' F25 T8 ELE H BALLAST	110	1,100	1.10	10	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	420	0.42	680	680	0.68
27	Transportation / Buildings & Grounds	Large Storage	800	28	4L 4' F25 T8 ELE H BALLAST	110	2,464	3.08	28	RETROFIT 4' 4L LED TUBE / SELF BALLAST	42	941	1.18	1,523	1,523	1.90
28	Transportation / Buildings & Grounds	Large Storage	800	4	2L 4' F25 T8 ELE H BALLAST	55	176	0.22	4	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	67	0.08	109	109	0.14
29	Transportation / Buildings & Grounds	Large Storage	800	5	65 WATT INCAN FLOOD	65	260	0.33	5	RELAMP 15 WATT LED FLOOD S/I	15	60	0.08	200	200	0.25
30	Transportation / Buildings & Grounds	Bus Drivers Lockers	1,000	9	2L 4' F25 T8 ELE H BALLAST	55	495	0.50	9	RETROFIT 4' 2L LED TUBE / SELF BALLAST	21	189	0.19	306	306	0.31
31	Transportation / Buildings & Grounds	Exterior Lighting		0	0	0			0		0				0	0.00
32	Transportation / Buildings & Grounds	Wall Mount Flood Fixtures	4,380	3	250 WATT MH FLOOD	295	3,876	0.89	3	NEW LED FLOOD 52 WATT	52	683	0.16	3,193	3,193	0.00
33	Transportation / Buildings & Grounds	Full Face Wall Packs	4,380	2	100 WATT HPS WALLPACK	120	1,051	0.24	2	NEW LED WALL PACK 20 WATT	20	175	0.04	876	876	0.00
34	Transportation / Buildings & Grounds	Full Face Wall Packs	4,380	1	250 WATT MH WALLPACK	295	1,292	0.30	1	NEW LED WALL PACK 20 WATT	20	88	0.02	1,205	1,205	0.00
35	Transportation / Buildings & Grounds	Screw In Floods	4,380	2	65 WATT INCAN FLOOD	65	569	0.13	2	RELAMP 15 WATT LED FLOOD S/I	15	131	0.03	438	438	0.00
36	Transportation / Buildings & Grounds	Wall Mount Incandescents	4,380	4	60 WATT INCANDESCENT	60	1,051	0.24	4	RELAMP 9 WATT LED A LAMP S/I	9	158	0.04	894	894	0.00
	Total: Transportation / Buildings & Grounds			**150**			**29,300**	**14.40**	**192**			**9,822**	**5.19**	**19,478**	**19,478**	**7.70**
	Grand Total						**1,080,458**	**450.56**	**6,603**					**649,516**		**247.99**

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
1	Barnegat High School	Main Entry		3,860	6	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
2	Barnegat High School	Main Lobby - Large Salad Bov		3,860	3	EXISTING DECORATIVE FIXTURES	0	0	0			0
3	Barnegat High School	Main Lobby - Small Salad Bov		3,860	4	EXISTING DECORATIVE FIXTURES	0	0	0			0
4	Barnegat High School	Main Lobby		3,860	44	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
5	Barnegat High School	Main Lobby		3,860	5	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
6	Barnegat High School	Main Office		1,800	21	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
7	Barnegat High School	Main Office		1,800	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
8	Barnegat High School	Conference Room		1,800	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
9	Barnegat High School	Assistant Principal		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
10	Barnegat High School	Assistant Principal		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
11	Barnegat High School	Work Room		1,800	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
12	Barnegat High School	Principal		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
13	Barnegat High School	Bathroom		2,000	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
14	Barnegat High School	Office #6		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
15	Barnegat High School	Attend. Office		1,800	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
16	Barnegat High School	Rogers Office		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
17	Barnegat High School	Office #2		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
18	Barnegat High School	Office #5		1,800	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
19	Barnegat High School	Office #3		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
20	Barnegat High School	Office #4		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
21	Barnegat High School	HALLS & BATHROOMS - Nev			0	0	0	0	0			0
22	Barnegat High School	End Office		1,800	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
23	Barnegat High School	Mail Room		2,500	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
24	Barnegat High School	Security		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
25	Barnegat High School	Library		2,500	85	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
26	Barnegat High School	Library		2,500	8	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
27	Barnegat High School	Library		2,500	11	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
28	Barnegat High School	Library		2,500	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
29	Barnegat High School	Side Entry		3,860	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
30	Barnegat High School	Periodicals		800	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
31	Barnegat High School	Data Room		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
32	Barnegat High School	Library 1 / Computers		1,500	9	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
33	Barnegat High School	Concession		800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
34	Barnegat High School	Library 2		1,500	17	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
35	Barnegat High School	Library Workroom		1,800	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
36	Barnegat High School	Library 3		1,500	13	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
37	Barnegat High School	Trophy Cases		3,860	9	RETROFIT 3' 1L LED TUBE / SELF BALLA	10	0	0			0
38	Barnegat High School	Gym Lobby		3,860	74	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
39	Barnegat High School	Gym Lobby - Salad Bowl Fixtu		3,860	4	EXISTING DECORATIVE FIXTURES	0	0	0			0
40	Barnegat High School	Main Gym		3,000	60	RETROFIT 4' 4L T5 LED TUBE / SELF BAI	100	0	0			0
41	Barnegat High School	Weight Room		3,000	20	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
42	Barnegat High School	Trainers Room		2,500	7	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
43	Barnegat High School	Trainers Room		2,500	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
44	Barnegat High School	Gym Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
45	Barnegat High School	Mechanical Room		1,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
46	Barnegat High School	Storage Room		800	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
47	Barnegat High School	Storage Room		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0

CUSTOMER:	**Barnegat Township School Dist**	**CUSTOMER:**	**Barnegat Township School District**		*GreenTech Energy Services*
LOCATION:		**LOCATION:**			**LIGHTING CONTROL**
City, State, Zip Code:		**City, State, Zip Code:**		0	
		0			
		0			

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
48	Barnegat High School	Stage - N/A			0	0	0	0	0			0
49	Barnegat High School	Mechanical Room M3		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
50	Barnegat High School	Mechanical Room M2		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
51	Barnegat High School	Boys Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
52	Barnegat High School	Boys Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
53	Barnegat High School	Boys Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
54	Barnegat High School	Girls Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
55	Barnegat High School	Girls Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
56	Barnegat High School	Girls Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
57	Barnegat High School	E101 Entry		3,860	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
58	Barnegat High School	E101 - New LED			0	0	0	0	0			0
59	Barnegat High School	E103 - New LED			0	0	0	0	0			0
60	Barnegat High School	E103 Side Rooms		800	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
61	Barnegat High School	E105 Class		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
62	Barnegat High School	E105 Class		1,500	5	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
63	Barnegat High School	Storage S7		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
64	Barnegat High School	Nurse Office		1,800	9	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
65	Barnegat High School	Lockers Lobby		3,860	4	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
66	Barnegat High School	Boys Lockers		3,000	19	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
67	Barnegat High School	Boys Lockers		3,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
68	Barnegat High School	Boys Lockers		3,000	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
69	Barnegat High School	Boys Lockers		3,000	4	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
70	Barnegat High School	Coaches Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
71	Barnegat High School	Coaches Office		2,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
72	Barnegat High School	Gym Side Hall		3,860	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
73	Barnegat High School	Girls Lockers		3,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
74	Barnegat High School	Girls Lockers		3,000	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
75	Barnegat High School	Girls Lockers		3,000	4	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
76	Barnegat High School	Girls Lockers		3,000	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
77	Barnegat High School	Girls Lockers		3,000	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
78	Barnegat High School	Wrestling		3,000	20	RETROFIT 4' 4L T5 LED TUBE / SELF BAL	100	0	0			0
79	Barnegat High School	Wrestling		3,000	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
80	Barnegat High School	S6 Storage		800	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
81	Barnegat High School	Athletics		1,800	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
82	Barnegat High School	Guidance Entry		1,800	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
83	Barnegat High School	Guidance Conference Room		1,800	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
84	Barnegat High School	Janitor JCJ		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
85	Barnegat High School	Hall Bathroom		2,000	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
86	Barnegat High School	Faculty Dining		1,800	21	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
87	Barnegat High School	Upper Mechanical Room		1,500	22	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
88	Barnegat High School	Upper Mech. Room - Emer Ba		1,500	0	0	0	0	0			0
89	Barnegat High School	Data Room 3		800	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
90	Barnegat High School	Electrical Room		1,500	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
91	Barnegat High School	Gym #2		3,000	24	RETROFIT 4' 4L T5 LED TUBE / SELF BAL	100	0	0			0
92	Barnegat High School	Gym Storage		800	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
93	Barnegat High School	(2) Hall Bathrooms		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
94	Barnegat High School	(2) Hall Bathrooms		2,000	4	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0

LOCATION:			EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
95	Barnegat High School	(2) Hall Bathrooms		2,000	4	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
96	Barnegat High School	Cafeteria Entry		3,860	6	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
97	Barnegat High School	S4 Storage		800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
98	Barnegat High School	Student Store		800	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
99	Barnegat High School	JC6 Closet		400	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
100	Barnegat High School	Kitchen Serving		1,800	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
101	Barnegat High School	Kitchen Serving		1,800	6	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
102	Barnegat High School	Kitchen		2,000	15	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
103	Barnegat High School	Stove Hoods		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
104	Barnegat High School	Lockers / Bathroom		2,000	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
105	Barnegat High School	Mop Room		400	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
106	Barnegat High School	Coolers		800	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
107	Barnegat High School	Coolers		800	2	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
108	Barnegat High School	Facilities		2,500	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
109	Barnegat High School	West Stairs		3,860	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
110	Barnegat High School	West Stairs		3,860	0	0	0	0	0			0
111	Barnegat High School	West Stairs		3,860	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
112	Barnegat High School	Class B213		1,500	15	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
113	Barnegat High School	Prep B211A		1,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
114	Barnegat High School	Class B212		1,500	15	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
115	Barnegat High School	Prep B210A		1,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
116	Barnegat High School	Class B210		1,500	15	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
117	Barnegat High School	Class B211		1,500	15	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
118	Barnegat High School	Class B208		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
119	Barnegat High School	Class B206		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
120	Barnegat High School	Class B209		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
121	Barnegat High School	Class B207		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
122	Barnegat High School	Class B204		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
123	Barnegat High School	Class B203		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
124	Barnegat High School	Class B205		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
125	Barnegat High School	Mens Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
126	Barnegat High School	Mens Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
127	Barnegat High School	Mens Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
128	Barnegat High School	JC4 Closet		400	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
129	Barnegat High School	Faculty Bathroom		2,000	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
130	Barnegat High School	Girls Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
131	Barnegat High School	Girls Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
132	Barnegat High School	Girls Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
133	Barnegat High School	Hall Storage		800	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
134	Barnegat High School	Elevator		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
135	Barnegat High School	Class B202		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
136	Barnegat High School	Class B201		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
137	Barnegat High School	Class C210		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
138	Barnegat High School	Stairs		3,860	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
139	Barnegat High School	Stairs		3,860	0	0	0	0	0			0
140	Barnegat High School	Stairs		3,860	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
141	Barnegat High School	Girls Room		2,000	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
142	Barnegat High School	Girls Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
143	Barnegat High School	Girls Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
144	Barnegat High School	Class C209A		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
145	Barnegat High School	Faculty Bathroom		2,000	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
146	Barnegat High School	Janitor Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
147	Barnegat High School	Boys Room		2,000	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
148	Barnegat High School	Boys Room		2,000	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
149	Barnegat High School	Boys Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
150	Barnegat High School	Mechanical M5		1,500	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
151	Barnegat High School	Class C209		1,500	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
152	Barnegat High School	S17 Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
153	Barnegat High School	Class C208		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
154	Barnegat High School	Class C207		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
155	Barnegat High School	Class C205		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
156	Barnegat High School	Class C206		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
157	Barnegat High School	Class C203		1,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
158	Barnegat High School	Class C204		1,500	14	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
159	Barnegat High School	Prep Room		1,500	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
160	Barnegat High School	Class C202		1,500	14	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
161	Barnegat High School	S16 Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
162	Barnegat High School	Stairs #4		3,860	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
163	Barnegat High School	Stairs #4		3,860	0	0	0	0	0			0
164	Barnegat High School	Stairs #4		3,860	2	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
165	Barnegat High School	Class C201		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
166	Barnegat High School	Girls Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
167	Barnegat High School	Girls Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
168	Barnegat High School	Girls Room		2,000	1	COMPACT FLUORESCENT 23W HW	23	0	0			0
169	Barnegat High School	Faculty Bathroom		2,000	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
170	Barnegat High School	Boys Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
171	Barnegat High School	Boys Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
172	Barnegat High School	Boys Room		2,000	1	COMPACT FLUORESCENT 23W HW	23	0	0			0
173	Barnegat High School	South Stairs		3,860	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
174	Barnegat High School	South Stairs		3,860	0	0	0	0	0			0
175	Barnegat High School	South Stairs		3,860	2	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
176	Barnegat High School	Class A204		1,500	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
177	Barnegat High School	S11 Storage		800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
178	Barnegat High School	Class A200		1,500	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
179	Barnegat High School	Class A202		1,500	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
180	Barnegat High School	Class A201		1,500	10	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
181	Barnegat High School	Class A203		1,500	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
182	Barnegat High School	Class A205		1,500	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
183	Barnegat High School	Class A205A		1,500	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
184	Barnegat High School	Class A207		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
185	Barnegat High School	Class A209		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
186	Barnegat High School	Class A208		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
187	Barnegat High School	S-15 Storage		800	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
188	Barnegat High School	Class A210		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0

CUSTOMER: Barnegat Township School Dist CUSTOMER: Barnegat Township School District

LOCATION: LOCATION:

City, State, Zip Code: City, State, Zip Code: 0

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GreenTech Energy Services

LIGHTING CONTROL

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
189	Barnegat High School	Class A212		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
190	Barnegat High School	Class A211		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
191	Barnegat High School	Class A213		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
192	Barnegat High School	EC2 Electrical		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
193	Barnegat High School	Data Room		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
194	Barnegat High School	Class A214		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
195	Barnegat High School	North Stairs		3,860	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
196	Barnegat High School	North Stairs		3,860	0	0	0	0	0			0
197	Barnegat High School	2nd Floor Hallways		3,860	46	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
198	Barnegat High School	2nd Floor Hallways - Large Sa		3,860	2	EXISTING DECORATIVE FIXTURES	0	0	0			0
199	Barnegat High School	1ST FLOOR CONTINUED			0	0	0	0	0			0
200	Barnegat High School	Class B110		1,500	34	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
201	Barnegat High School	B108A		1,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
202	Barnegat High School	Class B108		1,500	34	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
203	Barnegat High School	Class B106		1,500	20	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
204	Barnegat High School	B106 Office		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
205	Barnegat High School	B106 Studio		1,800	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
206	Barnegat High School	Class B104		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
207	Barnegat High School	Hallway Recessed Cans		3,860	41	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
208	Barnegat High School	Mens Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
209	Barnegat High School	Mens Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
210	Barnegat High School	Mens Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
211	Barnegat High School	JC2 Closet		400	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
212	Barnegat High School	Ladies Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
213	Barnegat High School	Ladies Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
214	Barnegat High School	Ladies Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
215	Barnegat High School	Faculty Room		2,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
216	Barnegat High School	Elevator Room		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
217	Barnegat High School	Electrical Room		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
218	Barnegat High School	Data Room #4		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
219	Barnegat High School	Class A110		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
220	Barnegat High School	S12 Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
221	Barnegat High School	Ladies Room		2,000	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
222	Barnegat High School	Ladies Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
223	Barnegat High School	Ladies Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
224	Barnegat High School	Ladies Room		2,000	3	RETROFIT 3' 3L LED TUBE / SELF BALLA	30	0	0			0
225	Barnegat High School	Faculty Bathroom		2,000	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
226	Barnegat High School	Janitor		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
227	Barnegat High School	Boys Room		2,000	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
228	Barnegat High School	Boys Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
229	Barnegat High School	Boys Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
230	Barnegat High School	Boys Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
231	Barnegat High School	S3 Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
232	Barnegat High School	Class A101 Storage		800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
233	Barnegat High School	Kiln Room		800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
234	Barnegat High School	A102 Storage		800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
235	Barnegat High School	A102 Display		800	2	RETROFIT 3' 1L LED TUBE / SELF BALLA	10	0	0			0

CUSTOMER: Barnegat Township School Distı **CUSTOMER:** Barnegat Township School District

LOCATION: **LOCATION:**

City, State, Zip Code: **City, State, Zip Code:** 0

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GreenTech Energy Services

LIGHTING CONTROL

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
236	Barnegat High School	Data Closet		800	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
237	Barnegat High School	Class C110		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
238	Barnegat High School	Class C109A		1,500	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
239	Barnegat High School	Girls Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
240	Barnegat High School	Girls Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
241	Barnegat High School	Girls Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
242	Barnegat High School	Faculty Bathroom		2,000	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
243	Barnegat High School	Janitor		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
244	Barnegat High School	Boys Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
245	Barnegat High School	Boys Room		2,000	2	RETROFIT 3' 2L LED TUBE / SELF BALLA	20	0	0			0
246	Barnegat High School	Boys Room		2,000	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
247	Barnegat High School	Boys Room		2,000	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
248	Barnegat High School	Class C109		1,500	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
249	Barnegat High School	Mechanical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
250	Barnegat High School	Hall Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
251	Barnegat High School	Class C108		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
252	Barnegat High School	Class C107		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
253	Barnegat High School	Class C105		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
254	Barnegat High School	Class C106		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
255	Barnegat High School	Class C103		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
256	Barnegat High School	Class C104		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
257	Barnegat High School	Prep Room		1,500	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
258	Barnegat High School	Class C102		1,500	14	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
259	Barnegat High School	Class C101		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
260	Barnegat High School	Hallways		3,860	57	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
261	Barnegat High School	Hallways - Large Salad Bowls		3,860	2	EXISTING DECORATIVE FIXTURES	0	0	0			0
262	Barnegat High School	Football Building		3,000	25	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
263	Barnegat High School	Football Building		3,000	6	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
264	Barnegat High School	Bathroom		3,860	2	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
265	Barnegat High School	Bathroom		3,860	2	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
266	Barnegat High School	Office		2,500	2	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
267	Barnegat High School	Mop Closet		400	1	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
268	Barnegat High School	Hallway Emergency Ballast		3,860	0	0	0	0	0			0
269	Barnegat High School	Exterior Lighting			0	0	0	0	0			0
270	Barnegat High School	Main Canopies		4,380	6	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
271	Barnegat High School	Main Canopies		4,380	6	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
272	Barnegat High School	Main Canopies		4,380	8	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
273	Barnegat High School	Full Face Wall Packs		4,380	29	NEW LED WALL PACK 20 WATT	20	0	0			0
274	Barnegat High School	Wall Mount Floods		4,380	18	NEW LED FLOOD 52 WATT	52	0	0			0
275	Barnegat High School	PL Wall Packs		4,380	8	NEW LED WALL PACK 20 WATT	20	0	0			0
276	Barnegat High School	Cutoff Wall Packs		4,380	23	NEW LED WALL PACK 20 WATT	20	0	0			0
277	Barnegat High School	Shoe Box Pole Lights		4,380	79	NEW LED SHOEBOX LOT 100 WATT ARN	100	0	0			0
278	Barnegat High School	(13) LED Wall Packs			0	0	0	0	0			0
279	Barnegat High School	FOOTBALL BUILDING EXTEF			0	0	0	0	0			0
280	Barnegat High School	Wall Mount Floods		4,380	2	NEW LED FLOOD 14 WATT	14	0	0			0
281	Barnegat High School	Cutoff Wall Packs		4,380	1	NEW LED WALL PACK 20 WATT	20	0	0			0
282	Barnegat High School	#1 Courtyard Wall Packs		4,380	4	NEW LED WALL PACK 20 WATT	20	0	0			0

CUSTOMER: Barnegat Township School Dist **CUSTOMER:** Barnegat Township School District

GreenTech Energy Services

LIGHTING CONTROL

LOCATION: **LOCATION:**

City, State, Zip Code: **City, State, Zip Code:** 0

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	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
283	Barnegat High School	#2 Courtyard Wall Packs		4,380	6	NEW LED WALL PACK 20 WATT	20	0	0			0
284	Barnegat High School	#2 Courtyard Wall Packs		4,380	2	NEW LED WALL PACK 20 WATT	20	0	0			0
285	Barnegat High School				0	0	0	0	0			0
286	Barnegat High School				0	0	0	0	0			0
	Total: Barnegat High School		**Total: Barnegat High School**		**2,057**			**0**			**0**	**0**

CUSTOMER: Barnegat Township School Dist **CUSTOMER:** Barnegat Township School District *GreenTech Energy Services*
LOCATION: **LOCATION:** **LIGHTING CONTROL**
City, State, Zip Code: **City, State, Zip Code:** 0
0
0

	LOCATION:			EXISTING LIGHTING CONTROL				PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
1	Russell O Brackman Middle School	Main Entry		3,860	2	NEW LED CANOPY 21 WATT	21	0	0			0
2	Russell O Brackman Middle School	Main Entry		3,860	4	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
3	Russell O Brackman Middle School	Lobby Area		3,860	8	RETROFIT HIGH HAT 12 WATT LED 4 IN(	12	0	0			0
4	Russell O Brackman Middle School	Lobby Area		3,860	1	NEW LED CANOPY 21 WATT	21	0	0			0
5	Russell O Brackman Middle School	Lobby Area - Salad Bowl		3,860	1	EXISTING DECORATIVE FIXTURES	0	0	0			0
6	Russell O Brackman Middle School	Display Cases		3,860	6	RETROFIT 3' 1L LED TUBE / SELF BALLA	10	0	0			0
7	Russell O Brackman Middle School	Main Office		2,500	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
8	Russell O Brackman Middle School	Main Office		2,500	8	RETROFIT HIGH HAT 12 WATT LED 4 IN(	12	0	0			0
9	Russell O Brackman Middle School	Mail Room		2,500	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	76
10	Russell O Brackman Middle School	Mail Room		2,500	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
11	Russell O Brackman Middle School	Principals Office		2,500	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	76
12	Russell O Brackman Middle School	Hall/Pantry		2,500	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
13	Russell O Brackman Middle School	Hall/Pantry		2,500	4	RETROFIT HIGH HAT 12 WATT LED 4 IN(	12	0	0			0
14	Russell O Brackman Middle School	Bathroom		3,860	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
15	Russell O Brackman Middle School	Asst. Principal		2,500	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	101
16	Russell O Brackman Middle School	Asst. Principal		2,500	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	101
17	Russell O Brackman Middle School	Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
18	Russell O Brackman Middle School	File Room		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	50
19	Russell O Brackman Middle School	Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	50
20	Russell O Brackman Middle School	Conference Room		2,500	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	2	WALL SENSOR	32%	1,700	101
21	Russell O Brackman Middle School	Stair #1		3,860	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
22	Russell O Brackman Middle School	Stair #1 - New LED			0	0	0	0	0			0
23	Russell O Brackman Middle School	2ND FLOOR WEST			0	0	0	0	0			0
24	Russell O Brackman Middle School	Storage Room		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
25	Russell O Brackman Middle School	Boys		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	104
26	Russell O Brackman Middle School	Boys		3,860	1	RETROFIT HIGH HAT 12 WATT LED 4 IN(	12	0	0			0
27	Russell O Brackman Middle School	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
28	Russell O Brackman Middle School	Girls Room		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	104
29	Russell O Brackman Middle School	Girls Room		3,860	1	RETROFIT HIGH HAT 12 WATT LED 4 IN(	12	0	0			0
30	Russell O Brackman Middle School	Class W201		1,500	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
31	Russell O Brackman Middle School	Prep Room		2,200	9	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
32	Russell O Brackman Middle School	Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
33	Russell O Brackman Middle School	Class W203		1,500	21	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
34	Russell O Brackman Middle School	Class W200		1,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
35	Russell O Brackman Middle School	Class W202		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
36	Russell O Brackman Middle School	Class W204		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
37	Russell O Brackman Middle School	Class W205		1,500	20	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
38	Russell O Brackman Middle School	Prep Room		1,500	9	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
39	Russell O Brackman Middle School	Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
40	Russell O Brackman Middle School	Class W207		1,500	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
41	Russell O Brackman Middle School	Class W206		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
42	Russell O Brackman Middle School	Class W208		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
43	Russell O Brackman Middle School	Stairs 2		3,860	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
44	Russell O Brackman Middle School	Electrical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
45	Russell O Brackman Middle School	Class N209		1,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
46	Russell O Brackman Middle School	Hall Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
47	Russell O Brackman Middle School	Class N210		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,020	121
48	Russell O Brackman Middle School	Girls Room		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	78
49	Russell O Brackman Middle School	Girls Room		3,860	2	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
50	Russell O Brackman Middle School	Boys Room		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	78
51	Russell O Brackman Middle School	Boys Room		3,860	2	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
52	Russell O Brackman Middle School	Storage/Elec.		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
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53	Russell O Brackman Middle School	Class N212		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
54	Russell O Brackman Middle School	Class N211		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
55	Russell O Brackman Middle School	N314/N214		2,200	16	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
56	Russell O Brackman Middle School	Class N213		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
57	Russell O Brackman Middle School	Class N216		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
58	Russell O Brackman Middle School	Class N215		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
59	Russell O Brackman Middle School	Class N218		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
60	Russell O Brackman Middle School	Class N217		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
61	Russell O Brackman Middle School	Faculty Room N220		2,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,700	101
62	Russell O Brackman Middle School	Faculty Room N220		2,500	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
63	Russell O Brackman Middle School	Class 219		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
64	Russell O Brackman Middle School	Custodian Closet		400	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
65	Russell O Brackman Middle School	Class N221		2,200	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	266
66	Russell O Brackman Middle School	N221 Storage		800	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
67	Russell O Brackman Middle School	Class N222		2,200	20	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	296
68	Russell O Brackman Middle School	N222 Prep		2,200	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,496	59
69	Russell O Brackman Middle School	Electrical Room		1,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
70	Russell O Brackman Middle School	Hall Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
71	Russell O Brackman Middle School	Center Stairs		3,860	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
72	Russell O Brackman Middle School	Center Stairs		3,860	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
73	Russell O Brackman Middle School	Class S223		2,200	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	266
74	Russell O Brackman Middle School	S223 Kiln		800	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
75	Russell O Brackman Middle School	Class S225		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
76	Russell O Brackman Middle School	Class S224		2,200	20	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	296
77	Russell O Brackman Middle School	S224 Prep		2,200	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,496	59
78	Russell O Brackman Middle School	Class S227		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
79	Russell O Brackman Middle School	Class S226		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
80	Russell O Brackman Middle School	Class S229		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
81	Russell O Brackman Middle School	Class S228		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
82	Russell O Brackman Middle School	Class S231A		2,200	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,496	74
83	Russell O Brackman Middle School	HALLS - SOME 3RD LAMP		3,860	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
84	Russell O Brackman Middle School	Class 231B		2,200	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	118
85	Russell O Brackman Middle School	Class S230		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
86	Russell O Brackman Middle School	Class S233		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
87	Russell O Brackman Middle School	Class S232		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
88	Russell O Brackman Middle School	Electrical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
89	Russell O Brackman Middle School	Boys Room		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	78
90	Russell O Brackman Middle School	Boys Room		3,860	2	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
91	Russell O Brackman Middle School	Girls Room		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	78
92	Russell O Brackman Middle School	Girls Room		3,860	2	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
93	Russell O Brackman Middle School	Class S234		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
94	Russell O Brackman Middle School	Hall Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
95	Russell O Brackman Middle School	Class S235		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
96	Russell O Brackman Middle School	Hallways		3,860	48	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
97	Russell O Brackman Middle School	Hallways		3,860	16	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
98	Russell O Brackman Middle School	1ST FLOOR			0	0	0	0	0			0
99	Russell O Brackman Middle School	Main Hallways		3,860	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
100	Russell O Brackman Middle School	Main Hallways		3,860	49	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
101	Russell O Brackman Middle School	Main Hallways		3,860	16	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
102	Russell O Brackman Middle School	Library		2,500	51	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
103	Russell O Brackman Middle School	Library		2,500	5	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
104	Russell O Brackman Middle School	Displays		2,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
105	Russell O Brackman Middle School	Library Work Room		2,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,700	101

Line Ref	LOCATION: Building	Location	EXISTING LIGHTING CONTROL: EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	PROPOSED LIGHTING CONTROLS: Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
106	Russell O Brackman Middle School	Office		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,700	50
107	Russell O Brackman Middle School	Elevator Room		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
108	Russell O Brackman Middle School	Room C127		1,500	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,020	50
109	Russell O Brackman Middle School	Guidance		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
110	Russell O Brackman Middle School	Services		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,700	50
111	Russell O Brackman Middle School	Office #1		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
112	Russell O Brackman Middle School	Office #2		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
113	Russell O Brackman Middle School	Office #3		2,500	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
114	Russell O Brackman Middle School	Nurse Suite		2,500	11	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
115	Russell O Brackman Middle School	Nurse Suite		2,500	6	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
116	Russell O Brackman Middle School	Class C123		2,200	16	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	473
117	Russell O Brackman Middle School	Elevator		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
118	Russell O Brackman Middle School	Ladies Room		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
119	Russell O Brackman Middle School	Ladies Room		3,860	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
120	Russell O Brackman Middle School	Class E145		2,200	16	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	473
121	Russell O Brackman Middle School	Boys Room		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
122	Russell O Brackman Middle School	Class E146		1,500	16	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,020	161
123	Russell O Brackman Middle School	E146 Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
124	Russell O Brackman Middle School	E146 Office		2,500	1	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
125	Russell O Brackman Middle School	E146 Office		2,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
126	Russell O Brackman Middle School	E146 Office		2,500	1	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
127	Russell O Brackman Middle School	Display		3,860	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
128	Russell O Brackman Middle School	Music E147		1,500	14	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
129	Russell O Brackman Middle School	E147 Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
130	Russell O Brackman Middle School	Sound Booth		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
131	Russell O Brackman Middle School	Room E148		1,500	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,020	91
132	Russell O Brackman Middle School	(2) Bathrooms		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
133	Russell O Brackman Middle School	Class E148		2,200	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,496	177
134	Russell O Brackman Middle School	Class E149		2,200	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
135	Russell O Brackman Middle School	Class E150		2,200	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
136	Russell O Brackman Middle School	Class E151		2,200	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,496	44
137	Russell O Brackman Middle School	Class E152		2,200	5	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,496	111
138	Russell O Brackman Middle School	Facilities		2,500	22	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
139	Russell O Brackman Middle School	Electrical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
140	Russell O Brackman Middle School	High Voltage		1,500	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
141	Russell O Brackman Middle School	Boiler Room		1,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
142	Russell O Brackman Middle School	Mens Room		3,860	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
143	Russell O Brackman Middle School	Mens Room		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
144	Russell O Brackman Middle School	Custodian Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
145	Russell O Brackman Middle School	Main Gym Entries		3,860	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
146	Russell O Brackman Middle School	Storage - New LED			0	0	0	0	0			0
147	Russell O Brackman Middle School	Main Gym		3,000	24	RETROFIT 4' 4L T5 LED TUBE / SELF BAL	100	0	0			0
148	Russell O Brackman Middle School	Main Gym		3,000	4	RETROFIT 4' 2L T5 LED TUBE / SELF BAL	50	0	0			0
149	Russell O Brackman Middle School	Boys Lockers		3,000	14	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
150	Russell O Brackman Middle School	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
151	Russell O Brackman Middle School	Showers		3,000	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
152	Russell O Brackman Middle School	Office		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
153	Russell O Brackman Middle School	Office		2,500	2	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
154	Russell O Brackman Middle School	Girls Lockers		3,000	14	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
155	Russell O Brackman Middle School	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
156	Russell O Brackman Middle School	Shower		3,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
157	Russell O Brackman Middle School	Office		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
158	Russell O Brackman Middle School	Office		2,500	2	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
159	Russell O Brackman Middle School	Storage Room		800	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
160	Russell O Brackman Middle School	Loft		800	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
161	Russell O Brackman Middle School	Band G154		1,500	36	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
162	Russell O Brackman Middle School	Girls Room		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	52
163	Russell O Brackman Middle School	Girls Room		3,860	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
164	Russell O Brackman Middle School	Weight Room		3,000	24	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
165	Russell O Brackman Middle School	Weight Room		3,000	2	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
166	Russell O Brackman Middle School	Side Room		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
167	Russell O Brackman Middle School	Display		3,860	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
168	Russell O Brackman Middle School	Kitchen		2,000	22	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
169	Russell O Brackman Middle School	Kitchen		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
170	Russell O Brackman Middle School	Stove Hoods		2,000	4	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
171	Russell O Brackman Middle School	Office		2,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
172	Russell O Brackman Middle School	Dry Storage		800	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
173	Russell O Brackman Middle School	Coolers		800	4	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
174	Russell O Brackman Middle School	Bathroom		3,860	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
175	Russell O Brackman Middle School	Cafeteria		2,500	50	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
176	Russell O Brackman Middle School	Gym #2 - New LED			0	0	0	0	0			0
177	Russell O Brackman Middle School	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
178	Russell O Brackman Middle School	Gym Storage		800	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
179	Russell O Brackman Middle School	Mechanical Room		1,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
180	Russell O Brackman Middle School	M132		2,200	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,496	59
181	Russell O Brackman Middle School	M131		2,200	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,496	59
182	Russell O Brackman Middle School	Boys Room		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	78
183	Russell O Brackman Middle School	Boys Room		3,860	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
184	Russell O Brackman Middle School	Room 130/129		2,200	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
185	Russell O Brackman Middle School	Girls Room		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	78
186	Russell O Brackman Middle School	Girls Room		3,860	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
187	Russell O Brackman Middle School	Room M128		2,200	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
188	Russell O Brackman Middle School	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
189	Russell O Brackman Middle School	Electrical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
190	Russell O Brackman Middle School	Class S134		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
191	Russell O Brackman Middle School	Class S135		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
192	Russell O Brackman Middle School	Class S136		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
193	Russell O Brackman Middle School	Class S137		2,200	22	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	325
194	Russell O Brackman Middle School	Class S138		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
195	Russell O Brackman Middle School	Class S140		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
196	Russell O Brackman Middle School	Mechanical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
197	Russell O Brackman Middle School	Faculty S142		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
198	Russell O Brackman Middle School	Faculty S142		2,500	3	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
199	Russell O Brackman Middle School	Stairs		3,860	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
200	Russell O Brackman Middle School	Stairs		3,860	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
201	Russell O Brackman Middle School	Room S141		2,200	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,496	89
202	Russell O Brackman Middle School	Room S143		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
203	Russell O Brackman Middle School	Room S144		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
204	Russell O Brackman Middle School	NORTH WING			0	0	0	0	0			0
205	Russell O Brackman Middle School	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
206	Russell O Brackman Middle School	Electrical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
207	Russell O Brackman Middle School	Class N121		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
208	Russell O Brackman Middle School	Class N122		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
209	Russell O Brackman Middle School	Class N119		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
210	Russell O Brackman Middle School	Class N120		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
211	Russell O Brackman Middle School	Class N117		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
212	Russell O Brackman Middle School	Class N118		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
213	Russell O Brackman Middle School	Class N115		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
214	Russell O Brackman Middle School	Electrical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
215	Russell O Brackman Middle School	Class N113		2,200	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
216	Russell O Brackman Middle School	Class N114		2,200	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,496	89
217	Russell O Brackman Middle School	Class N112		2,200	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	177
218	Russell O Brackman Middle School	Stairs		3,860	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
219	Russell O Brackman Middle School	Stairs		3,860	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
220	Russell O Brackman Middle School	Boys Room		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	104
221	Russell O Brackman Middle School	Boys Room		3,860	1	RETROFIT HIGH HAT 12 WATT LED 4 IN	12	0	0			0
222	Russell O Brackman Middle School	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
223	Russell O Brackman Middle School	Girls Room		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CEILING MOUNT SENSOR 1, SWITCH 1	32%	2,625	104
224	Russell O Brackman Middle School	Girls Room		3,860	1	RETROFIT HIGH HAT 12 WATT LED 4 IN	12	0	0			0
225	Russell O Brackman Middle School	Class W101		1,500	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
226	Russell O Brackman Middle School	Prep Room		2,200	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
227	Russell O Brackman Middle School	Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
228	Russell O Brackman Middle School	Class W103		1,500	21	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
229	Russell O Brackman Middle School	Book Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
230	Russell O Brackman Middle School	Server Room		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
231	Russell O Brackman Middle School	Class W102		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
232	Russell O Brackman Middle School	Class W104		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
233	Russell O Brackman Middle School	Class W105		1,500	21	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
234	Russell O Brackman Middle School	Prep Room		2,200	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
235	Russell O Brackman Middle School	Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
236	Russell O Brackman Middle School	Class W107		1,500	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
237	Russell O Brackman Middle School	Class W106		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
238	Russell O Brackman Middle School	Class W108		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
239	Russell O Brackman Middle School	Class W109		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
240	Russell O Brackman Middle School	Class W110		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
241	Russell O Brackman Middle School	Electrical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
242	Russell O Brackman Middle School	Courtyard		4,380	2	NEW LED SHOEBOX LOT 100 WATT ARM	100	0	0			0
243	Russell O Brackman Middle School	Courtyard		4,380	2	NEW LED WALL PACK 20 WATT	20	0	0			0
244	Russell O Brackman Middle School	N111 Room		2,200	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
245	Russell O Brackman Middle School	Auditorium Electrical Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
246	Russell O Brackman Middle School	Side Room		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
247	Russell O Brackman Middle School	Possible Emergency Ballast		3,860	0	0	0	0	0			0
248	Russell O Brackman Middle School	EXTERIOR			0	0	0	0	0			0
249	Russell O Brackman Middle School	Shoe Box Pole Lights		4,380	27	NEW LED SHOEBOX LOT 100 WATT ARM	100	0	0			0
250	Russell O Brackman Middle School	Wall Mount Shoe Box Fixtures		4,380	11	NEW LED SHOEBOX LOT 100 WATT ARM	100	0	0			0
251	Russell O Brackman Middle School	Front Canopy		4,380	4	RETROFIT HIGH HAT 12 WATT LED 4 IN	12	0	0			0
252	Russell O Brackman Middle School	Surf Mount Box Fixture		4,380	5	NEW LED CANOPY 21 WATT	21	0	0			0
253	Russell O Brackman Middle School	Half Dome Wall Packs		4,380	11	NEW LED WALL PACK 20 WATT	20	0	0			0
254	Russell O Brackman Middle School	Full Face Wall Packs		4,380	1	NEW LED WALL PACK 20 WATT	20	0	0			0
	Total: Russell O Brackman Middle School		**Total: Russell O Brackman Middle School**		**1,872**			**78**			**127,949**	**11,402**

CUSTOMER: Barnegat Township School Dist **CUSTOMER:** Barnegat Township School District

LOCATION: **LOCATION:**

City, State, Zip Code: **City, State, Zip Code:** 0

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GreenTech Energy Services

LIGHTING CONTROL

LOCATION:			EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
1	Robert L Horbelt School	Main Entry		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
2	Robert L Horbelt School	Main Lobby		3,860	16	RETROFIT HIGH HAT 12 WATT LED 8 IN	12	0	0			0
3	Robert L Horbelt School	Main Lobby		3,860	14	RETROFIT HIGH HAT 12 WATT LED 8 IN	12	0	0			0
4	Robert L Horbelt School	Class 500		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,020	121
5	Robert L Horbelt School	Stage		2,500	12	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
6	Robert L Horbelt School	Stage Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
7	Robert L Horbelt School	Boys Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
8	Robert L Horbelt School	Girls Room		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
9	Robert L Horbelt School	Hall Storage		800	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
10	Robert L Horbelt School	Main Gym		3,000	24	RETROFIT 4' 3L T5 LED TUBE / SELF BAL	75	0	0			0
11	Robert L Horbelt School	Gym Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
12	Robert L Horbelt School	Storage Room		800	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
13	Robert L Horbelt School	Storage Room		800	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
14	Robert L Horbelt School	Music Room		2,200	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
15	Robert L Horbelt School	Music Room		2,200	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
16	Robert L Horbelt School	Music Office		2,500	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
17	Robert L Horbelt School	Gym Lobby		3,860	15	RETROFIT HIGH HAT 12 WATT LED 8 IN	12	0	0			0
18	Robert L Horbelt School	Gym Lobby		3,860	11	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
19	Robert L Horbelt School	Side Entry		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
20	Robert L Horbelt School	Cafeteria		2,500	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
21	Robert L Horbelt School	Cafeteria		2,500	36	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
22	Robert L Horbelt School	Serving		2,000	6	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
23	Robert L Horbelt School	Custodian Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
24	Robert L Horbelt School	Kitchen Bathroom		3,860	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
25	Robert L Horbelt School	Kitchen Area		2,000	10	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
26	Robert L Horbelt School	Kitchen Area		2,000	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
27	Robert L Horbelt School	Kitchen Office		2,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
28	Robert L Horbelt School	Custodian Office		2,500	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
29	Robert L Horbelt School	Mechanical Room		1,500	11	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
30	Robert L Horbelt School	Coolers		800	4	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
31	Robert L Horbelt School	Dry Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
32	Robert L Horbelt School	Stove Hood		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
33	Robert L Horbelt School	Cafeteria Storage		800	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
34	Robert L Horbelt School	Main Office		1,800	11	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
35	Robert L Horbelt School	Bathroom		3,860	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
36	Robert L Horbelt School	Conference Room		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
37	Robert L Horbelt School	Copier Room		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
38	Robert L Horbelt School	Office #1		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
39	Robert L Horbelt School	Office #2		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
40	Robert L Horbelt School	Storage		800	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
41	Robert L Horbelt School	Nurse Suite		1,800	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
42	Robert L Horbelt School	Nurse Suite		1,800	4	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
43	Robert L Horbelt School	Bathroom		3,860	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
44	Robert L Horbelt School	(2) Bathroom		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
45	Robert L Horbelt School	Mechanical Room		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
46	Robert L Horbelt School	Lobby Area		3,860	14	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
47	Robert L Horbelt School	Faculty Room		1,800	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
48	Robert L Horbelt School	Faculty Room		1,800	5	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0
49	Robert L Horbelt School	Elevator		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
50	Robert L Horbelt School	Class 500A		1,500	5	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
51	Robert L Horbelt School	Electrical Closet		1,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
52	Robert L Horbelt School	Hallway		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
53	Robert L Horbelt School	Hallway		3,860	1	RETROFIT HIGH HAT 12 WATT LED 6 IN	12	0	0			0

CUSTOMER: **Barnegat Township School Disti** **CUSTOMER:** **Barnegat Township School District**
LOCATION: **LOCATION:**
City, State, Zip Code: **City, State, Zip Code:** 0
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GreenTech Energy Services
LIGHTING CONTROL

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
54	Robert L Horbelt School	Girls Room		2,000	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
55	Robert L Horbelt School	Boys Room		2,000	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
56	Robert L Horbelt School	Custodian Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
57	Robert L Horbelt School	Class 500B		1,500	7	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
58	Robert L Horbelt School	Hall Cove		3,860	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
59	Robert L Horbelt School	Class 501		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
60	Robert L Horbelt School	Class 501		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
61	Robert L Horbelt School	Class 502		1,500	13	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
62	Robert L Horbelt School	Class 502		1,500	7	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
63	Robert L Horbelt School	Bathroom		2,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
64	Robert L Horbelt School	Class 504		1,500	13	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
65	Robert L Horbelt School	Class 504		1,500	7	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
66	Robert L Horbelt School	Class 504		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
67	Robert L Horbelt School	Class 503		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
68	Robert L Horbelt School	Class 503		1,500	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
69	Robert L Horbelt School	503 Storage		800	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
70	Robert L Horbelt School	503 Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
71	Robert L Horbelt School	Hallway		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
72	Robert L Horbelt School	Class 505A		2,200	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,496	67
73	Robert L Horbelt School	Hall Cove		3,860	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
74	Robert L Horbelt School	Class 505A		1,500	24	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
75	Robert L Horbelt School	Class 505A		1,500	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
76	Robert L Horbelt School	Class 506		1,500	13	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
77	Robert L Horbelt School	Class 506		1,500	7	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
78	Robert L Horbelt School	Class 506		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
79	Robert L Horbelt School	Class 508		1,500	13	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
80	Robert L Horbelt School	Class 508		1,500	7	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
81	Robert L Horbelt School	Class 508		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
82	Robert L Horbelt School	Class 507		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
83	Robert L Horbelt School	Class 507		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
84	Robert L Horbelt School	Hallway		3,860	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
85	Robert L Horbelt School	Hallway		3,860	8	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
86	Robert L Horbelt School	Class 509/509B		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
87	Robert L Horbelt School	Class 510/510B		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
88	Robert L Horbelt School	Class 512		1,500	13	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,020	131
89	Robert L Horbelt School	512 Bathroom		2,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
90	Robert L Horbelt School	Class 511		2,200	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	222
91	Robert L Horbelt School	Hallway		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
92	Robert L Horbelt School	Class 513		2,200	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	222
93	Robert L Horbelt School	Class 514		1,500	13	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
94	Robert L Horbelt School	Class 514		1,500	1	NEW 2X2 LED FLAT PANEL FIXTURE 40	40	0	0			0
95	Robert L Horbelt School	514 Bathroom		2,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
96	Robert L Horbelt School	Hallway		3,860	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
97	Robert L Horbelt School	Hallway		3,860	5	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
98	Robert L Horbelt School	Ladies Room		2,000	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
99	Robert L Horbelt School	Electrical Room		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
100	Robert L Horbelt School	Electrical Room		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
101	Robert L Horbelt School	Boys Room		2,000	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
102	Robert L Horbelt School	Class 515		2,200	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	222
103	Robert L Horbelt School	Class 516		1,500	9	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
104	Robert L Horbelt School	Stairwell		3,860	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
105	Robert L Horbelt School	Stairwell		3,860	0	0	0	0	0			0
106	Robert L Horbelt School	2ND FLOOR			0	0	0	0	0			0

CUSTOMER: **Barnegat Township School Dist** **CUSTOMER:** **Barnegat Township School District**
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GreenTech Energy Services
LIGHTING CONTROL

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
107	Robert L Horbelt School	Class 616		1,500	9	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
108	Robert L Horbelt School	Class 617		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
109	Robert L Horbelt School	Mens Room		2,000	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
110	Robert L Horbelt School	Hallway		3,860	24	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
111	Robert L Horbelt School	Hallway		3,860	20	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
112	Robert L Horbelt School	Hall Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
113	Robert L Horbelt School	Ladies Room		2,000	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
114	Robert L Horbelt School	Class 614		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
115	Robert L Horbelt School	Class 615		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
116	Robert L Horbelt School	Class 612		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
117	Robert L Horbelt School	Class 613		1,500	15	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
118	Robert L Horbelt School	Stair #3		3,860	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
119	Robert L Horbelt School	Stair #3		3,860	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
120	Robert L Horbelt School	Stair #2		3,860	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
121	Robert L Horbelt School	Stair #2		3,860	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
122	Robert L Horbelt School	Class 611		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
123	Robert L Horbelt School	Class 611		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
124	Robert L Horbelt School	Class 610		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
125	Robert L Horbelt School	Class 610		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
126	Robert L Horbelt School	Hall Cove		3,860	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
127	Robert L Horbelt School	Class 608		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
128	Robert L Horbelt School	Class 608		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
129	Robert L Horbelt School	Class 609		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
130	Robert L Horbelt School	Class 609		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
131	Robert L Horbelt School	Class 607		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
132	Robert L Horbelt School	Class 607		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
133	Robert L Horbelt School	Class 606		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
134	Robert L Horbelt School	Class 606		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
135	Robert L Horbelt School	Hall Cove		3,860	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
136	Robert L Horbelt School	Class 604		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
137	Robert L Horbelt School	Class 604		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
138	Robert L Horbelt School	Class 605		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
139	Robert L Horbelt School	Class 605		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
140	Robert L Horbelt School	Class 603		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
141	Robert L Horbelt School	Class 603		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
142	Robert L Horbelt School	Class 602		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
143	Robert L Horbelt School	Class 602		1,500	3	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
144	Robert L Horbelt School	Boys Room		2,000	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
145	Robert L Horbelt School	Ladies Room		2,000	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
146	Robert L Horbelt School	Class 601B/601		1,500	12	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
147	Robert L Horbelt School	Custodian Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
148	Robert L Horbelt School	Electrical Room		1,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
149	Robert L Horbelt School	(2) Faculty Bathrooms		2,000	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
150	Robert L Horbelt School	Class 600A		2,200	9	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,496	200
151	Robert L Horbelt School	600A Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
152	Robert L Horbelt School	Class 600		1,500	9	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
153	Robert L Horbelt School	Class 600		1,500	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
154	Robert L Horbelt School	Mechanical Room		1,500	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
155	Robert L Horbelt School	Library		2,500	28	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
156	Robert L Horbelt School	Library		2,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
157	Robert L Horbelt School	Library		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
158	Robert L Horbelt School	Work Room		1,800	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
159	Robert L Horbelt School	Storage Room		800	11	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
160	Robert L Horbelt School	Storage Room		800	1	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
161	Robert L Horbelt School	Stair #1		3,860	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
162	Robert L Horbelt School	Stair #1		3,860	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
163	Robert L Horbelt School	Possible Emergency Ballast			0	0	0	0	0			0
164	Robert L Horbelt School	EXTERIOR			0	0	0	0	0			0
165	Robert L Horbelt School	Main Canopy		4,380	4	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
166	Robert L Horbelt School	Main Canopy - Induction		4,380	5	NEW LED CANOPY 21 WATT	21	0	0			0
167	Robert L Horbelt School	Full Face Wall Packs - New LE			0	0	0	0	0			0
168	Robert L Horbelt School	Bell Top Pole Lights		4,380	17	RELAMP CORN STYLE 30W LED E26	20	0	0			0
169	Robert L Horbelt School	Bell Top Wall Mount Fixtures		4,380	7	NEW LED WALL PACK 20 WATT	20	0	0			0
170	Robert L Horbelt School	Cutoff Wall Packs		4,380	1	NEW LED WALL PACK 20 WATT	20	0	0			0
171	Robert L Horbelt School	Recessed Cans		4,380	2	RETROFIT HIGH HAT 12 WATT LED 6 IN(	12	0	0			0
	Total: Robert L Horbelt School		**Total: Robert L Horbelt School**		**1,127**			**7**			**9,520**	**1,183**

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
1	Joseph T Donahue Elementary School	2ND FLOOR			0	0	0	0	0			0
2	Joseph T Donahue Elementary School	Mechanical Room		1,500	14	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
3	Joseph T Donahue Elementary School	Faculty Room		2,500	9	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	CORNER MOUNT SENSOR 1, SWITCH	32%	1,700	151
4	Joseph T Donahue Elementary School	(2) Bathrooms		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
5	Joseph T Donahue Elementary School	2nd Floor Hallways		3,860	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
6	Joseph T Donahue Elementary School	Display		3,860	1	RETROFIT 3' 1L LED TUBE / SELF BALLA	10	0	0			0
7	Joseph T Donahue Elementary School	Class 207		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
8	Joseph T Donahue Elementary School	Class 206		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
9	Joseph T Donahue Elementary School	Class 205		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
10	Joseph T Donahue Elementary School	Class 204		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
11	Joseph T Donahue Elementary School	Class 203		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
12	Joseph T Donahue Elementary School	Class 202		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
13	Joseph T Donahue Elementary School	Class 201		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
14	Joseph T Donahue Elementary School	Class 200		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
15	Joseph T Donahue Elementary School	SGI 208		1,500	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
16	Joseph T Donahue Elementary School	Custodian		400	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
17	Joseph T Donahue Elementary School	Mens Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
18	Joseph T Donahue Elementary School	Ladies Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
19	Joseph T Donahue Elementary School	Stairs #1		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
20	Joseph T Donahue Elementary School	Stairs #2		3,860	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
21	Joseph T Donahue Elementary School	Elevator Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
22	Joseph T Donahue Elementary School	Elevator		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
23	Joseph T Donahue Elementary School	1ST FLOOR			0	0	0	0	0			0
24	Joseph T Donahue Elementary School	Hallway		3,860	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
25	Joseph T Donahue Elementary School	Display		3,860	1	RETROFIT 3' 1L LED TUBE / SELF BALLA	10	0	0			0
26	Joseph T Donahue Elementary School	Class 107		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
27	Joseph T Donahue Elementary School	Class 106		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
28	Joseph T Donahue Elementary School	Class 105		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
29	Joseph T Donahue Elementary School	Class 104		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
30	Joseph T Donahue Elementary School	Class 103		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
31	Joseph T Donahue Elementary School	Class 102		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
32	Joseph T Donahue Elementary School	Class 101		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
33	Joseph T Donahue Elementary School	Class 100		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
34	Joseph T Donahue Elementary School	SGI Room		1,500	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,020	81
35	Joseph T Donahue Elementary School	Girls Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
36	Joseph T Donahue Elementary School	Boys Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
37	Joseph T Donahue Elementary School	Custodian Closet		400	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
38	Joseph T Donahue Elementary School	Large Lobby		3,860	49	NEW 2X2 LED FLAT PANEL FIXTURE 40 \	40	0	0			0
39	Joseph T Donahue Elementary School	Large Lobby		3,860	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
40	Joseph T Donahue Elementary School	Mail Room		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
41	Joseph T Donahue Elementary School	Side Door		3,860	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
42	Joseph T Donahue Elementary School	Electrical Room		1,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
43	Joseph T Donahue Elementary School	Mens Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
44	Joseph T Donahue Elementary School	Custodian		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
45	Joseph T Donahue Elementary School	Girls Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
46	Joseph T Donahue Elementary School	Supply Room		800	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
47	Joseph T Donahue Elementary School	Class 123		1,500	18	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
48	Joseph T Donahue Elementary School	Class 122		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
49	Joseph T Donahue Elementary School	Main Gym		3,000	15	RETROFIT 4' 6L T5 LED TUBE / SELF BAL	150	0	0			0
50	Joseph T Donahue Elementary School	Main Gym		3,000	13	NEW LED FLOOD 14 WATT	14	0	0			0
51	Joseph T Donahue Elementary School	Gym Storage		800	8	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0

CUSTOMER: Barnegat Township School Dist CUSTOMER: Barnegat Township School District

GreenTech Energy Services

LIGHTING CONTROL

LOCATION: LOCATION:

City, State, Zip Code: City, State, Zip Code: 0

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	LOCATION:			EXISTING LIGHTING CONTROL				PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
52	Joseph T Donahue Elementary School	Stage - 8L Sports Light		2,500	13	NEW LED HIGH BAY 150 WATT	150	0	0			0
53	Joseph T Donahue Elementary School	Chair Lift		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
54	Joseph T Donahue Elementary School	Stage Storage		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
55	Joseph T Donahue Elementary School	Music 134A		1,500	17	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
56	Joseph T Donahue Elementary School	134A Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
57	Joseph T Donahue Elementary School	Gym Office		1,800	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
58	Joseph T Donahue Elementary School	Gym Office		1,800	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
59	Joseph T Donahue Elementary School	Bathroom		2,000	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
60	Joseph T Donahue Elementary School	Bathroom		2,000	1	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
61	Joseph T Donahue Elementary School	Library		2,500	6	NEW 2X2 LED FLAT PANEL FIXTURE 40	40	0	0			0
62	Joseph T Donahue Elementary School	Library		2,500	6	COMPACT FLUORESCENT 13W HW	13	0	0			0
63	Joseph T Donahue Elementary School	Library		2,500	52	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
64	Joseph T Donahue Elementary School	Library Office		1,800	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
65	Joseph T Donahue Elementary School	Book Storage		800	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
66	Joseph T Donahue Elementary School	Supply Room		800	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
67	Joseph T Donahue Elementary School	Library Cove Large - Salad Bo		2,500	1	0	0	0	0			0
68	Joseph T Donahue Elementary School	Lobby Display		3,860	1	RETROFIT 3' 1L LED TUBE / SELF BALLA	10	0	0			0
69	Joseph T Donahue Elementary School	Lobby Center		3,860	4	NEW LED FLOOD 14 WATT	14	0	0			0
70	Joseph T Donahue Elementary School	Cafeteria - 8L Sports Light		2,500	25	NEW LED HIGH BAY 150 WATT	150	0	0			0
71	Joseph T Donahue Elementary School	Receiving		2,000	10	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
72	Joseph T Donahue Elementary School	Food Serving		2,000	8	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
73	Joseph T Donahue Elementary School	Faculty Dining		1,800	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
74	Joseph T Donahue Elementary School	Kitchen		2,000	15	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
75	Joseph T Donahue Elementary School	Coolers		800	4	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
76	Joseph T Donahue Elementary School	Storage Room		800	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
77	Joseph T Donahue Elementary School	Ladies Room		2,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
78	Joseph T Donahue Elementary School	Kitchen Office		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
79	Joseph T Donahue Elementary School	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
80	Joseph T Donahue Elementary School	Stove Hoods		2,000	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
81	Joseph T Donahue Elementary School	Main Office		2,500	11	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
82	Joseph T Donahue Elementary School	Work Room		2,500	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
83	Joseph T Donahue Elementary School	Files Room		800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
84	Joseph T Donahue Elementary School	Conference Room		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
85	Joseph T Donahue Elementary School	Conference Room		2,500	6	RETROFIT HIGH HAT 12 WATT LED 8 IN	12	0	0			0
86	Joseph T Donahue Elementary School	Guidance		1,800	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
87	Joseph T Donahue Elementary School	Guidance		1,800	2	NEW 2X2 LED FLAT PANEL FIXTURE 40	40	0	0			0
88	Joseph T Donahue Elementary School	Principal		1,800	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
89	Joseph T Donahue Elementary School	Side Office		1,800	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
90	Joseph T Donahue Elementary School	Bathroom		3,860	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
91	Joseph T Donahue Elementary School	Speech Room		2,200	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,496	67
92	Joseph T Donahue Elementary School	Nurse Suite		1,800	8	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
93	Joseph T Donahue Elementary School	Nurse Suite		1,800	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
94	Joseph T Donahue Elementary School	Electrical Room		1,500	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
95	Joseph T Donahue Elementary School	Data Room		1,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
96	Joseph T Donahue Elementary School	Hallway		3,860	25	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
97	Joseph T Donahue Elementary School	Display		3,860	1	RETROFIT 3' 1L LED TUBE / SELF BALLA	10	0	0			0
98	Joseph T Donahue Elementary School	Class J		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
99	Joseph T Donahue Elementary School	Class A		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
100	Joseph T Donahue Elementary School	Class B		1,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
101	Joseph T Donahue Elementary School	Class C		1,500	14	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
102	Joseph T Donahue Elementary School	C Storage		800	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0

CUSTOMER: **Barnegat Township School Distr** **CUSTOMER:** **Barnegat Township School District**
LOCATION: **LOCATION:**
City, State, Zip Code: **City, State, Zip Code:**
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GreenTech Energy Services
LIGHTING CONTROL

	LOCATION:		**EXISTING LIGHTING CONTROL**					**PROPOSED LIGHTING CONTROLS**				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
103	Joseph T Donahue Elementary School	Class D		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
104	Joseph T Donahue Elementary School	Class D		1,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
105	Joseph T Donahue Elementary School	Class E		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
106	Joseph T Donahue Elementary School	Class E Bathroom		2,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
107	Joseph T Donahue Elementary School	Class F		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
108	Joseph T Donahue Elementary School	F Bathroom		2,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
109	Joseph T Donahue Elementary School	SGI Rooms		1,500	16	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
110	Joseph T Donahue Elementary School	Class G		1,500	14	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
111	Joseph T Donahue Elementary School	G Bath		2,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
112	Joseph T Donahue Elementary School	Faculty Room		1,800	9	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
113	Joseph T Donahue Elementary School	Bathroom		2,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
114	Joseph T Donahue Elementary School	Class I		1,500	12	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
115	Joseph T Donahue Elementary School	Boys Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
116	Joseph T Donahue Elementary School	Custodian Closet		400	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
117	Joseph T Donahue Elementary School	Girls Room		2,000	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
118	Joseph T Donahue Elementary School	Possible Emergency Ballast			0	0	0	0	0			0
119	Joseph T Donahue Elementary School	EXTERIOR			0	0	0	0	0			0
120	Joseph T Donahue Elementary School	Large Wall Sconces		4,380	8	EXISTING DECORATIVE FIXTURES	0	0	0			0
121	Joseph T Donahue Elementary School	Small Wall Sconces		4,380	24	EXISTING DECORATIVE FIXTURES	0	0	0			0
122	Joseph T Donahue Elementary School	Full Face Wall Packs		4,380	30	NEW LED WALL PACK 20 WATT	20	0	0			0
123	Joseph T Donahue Elementary School	Indirect Floods		4,380	4	RELAMP 20 WATT LED FLOOD S/I	20	0	0			0
124	Joseph T Donahue Elementary School	Shoe Box Pole Lights		4,380	27	NEW LED SHOEBOX LOT 100 WATT ARM	100	0	0			0
	Total: Joseph T Donahue Elementary School		**Total: Joseph T Donahue Elementary Schoo**		**986**			**3**			**4,216**	**298**

	LOCATION:		**EXISTING LIGHTING CONTROL**					**PROPOSED LIGHTING CONTROLS**				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
1	Administration Building	Main Entrance		2,500	3	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
2	Administration Building	Closet		400	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
3	Administration Building	Conference Room		2,500	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	2	WALL SENSOR	32%	1,700	151
4	Administration Building	Hallway		2,500	7	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
5	Administration Building	Side Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	50
6	Administration Building	Files Room		2,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
7	Administration Building	Reception Area		2,500	5	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
8	Administration Building	Side Office		2,500	6	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	151
9	Administration Building	Side Office		2,500	3	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	76
10	Administration Building	Side Office		2,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
11	Administration Building	(2) Bathrooms		2,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
12	Administration Building	Side Office		2,500	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
13	Administration Building	Cubical Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	50
14	Administration Building	Kitchen / Break Room		2,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
15	Administration Building	Side Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	50
16	Administration Building	Side Office		2,500	4	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	101
17	Administration Building	Side Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	50
18	Administration Building	Side Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	1	WALL SENSOR	32%	1,700	50
19	Administration Building	Cubical Office		2,500	1	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
20	Administration Building	Cubical Office		2,500	2	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
21	Administration Building	Main Receptionist Office		2,500	2	RETROFIT 4' 3L LED TUBE / SELF BALLA	32	0	0			0
	Total: Administration Building		**Total: Administration Building**		**61**			**10**			**15,300**	**731**

	LOCATION:		EXISTING LIGHTING CONTROL					PROPOSED LIGHTING CONTROLS				
Line Ref	Building	Location	EXISTING CONTROL	Existing Hrs. per Year	Lighting Qty	LIGHTING DESCRIPTION	WATT / Fixture	Control QTY	Control Description	Control Hours Reduced	New Hrs. (controlled)	KWH Saved from controls
1	Transportation / Buildings & Grounds	Warehouse		2,500	21	RETROFIT 8' 2L TO 4' 4 LED TUBE /SELF	42	0	0			0
2	Transportation / Buildings & Grounds	Warehouse Office		2,500	6	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	1,700	101
3	Transportation / Buildings & Grounds	Transportation & Grounds Offi		2,500	4	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
4	Transportation / Buildings & Grounds	Transportation & Grounds Offi		2,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
5	Transportation / Buildings & Grounds	Side Office		2,500	2	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	WALL SENSOR	32%	1,700	67
6	Transportation / Buildings & Grounds	Side Office		2,500	1	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	WALL SENSOR	32%	1,700	34
7	Transportation / Buildings & Grounds	Copier Room		2,500	1	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
8	Transportation / Buildings & Grounds	Side Office		2,500	1	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	WALL SENSOR	32%	1,700	34
9	Transportation / Buildings & Grounds	Mechanical Room		1,500	1	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
10	Transportation / Buildings & Grounds	Hallway		2,500	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
11	Transportation / Buildings & Grounds	Neil Piro's Office		2,500	1	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	WALL SENSOR	32%	1,700	34
12	Transportation / Buildings & Grounds	Supply Room		800	1	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
13	Transportation / Buildings & Grounds	Pantry		2,500	1	RETROFIT 2' 2L LED TUBE / SELF BALLA	14	0	0			0
14	Transportation / Buildings & Grounds	Bathroom		2,500	1	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
15	Transportation / Buildings & Grounds	Bus Garage		2,500	18	RETROFIT 8' 2L TO 4' 4 LED TUBE /SELF	42	0	0			0
16	Transportation / Buildings & Grounds	Parts Room		2,500	3	RETROFIT 8' 2L TO 4' 4 LED TUBE /SELF	42	0	0			0
17	Transportation / Buildings & Grounds	Parts Room		2,500	1	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
18	Transportation / Buildings & Grounds	Loft		800	2	RETROFIT 8' 2L TO 4' 4 LED TUBE /SELF	42	0	0			0
19	Transportation / Buildings & Grounds	Office		2,500	1	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	WALL SENSOR	32%	1,700	34
20	Transportation / Buildings & Grounds	Tank Room		2,500	2	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	WALL SENSOR	32%	1,700	67
21	Transportation / Buildings & Grounds	Tire Room		2,500	2	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	1	WALL SENSOR	32%	1,700	67
22	Transportation / Buildings & Grounds	(2) Bathroom		2,500	2	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
23	Transportation / Buildings & Grounds	Bus Drivers Lounge Hallway		1,000	1	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
24	Transportation / Buildings & Grounds	(2) Bathroom		1,000	4	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
25	Transportation / Buildings & Grounds	Files Room		1,000	3	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
26	Transportation / Buildings & Grounds	Kitchen / Drivers Lounge		1,000	10	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
27	Transportation / Buildings & Grounds	Large Storage		800	28	RETROFIT 4' 4L LED TUBE / SELF BALLA	42	0	0			0
28	Transportation / Buildings & Grounds	Large Storage		800	4	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	0	0			0
29	Transportation / Buildings & Grounds	Large Storage		800	5	RELAMP 15 WATT LED FLOOD S/I	15	0	0			0
30	Transportation / Buildings & Grounds	Bus Drivers Lockers		1,000	9	RETROFIT 4' 2L LED TUBE / SELF BALLA	21	1	WALL SENSOR	32%	680	60
31	Transportation / Buildings & Grounds	Exterior Lighting			0	0	0	0	0			0
32	Transportation / Buildings & Grounds	Wall Mount Flood Fixtures		4,380	3	NEW LED FLOOD 52 WATT	52	0	0			0
33	Transportation / Buildings & Grounds	Full Face Wall Packs		4,380	2	NEW LED WALL PACK 20 WATT	20	0	0			0
34	Transportation / Buildings & Grounds	Full Face Wall Packs		4,380	1	NEW LED WALL PACK 20 WATT	20	0	0			0
35	Transportation / Buildings & Grounds	Screw In Floods		4,380	2	RELAMP 15 WATT LED FLOOD S/I	15	0	0			0
36	Transportation / Buildings & Grounds	Wall Mount Incandescents		4,380	4	RELAMP 9 WATT LED A LAMP S/I	9	0	0			0
	Total: Transportation / Buildings & Grounds		**Total: Transportation / Buildings & Grounds**		**150**			**9**			**14,280**	**497**
	Grand Total		**Grand Total**		**6,254**			**107**				**14,112**

Appendix G: Jersey State Controls Proposal

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1105 INDUSTRIAL PARKWAY, BRICK NEW JERSEY 08724 OFFICE: 732-206-0010 FAX: 732-206-0080
JOE CRESCENZO CELL: 732-604-5733 EMAIL: JOE.CRESCENZO@JSCBMS.COM

ATC QUOTATION AND SCOPE OF WORK

TO: STEVE BRENNAN **ATTENTION: STEVE/BEN**
PROJECT: BARNEGAT HIGH SCHOOL
JSC BID #: **BID DATE:**
ADDENDA:
PLANS & SPECIFICATIONS DATED:
M/E CONSULTANT OR ARCHITECT:

JSC PROPOSES TO FURNISH AND INSTALL (A NEW OR EXTENSION TO) THE HVAC CONTROL/DDC SYSTEM AS DESCRIBED BELOW:

Scope including equipment, materials, labor, start up and warranty and customer training.

REFERENCES	SCOPE
THIS PROPOSAL IS IN ACCORDANCE W/PLANS AND SPECIFICATIONS	
FRONT END	JSC TO PROVIDE FRONT END THAT IS WEB BASED THAT CAN HAVE MULTIPLE CONCURRENT USERS (10)
BOILER	JSC TO TAKE CONTROL OF ENTIRE AERCO BOILER PLANT WITH PUMPS
CHILLER (2)	JSC TO TAKE CONTROL OF THE NEW CHILLER AND ASSOCIATED PUMPS AND ALSO THE EXISTING CHILLER IN THE C WING

OTHER NOTES: THIS PRICE INCLUDES WIRING OF THE COMMUNICATION CABLE, IF YOUR IN HOUSE GUYS WOULD LIKE TO DO IT, WE CAN TAKE 15% OFF OF THE TOTAL PRICE.

PRICE: $41,210.00

Unless specifically addressed in Scope of Work – referenced above – this quotation does not include:

1. Rigid Threaded or PVC coated Galvanized pipe
2. EMT / Hard Pipe in concealed spaces
3. Demolition labor of existing DDC, electrical or pneumatic controls
4. Check out or re-commissioning of any existing controls or HVAC system related to the quoted project
   Boiler trim wiring, mounting and wiring of any loose devices or accessories related to equipment provided by others. Boiler 'kill switches' or emergency shut downs are not included unless specifically specified.
5. Cooling system control wiring including mounting and wiring of Liebert, Daiken (or other mfr) network components, cabling or any communication or low voltage wiring related to systems being furnished by others
6. Cutting, patching, painting, fire stopping (other than code requirements)
7. Smoke dampers, Fire/Smoke Dampers or wiring therof
8. Installation of any valves, devices installed in piping, insulation or damper installations
9. Installation of controls (DDC, transformers, flow devices, etc) for VAV boxes scheduled to be factory installed
10. Smoke Detectors or any components related to the Fire Alarm/Life Safety System
11. Commissioning Labor of 3rd party controls not provided by JSC or equipment not furnished by JSC (unless specifically quoted)

12. Motor Starters / VFDs
13. Bond costs
14. Sales Tax
15. Overtime (all work figured at straight time 7am – 4pm M-F) unless otherwise quoted
16. Scope of Work, Pricing and Terms are good for 60 days from date of Proposal

Terms and Conditions of Sale

JERSEY STATE CONTROLS CO.

1. **OFFER AND ACCEPTANCE**: Jersey State Controls Co. (JSC) offers to sell the materials, equipment, and services as indicated above in strict accordance with the terms and conditions stated herein. Submittal of a Purchase Order or execution of the offer by Buyer, or allowing JSC to commence work shall be deemed an acceptance of this offer, which offer and acceptance shall constitute a legally enforceable contract between Buyer and JSC. Any additional or differing terms and conditions contained on Buyer's Purchase Order (whether or not such terms materially alter this offer) are hereby rejected by JSC, and shall not become part of the contract between Buyer and JSC unless expressly consented to in writing by JSC. This offer is subject to acceptance within (30) days after date and is based on all work being performed during regular working hours. If Buyer is a Contractor which employs JSC as a subcontractor on a project for which retainage will be held, pending satisfactory completion of the project, Buyer agrees to withhold from payments to JSC the same percent of retainage withheld from its progress payments. Buyer agrees further to reduce percent of retainage held from JSC to the same level and at the same time as its percent of retainage is reduced.

2. **TERMS**: Terms of payment for goods shipped and/or services rendered hereunder shall be NET ON RECEIPT OF INVOICE unless specifically agreed to otherwise. JSC reserves the right to add to any account outstanding more than (60) days, a charge of one and one-half percent (1 1/2%) of the principal amount due at the end of each thirty (30) day period.

3. **INVOICING**: JSC reserves the right to issue partial or complete invoices as material is furnished and as services are rendered.

4. **PERFORMANCE**: JSC shall not be liable for failure to ship, or delays in delivery of equipment, or performance of services hereunder, where such failure or delay is due to the disapproval of the Buyer's payment history by JSC's Credit Department, or due to strikes, fires, natural disasters, war, accidents, national emergency, failure to secure materials from the usual sources of supply, or any other circumstances beyond the control of JSC whether or not of the classes or causes enumerated above, which shall prevent JSC from making deliveries or performing services in the usual course of its business. In the event of the disapproval of the JSC Credit Department, or the occurrence of any of the above, JSC may, at its sole option, cancel Buyer's Purchase Order without penalty or liability on the part of JSC. Alternatively, JSC may extend the time for its performance by a period equal to the duration of the cause underlying JSC's failure or delay. Receipt of the equipment or services by Buyer, upon its delivery, shall constitute a waiver of all claims for delay.

5. **WARRANTY**: JSC guarantees all materials provided against defects in workmanship and material for a period of one (1) year from the date of owner's beneficial use or date of completion of the work, at JSC's sole discretion, and will repair or reinstall any defective products or components as JSC finds defective. This warranty is based on all work being performed during JSC's normal working hours.

6. **CANCELLATION**: JSC reserves the right to collect cancellation charges (including, but not limited to, all costs and expenses incurred, plus reasonable overhead and profit against any canceled order).

7. **COSTS TO JSC**: In the event it becomes necessary for JSC to incur any costs or expenses in the collection of monies due JSC from Buyer, or to enforce any of its rights or privileges hereunder, Buyer, upon demand, shall reimburse JSC for all such costs and expenses (including, but not limited to, reasonable collection and attorney's fees).

8. **ENTIRE AGREEMENT**: These terms and conditions, and the matter set forth on the face of JSC's offer to sell, constitute the entire agreement between JSC and Buyer. No course of dealings or performance, or prior, concurrent or subsequent understandings, agreements or representations become part of this contract unless expressly agreed to in writing by an authorized representative of JSC.

9. **ASSIGNMENT**: Buyer shall not assign this contract, or any interest herein, without written consent of JSC. Any actual or attempted assignment without JSC's written consent shall entitle JSC, at its sole option, to cancel this contract and, in such event; JSC shall be entitled to payment for all work performed and materials furnished to the date of cancellation, as well as reasonable compensation for lost income and profits.

Serving New Jersey's Construction Market Since 1983

1105 Industrial Parkway, Brick New Jersey 08724 Office: 732-206-0010 Fax: 732-206-0080
Joe Crescenzo Cell: 732-604-5733 email: Joe.crescenzo@jscbms.com

ATC QUOTATION AND SCOPE OF WORK

To: Steve Brennan **Attention: Steve/Ben**
Project: Robert Horbelt School
JSC Bid #: **Bid Date:**
Addenda:
Plans & Specifications dated:
M/E Consultant or Architect:

JSC proposes to furnish and install (a new or extension to) the HVAC Control/DDC system as described below:

Scope including equipment, materials, labor, start up and warranty and customer training.

References	Scope
This proposal is in accordance w/plans and specifications	
Front End	JSC to provide Front End that is web based that can have multiple concurrent users (10)
Boiler/Cooling Tower	JSC to take control of entire Aerco/DeDietrich boiler plant with associated pumps. The cooling tower will be taken control of along with the single pump located outside.
Heat Pumps	JSC to take control of the roughly (65) heat pumps in the classrooms/larger areas (gym, Café, etc.). This number is an estimate by Ben and what we saw on the floorplan.
Large AHU's	From what Ben and I saw it seems like these (3) large units are supplemental heat/outside air for the classrooms with heat pumps. JSC to program them for such application unless there is an alternate way the district would like it to run.

Other notes: This Price includes wiring of the communication cable, if your in house guys would like to do it, we can take 15% off of the total price.

Price: $155,082.00

Unless specifically addressed in Scope of Work – referenced above – this quotation does not include:

1. Rigid Threaded or PVC coated Galvanized pipe
2. EMT / Hard Pipe in concealed spaces
3. Demolition labor of existing DDC, electrical or pneumatic controls
4. Check out or re-commissioning of any existing controls or HVAC system related to the quoted project

Boiler trim wiring, mounting and wiring of any loose devices or accessories related to equipment provided by others. Boiler 'kill switches' or emergency shut downs are not included unless specifically specified.

5. Cooling system control wiring including mounting and wiring of Liebert, Daiken (or other mfr) network components, cabling or any communication or low voltage wiring related to systems being furnished by others
6. Cutting, patching, painting, fire stopping (other than code requirements)
7. Smoke dampers, Fire/Smoke Dampers or wiring therof
8. Installation of any valves, devices installed in piping, insulation or damper installations
9. Installation of controls (DDC, transformers, flow devices, etc) for VAV boxes scheduled to be factory installed
10. Smoke Detectors or any components related to the Fire Alarm/Life Safety System
11. Commissioning Labor of 3rd party controls not provided by JSC or equipment not furnished by JSC (unless specifically quoted)
12. Motor Starters / VFDs
13. Bond costs
14. Sales Tax
15. Overtime (all work figured at straight time 7am – 4pm M-F) unless otherwise quoted
16. Scope of Work, Pricing and Terms are good for 60 days from date of Proposal

Terms and Conditions of Sale

JERSEY STATE CONTROLS CO.

1. **OFFER AND ACCEPTANCE**: Jersey State Controls Co. (JSC) offers to sell the materials, equipment, and services as indicated above in strict accordance with the terms and conditions stated herein. Submittal of a Purchase Order or execution of the offer by Buyer, or allowing JSC to commence work shall be deemed an acceptance of this offer, which offer and acceptance shall constitute a legally enforceable contract between Buyer and JSC. Any additional or differing terms and conditions contained on Buyer's Purchase Order (whether or not such terms materially alter this offer) are hereby rejected by JSC, and shall not become part of the contract between Buyer and JSC unless expressly consented to in writing by JSC. This offer is subject to acceptance within (30) days after date and is based on all work being performed during regular working hours. If Buyer is a Contractor which employs JSC as a subcontractor on a project for which retainage will be held, pending satisfactory completion of the project, Buyer agrees to withhold from payments to JSC the same percent of retainage withheld from its progress payments. Buyer agrees further to reduce percent of retainage held from JSC to the same level and at the same time as its percent of retainage is reduced.

2. **TERMS**: Terms of payment for goods shipped and/or services rendered hereunder shall be NET ON RECEIPT OF INVOICE unless specifically agreed to otherwise. JSC reserves the right to add to any account outstanding more than (60) days, a charge of one and one-half percent (1 1/2%) of the principal amount due at the end of each thirty (30) day period.

3. **INVOICING**: JSC reserves the right to issue partial or complete invoices as material is furnished and as services are rendered.

4. **PERFORMANCE**: JSC shall not be liable for failure to ship, or delays in delivery of equipment, or performance of services hereunder, where such failure or delay is due to the disapproval of the Buyer's payment history by JSC's Credit Department, or due to strikes, fires, natural disasters, war, accidents, national emergency, failure to secure materials from the usual sources of supply, or any other circumstances beyond the control of JSC whether or not of the classes or causes enumerated above, which shall prevent JSC from making deliveries or performing services in the usual course of its business. In the event of the disapproval of the JSC Credit Department, or the occurrence of any of the above, JSC may, at its sole option, cancel Buyer's Purchase Order without penalty or liability on the part of JSC. Alternatively, JSC may extend the time for its performance by a period equal to the duration of the cause underlying JSC's failure or delay. Receipt of the equipment or services by Buyer, upon its delivery, shall constitute a waiver of all claims for delay.

5. **WARRANTY**: JSC guarantees all materials provided against defects in workmanship and material for a period of one (1) year from the date of owner's beneficial use or date of completion of the work, at JSC's sole discretion, and will repair or reinstall any defective products or components as JSC finds defective. This warranty is based on all work being performed during JSC's normal working hours.

6. **CANCELLATION**: JSC reserves the right to collect cancellation charges (including, but not limited to, all costs and expenses incurred, plus reasonable overhead and profit against any canceled order).

7. **COSTS TO JSC**: In the event it becomes necessary for JSC to incur any costs or expenses in the collection of monies due JSC from Buyer, or to enforce any of its rights or privileges hereunder, Buyer, upon demand, shall reimburse JSC for all such costs and expenses (including, but not limited to, reasonable collection and attorney's fees).

8. **ENTIRE AGREEMENT**: These terms and conditions, and the matter set forth on the face of JSC's offer to sell, constitute the entire agreement between JSC and Buyer. No course of dealings or performance, or prior, concurrent or subsequent understandings, agreements or representations become part of this contract unless expressly agreed to in writing by an authorized representative of JSC.

9. **ASSIGNMENT**: Buyer shall not assign this contract, or any interest herein, without written consent of JSC. Any actual or attempted assignment without JSC's written consent shall entitle JSC, at its sole option, to cancel this contract and, in such event; JSC shall be entitled to payment for all work performed and materials furnished to the date of cancellation, as well as reasonable compensation for lost income and profits.

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1105 INDUSTRIAL PARKWAY, BRICK NEW JERSEY 08724 OFFICE: 732-206-0010 FAX: 732-206-0080
JOE CRESCENZO CELL: 732-604-5733 EMAIL: JOE.CRESCENZO@JSCBMS.COM

ATC QUOTATION AND SCOPE OF WORK

TO: STEVE BRENNAN ATTENTION: **STEVE/BEN**
PROJECT: RUSSELL BRACKMAN MIDDLE SCHOOL
JSC BID #: BID DATE:
ADDENDA:
PLANS & SPECIFICATIONS DATED:
M/E CONSULTANT OR ARCHITECT:

JSC PROPOSES TO FURNISH AND INSTALL (A NEW OR EXTENSION TO) THE HVAC CONTROL/DDC SYSTEM AS DESCRIBED BELOW:

Scope including equipment, materials, labor, start up and warranty and customer training.

REFERENCES	SCOPE
THIS PROPOSAL IS IN ACCORDANCE W/PLANS AND SPECIFICATIONS	
FRONT END	JSC TO PROVIDE FRONT END THAT IS WEB BASED THAT CAN HAVE MULTIPLE CONCURRENT USERS (10)
DOAS UNITS	THERE ARE (6) DOAS UNITS THAT PROVIDE FRESH AIR THROUGHOUT THE BUILDING. THESE HAVE DX COOLING AND HOT WATER VALVES. JSC TO CONTROL THESE AND SEQUENCE THEM TO THE EXACT SEQUENCE THEY WERE RUNNING PRIOR.
AAON RTU'S	THERE ARE (8) PACKAGED ROOFTOP UNITS ON THE ROOF THAT SERVE THE GYM'S (6), THE MAIN OFFICE (1) AND THE WEIGHT ROOM (1).
BOILER AND GEOTHERMAL PLANT	JSC TO TAKE CONTROL OF ENTIRE BOILER PLANT WITH ASSOCIATED PUMPS THAT SERVE THE NEW WING. THE GEOTHERMAL PLANT WILL BE TAKEN CONTROL OVER AS WELL INCLUDING CONTROL OF THE COOLING TOWER AND ASSOCIATED PUMPS.
WATER SOURCE HEAT PUMPS	THERE ARE ROUGHLY (12) OF THESE THAT SERVE VARIOUS PARTS OF THE BUILDING THAT HAVE DX ALONG WITH ELECTRIC HEAT AND WILL WORK OFF A THERMOSTAT.
CABINET/UNIT HEATERS	THERE ARE AN ESTIMATED (12) THROUGHOUT THE BUILDING THAT WE WILL CONTROL VIA A THERMOSTAT. JSC WILL MONITOR THE SPACE TEMP AND ALARM IF THE FAN IS CALLED TO BE ON AND IS NOT RUNNING.

Unit Vents	**JSC to take control of the roughly (53) Unit Vents in the classrooms, this number is an estimate by Ben and what we saw on the floorplan. JSC to sequence them the same way they were being controlled prior.**
VAV's	**The "new" wing has roughly (20) VAV box's with reheat coils. JSC to take control of the VAV box's along with the reheat coils.**

Other notes: This Price includes wiring of the communication cable, if your in house guys would like to do it, we can take 15% off of the total price.

Price: $282,675.00

Unless specifically addressed in Scope of Work – referenced above – this quotation does not include:

1. Rigid Threaded or PVC coated Galvanized pipe
2. EMT / Hard Pipe in concealed spaces
3. Demolition labor of existing DDC, electrical or pneumatic controls
4. Check out or re-commissioning of any existing controls or HVAC system related to the quoted project

Boiler trim wiring, mounting and wiring of any loose devices or accessories related to equipment provided by others. Boiler 'kill switches' or emergency shut downs are not included unless specifically specified.

5. Cooling system control wiring including mounting and wiring of Liebert, Daiken (or other mfr) network components, cabling or any communication or low voltage wiring related to systems being furnished by others
6. Cutting, patching, painting, fire stopping (other than code requirements)
7. Smoke dampers, Fire/Smoke Dampers or wiring therof
8. Installation of any valves, devices installed in piping, insulation or damper installations
9. Installation of controls (DDC, transformers, flow devices, etc) for VAV boxes scheduled to be factory installed
10. Smoke Detectors or any components related to the Fire Alarm/Life Safety System
11. Commissioning Labor of 3rd party controls not provided by JSC or equipment not furnished by JSC (unless specifically quoted)
12. Motor Starters / VFDs
13. Bond costs
14. Sales Tax
15. Overtime (all work figured at straight time 7am – 4pm M-F) unless otherwise quoted
16. Scope of Work, Pricing and Terms are good for 60 days from date of Proposal

Terms and Conditions of Sale

JERSEY STATE CONTROLS CO.

1. **OFFER AND ACCEPTANCE**: Jersey State Controls Co. (JSC) offers to sell the materials, equipment, and services as indicated above in strict accordance with the terms and conditions stated herein. Submittal of a Purchase Order or execution of the offer by Buyer, or allowing JSC to commence work shall be deemed an acceptance of this offer, which offer and acceptance shall constitute a legally enforceable contract between Buyer and JSC. Any additional or differing terms and conditions contained on Buyer's Purchase Order (whether or not such terms materially alter this offer) are hereby rejected by JSC, and shall not become part of the contract between Buyer and JSC unless expressly consented to in writing by JSC. This offer is subject to acceptance within (30) days after date and is based on all work being performed during regular working hours. If Buyer is a Contractor which employs JSC as a subcontractor on a project for which retainage will be held, pending satisfactory completion of the project, Buyer agrees to withhold from payments to JSC the same percent of retainage withheld from its progress payments. Buyer agrees further to reduce percent of retainage held from JSC to the same level and at the same time as its percent of retainage is reduced.

2. **TERMS**: Terms of payment for goods shipped and/or services rendered hereunder shall be NET ON RECEIPT OF INVOICE unless specifically agreed to otherwise. JSC reserves the right to add to any account outstanding more than (60) days, a charge of one and one-half percent (1 1/2%) of the principal amount due at the end of each thirty (30) day period.

3. **INVOICING**: JSC reserves the right to issue partial or complete invoices as material is furnished and as services are rendered.

4. **PERFORMANCE**: JSC shall not be liable for failure to ship, or delays in delivery of equipment, or performance of services hereunder, where such failure or delay is due to the disapproval of the Buyer's payment history by JSC's Credit Department, or due to strikes, fires, natural disasters, war, accidents, national emergency, failure to secure materials from the usual sources of supply, or any other circumstances beyond the control of JSC whether or not of the classes or causes enumerated above, which shall prevent JSC from making deliveries or performing services in the usual course of its business. In the event of the disapproval of the JSC Credit Department, or the occurrence of any of the above, JSC may, at its sole option, cancel Buyer's Purchase Order without penalty or liability on the part of JSC. Alternatively, JSC may extend the time for its performance by a period equal to the duration of the cause underlying JSC's failure or delay. Receipt of the equipment or services by Buyer, upon its delivery, shall constitute a waiver of all claims for delay.

5. **WARRANTY**: JSC guarantees all materials provided against defects in workmanship and material for a period of one (1) year from the date of owner's beneficial use or date of completion of the work, at JSC's sole discretion, and will repair or reinstall any defective products or components as JSC finds defective. This warranty is based on all work being performed during JSC's normal working hours.

6. **CANCELLATION**: JSC reserves the right to collect cancellation charges (including, but not limited to, all costs and expenses incurred, plus reasonable overhead and

profit against any canceled order).

7. **COSTS TO JSC**: In the event it becomes necessary for JSC to incur any costs or expenses in the collection of monies due JSC from Buyer, or to enforce any of its rights or privileges hereunder, Buyer, upon demand, shall reimburse JSC for all such costs and expenses (including, but not limited to, reasonable collection and attorney's fees).

8. **ENTIRE AGREEMENT**: These terms and conditions, and the matter set forth on the face of JSC's offer to sell, constitute the entire agreement between JSC and Buyer. No course of dealings or performance, or prior, concurrent or subsequent understandings, agreements or representations become part of this contract unless expressly agreed to in writing by an authorized representative of JSC.

9. **ASSIGNMENT**: Buyer shall not assign this contract, or any interest herein, without written consent of JSC. Any actual or attempted assignment without JSC's written consent shall entitle JSC, at its sole option, to cancel this contract and, in such event; JSC shall be entitled to payment for all work performed and materials furnished to the date of cancellation, as well as reasonable compensation for lost income and profits.

Serving New Jersey's Construction Market Since 1983

1105 Industrial Parkway, Brick New Jersey 08724 Office: 732-206-0010 Fax: 732-206-0080
Joe Crescenzo Cell: 732-604-5733 email: Joe.crescenzo@jscbms.com

ATC QUOTATION AND SCOPE OF WORK

To: Steve Brennan **Attention: Steve/Ben**
Project: Collins Elementary School
JSC Bid #: **Bid Date:**
Addenda:
Plans & Specifications dated:
M/E Consultant or Architect:

JSC proposes to furnish and install (a new or extension to) the HVAC Control/DDC system as described below:

Scope including equipment, materials, labor, start up and warranty and customer training.

References	Scope
This proposal is in accordance w/plans and specifications	
Front End	JSC to provide Front End that is web based that can have multiple concurrent users (10)
Boiler	JSC to take control of entire Aerco boiler plant with pumps
AHU/RTU's (10)	JSC to take control of the 10 AHU/RTU units and will re-sequence them based on the existing sequence.
ERU's (4)	JSC to take control of the 4 ERU's that serve fresh air for the classrooms. JSC will re-sequence these based on the existing sequence.
VAV's (42)	There are roughly 42 VAV's that serve the classrooms that JSC will take control over and also have a balancer come out and properly balance the CFM requirements for each space.
UV Control (34)	Currently the UV's in classrooms are being turned on/off based on space temp and additional heat needed in the areas, JSC to replicate current sequence.

Other notes: This Price includes wiring of the communication cable, if your in house guys would like to do it, we can take 15% off of the total price.

Price: $163,372.00

Serving the HVAC Industry since 1983 - BACnet and Open Protocol Control Systems
Schneider Electric Controls Partner (Formerly Andover, TAC) – Square D Variable Frequency Drives Distributor - Platinum Reseller for Belimo Valves & Actuators - 24 / 7 Facility Monitoring - LON & BACnet Integrators

Unless specifically addressed in Scope of Work – referenced above – this quotation does not include:

1. Rigid Threaded or PVC coated Galvanized pipe
2. EMT / Hard Pipe in concealed spaces
3. Demolition labor of existing DDC, electrical or pneumatic controls
4. Check out or re-commissioning of any existing controls or HVAC system related to the quoted project

Boiler trim wiring, mounting and wiring of any loose devices or accessories related to equipment provided by others. Boiler 'kill switches' or emergency shut downs are not included unless specifically specified.

5. Cooling system control wiring including mounting and wiring of Liebert, Daiken (or other mfr) network components, cabling or any communication or low voltage wiring related to systems being furnished by others
6. Cutting, patching, painting, fire stopping (other than code requirements)
7. Smoke dampers, Fire/Smoke Dampers or wiring therof
8. Installation of any valves, devices installed in piping, insulation or damper installations
9. Installation of controls (DDC, transformers, flow devices, etc) for VAV boxes scheduled to be factory installed
10. Smoke Detectors or any components related to the Fire Alarm/Life Safety System
11. Commissioning Labor of 3rd party controls not provided by JSC or equipment not furnished by JSC (unless specifically quoted)
12. Motor Starters / VFDs
13. Bond costs
14. Sales Tax
15. Overtime (all work figured at straight time 7am – 4pm M-F) unless otherwise quoted
16. Scope of Work, Pricing and Terms are good for 60 days from date of Proposal

Terms and Conditions of Sale

JERSEY STATE CONTROLS CO.

1. **OFFER AND ACCEPTANCE**: Jersey State Controls Co. (JSC) offers to sell the materials, equipment, and services as indicated above in strict accordance with the terms and conditions stated herein. Submittal of a Purchase Order or execution of the offer by Buyer, or allowing JSC to commence work shall be deemed an acceptance of this offer, which offer and acceptance shall constitute a legally enforceable contract between Buyer and JSC. Any additional or differing terms and conditions contained on Buyer's Purchase Order (whether or not such terms materially alter this offer) are hereby rejected by JSC, and shall not become part of the contract between Buyer and JSC unless expressly consented to in writing by JSC. This offer is subject to acceptance within (30) days after date and is based on all work being performed during regular working hours. If Buyer is a Contractor which employs JSC as a subcontractor on a project for which retainage will be held, pending satisfactory completion of the project, Buyer agrees to withhold from payments to JSC the same percent of retainage withheld from its progress payments. Buyer agrees further to reduce percent of retainage held from JSC to the same level and at the same time as its percent of retainage is reduced.

2. **TERMS**: Terms of payment for goods shipped and/or services rendered hereunder shall be NET ON RECEIPT OF INVOICE unless specifically agreed to otherwise. JSC reserves the right to add to any account outstanding more than (60) days, a charge of one and one-half percent (1 1/2%) of the principal amount due at the end of each thirty (30) day period.

3. **INVOICING**: JSC reserves the right to issue partial or complete invoices as material is furnished and as services are rendered.

4. **PERFORMANCE**: JSC shall not be liable for failure to ship, or delays in delivery of equipment, or performance of services hereunder, where such failure or delay is due to the disapproval of the Buyer's payment history by JSC's Credit Department, or due to strikes, fires, natural disasters, war, accidents, national emergency, failure to secure materials from the usual sources of supply, or any other circumstances beyond the control of JSC whether or not of the classes or causes enumerated above, which shall prevent JSC from making deliveries or performing services in the usual course of its business. In the event of the disapproval of the JSC Credit Department, or the occurrence of any of the above, JSC may, at its sole option, cancel Buyer's Purchase Order without penalty or liability on the part of JSC. Alternatively, JSC may extend the time for its performance by a period equal to the duration of the cause underlying JSC's failure or delay. Receipt of the equipment or services by Buyer, upon its delivery, shall constitute a waiver of all claims for delay.

5. **WARRANTY**: JSC guarantees all materials provided against defects in workmanship and material for a period of one (1) year from the date of owner's beneficial use or date of completion of the work, at JSC's sole discretion, and will repair or reinstall any defective products or components as JSC finds defective. This warranty is based on all work being performed during JSC's normal working hours.

6. **CANCELLATION**: JSC reserves the right to collect cancellation charges (including, but not limited to, all costs and expenses incurred, plus reasonable overhead and profit against any canceled order).

7. **COSTS TO JSC**: In the event it becomes necessary for JSC to incur any costs or expenses in the collection of monies due JSC from Buyer, or to enforce any of its rights or privileges hereunder, Buyer, upon demand, shall reimburse JSC for all such costs and expenses (including, but not limited to, reasonable collection and attorney's fees).

8. **ENTIRE AGREEMENT**: These terms and conditions, and the matter set forth on the face of JSC's offer to sell, constitute the entire agreement between JSC and

Buyer. No course of dealings or performance, or prior, concurrent or subsequent understandings, agreements or representations become part of this contract unless expressly agreed to in writing by an authorized representative of JSC.

9. **ASSIGNMENT**: Buyer shall not assign this contract, or any interest herein, without written consent of JSC. Any actual or attempted assignment without JSC's written consent shall entitle JSC, at its sole option, to cancel this contract and, in such event; JSC shall be entitled to payment for all work performed and materials furnished to the date of cancellation, as well as reasonable compensation for lost income and profits.

Serving New Jersey's Construction Market Since 1983

1105 INDUSTRIAL PARKWAY, BRICK NEW JERSEY 08724   OFFICE: 732-206-0010 FAX: 732-206-0080
JOE CRESCENZO CELL: 732-604-5733   EMAIL: JOE.CRESCENZO@JSCBMS.COM

ATC QUOTATION AND SCOPE OF WORK

TO: STEVE BRENNAN ATTENTION: **STEVE/BEN**
PROJECT: DONAHUE ELEMENTARY SCHOOL
JSC BID #: BID DATE:
ADDENDA:
PLANS & SPECIFICATIONS DATED:
M/E CONSULTANT OR ARCHITECT:

JSC PROPOSES TO FURNISH AND INSTALL (A NEW OR EXTENSION TO) THE HVAC CONTROL/DDC SYSTEM AS DESCRIBED BELOW:

Scope including equipment, materials, labor, start up and warranty and customer training.

REFERENCES	SCOPE
THIS PROPOSAL IS IN ACCORDANCE W/PLANS AND SPECIFICATIONS	
FRONT END	JSC TO PROVIDE FRONT END THAT IS WEB BASED THAT CAN HAVE MULTIPLE CONCURRENT USERS (10)
BOILER/COOLING TOWER	JSC TO TAKE CONTROL OF ENTIRE AERCO BOILER PLANT WITH (2) ASSOCIATED PUMPS AND THE COOLING TOWER ALONG WITH ITS (2) ASSOCIATED PUMPS.
DOAS (5)	JSC TO TAKE CONTROL OF THE 4 DOAS UNITS THAT SERVE FRESH AIR FOR THE CLASSROOMS. JSC WILL RE-SEQUENCE THESE BASED ON THE EXISTING SEQUENCE.
WATER SOURCE HP'S (47)	THERE ARE ROUGHLY 47 WSHP'S THAT SERVE THE CLASSROOMS THAT JSC WILL TAKE CONTROL OVER AND WILL SEQUENCE THESE TO OPERATE AS THEY WERE PREVIOUSLY.

OTHER NOTES: THIS PRICE INCLUDES WIRING OF THE COMMUNICATION CABLE, IF YOUR IN HOUSE GUYS WOULD LIKE TO DO IT, WE CAN TAKE 15% OFF OF THE TOTAL PRICE.

PRICE: $163,372.00

Unless specifically addressed in Scope of Work – referenced above – this quotation does not include:

1. Rigid Threaded or PVC coated Galvanized pipe
2. EMT / Hard Pipe in concealed spaces
3. Demolition labor of existing DDC, electrical or pneumatic controls
4. Check out or re-commissioning of any existing controls or HVAC system related to the quoted project

   Boiler trim wiring, mounting and wiring of any loose devices or accessories related to equipment provided by others. Boiler 'kill switches' or emergency shut downs are not included unless specifically specified.
5. Cooling system control wiring including mounting and wiring of Liebert, Daiken (or other mfr) network components, cabling or any communication or low voltage wiring related to systems being furnished by others
6. Cutting, patching, painting, fire stopping (other than code requirements)
7. Smoke dampers, Fire/Smoke Dampers or wiring therof
8. Installation of any valves, devices installed in piping, insulation or damper installations
9. Installation of controls (DDC, transformers, flow devices, etc) for VAV boxes scheduled to be factory installed
10. Smoke Detectors or any components related to the Fire Alarm/Life Safety System
11. Commissioning Labor of 3rd party controls not provided by JSC or equipment not furnished by JSC (unless specifically quoted)
12. Motor Starters / VFDs
13. Bond costs
14. Sales Tax
15. Overtime (all work figured at straight time 7am – 4pm M-F) unless otherwise quoted
16. Scope of Work, Pricing and Terms are good for 60 days from date of Proposal

Terms and Conditions of Sale

JERSEY STATE CONTROLS CO.

1. **OFFER AND ACCEPTANCE**: Jersey State Controls Co. (JSC) offers to sell the materials, equipment, and services as indicated above in strict accordance with the terms and conditions stated herein. Submittal of a Purchase Order or execution of the offer by Buyer, or allowing JSC to commence work shall be deemed an acceptance of this offer, which offer and acceptance shall constitute a legally enforceable contract between Buyer and JSC. Any additional or differing terms and conditions contained on Buyer's Purchase Order (whether or not such terms materially alter this offer) are hereby rejected by JSC, and shall not become part of the contract between Buyer and JSC unless expressly consented to in writing by JSC. This offer is subject to acceptance within (30) days after date and is based on all work being performed during regular working hours. If Buyer is a Contractor which employs JSC as a subcontractor on a project for which retainage will be held, pending satisfactory completion of the project, Buyer agrees to withhold from payments to JSC the same percent of retainage withheld from its progress payments. Buyer agrees further to reduce percent of retainage held from JSC to the same level and at the same time as its percent of retainage is reduced.

2. **TERMS**: Terms of payment for goods shipped and/or services rendered hereunder shall be NET ON RECEIPT OF INVOICE unless specifically agreed to otherwise. JSC reserves the right to add to any account outstanding more than (60) days, a charge of one and one-half percent (1 1/2%) of the principal amount due at the end of each thirty (30) day period.

3. **INVOICING**: JSC reserves the right to issue partial or complete invoices as material is furnished and as services are rendered.

4. **PERFORMANCE**: JSC shall not be liable for failure to ship, or delays in delivery of equipment, or performance of services hereunder, where such failure or delay is due to the disapproval of the Buyer's payment history by JSC's Credit Department, or due to strikes, fires, natural disasters, war, accidents, national emergency, failure to secure materials from the usual sources of supply, or any other circumstances beyond the control of JSC whether or not of the classes or causes enumerated above, which shall prevent JSC from making deliveries or performing services in the usual course of its business. In the event of the disapproval of the JSC Credit Department, or the occurrence of any of the above, JSC may, at its sole option, cancel Buyer's Purchase Order without penalty or liability on the part of JSC. Alternatively, JSC may extend the time for its performance by a period equal to the duration of the cause underlying JSC's failure or delay. Receipt of the equipment or services by Buyer, upon its delivery, shall constitute a waiver of all claims for delay.

5. **WARRANTY**: JSC guarantees all materials provided against defects in workmanship and material for a period of one (1) year from the date of owner's beneficial use or date of completion of the work, at JSC's sole discretion, and will repair or reinstall any defective products or components as JSC finds defective. This warranty is based on all work being performed during JSC's normal working hours.

6. **CANCELLATION**: JSC reserves the right to collect cancellation charges (including, but not limited to, all costs and expenses incurred, plus reasonable overhead and profit against any canceled order).

7. **COSTS TO JSC**: In the event it becomes necessary for JSC to incur any costs or expenses in the collection of monies due JSC from Buyer, or to enforce any of its rights or privileges hereunder, Buyer, upon demand, shall reimburse JSC for all such costs and expenses (including, but not limited to, reasonable collection and attorney's fees).

8. **ENTIRE AGREEMENT**: These terms and conditions, and the matter set forth on the face of JSC's offer to sell, constitute the entire agreement between JSC and Buyer. No course of dealings or performance, or prior, concurrent or subsequent understandings, agreements or representations become part of this contract unless expressly agreed to in writing by an authorized representative of JSC.

9. **ASSIGNMENT**: Buyer shall not assign this contract, or any interest herein, without written consent of JSC. Any actual or attempted assignment without JSC's written consent shall entitle JSC, at its sole option, to cancel this contract and, in such event; JSC shall be entitled to payment for all work performed and materials furnished to the date of cancellation, as well as reasonable compensation for lost income and profits.

Serving New Jersey's Construction Market Since 1983

1105 Industrial Parkway, Brick New Jersey 08724 Office: 732-206-0010 Fax: 732-206-0080
Joe Crescenzo Cell: 732-604-5733 email: Joe.crescenzo@jscbms.com

ATC QUOTATION AND SCOPE OF WORK

To: Steve Brennan Attention: **Steve/Ben**
Project: Lillian M Dunfee School
JSC Bid #: Bid Date:
Addenda:
Plans & Specifications dated:
M/E Consultant or Architect:

JSC proposes to furnish and install (a new or extension to) the HVAC Control/DDC system as described below:

Scope including equipment, materials, labor, start up and warranty and customer training.

References	Scope
This proposal is in accordance w/plans and specifications	
Front End	JSC to provide Front End that is web based that can have multiple concurrent users (10)
Boiler	JSC to take control of entire Laars boiler plant with associated pumps.
Large 4 Seasons Units	JSC to take control of these (4) large units that serve the classroom pod areas. They each have an average of 7-8 zones per unit.
AAON VAV RTU's	JSC to take control of the (2) AAON RTU's that serve the 10 VAV box's in the 5th grade wing.
AAON RTU's	JSC to take control of the (3) RTU's in the gym and the library media center. JSC to install Bacnet communicating thermostat for this single space control.
VAV's	JSC to install controls to operate the 10 VAV's in the 5th grade wing.
Multipurpose room AHU	KSC to take control of this large AHU that has 4 stages of electric heat supplying the M.P. Room.

Other notes: This Price includes wiring of the communication cable, if your in house guys would like to do it, we can take 15% off of the total price.

Price: $131,881.00

Unless specifically addressed in Scope of Work – referenced above – this quotation does not include:

1. Rigid Threaded or PVC coated Galvanized pipe
2. EMT / Hard Pipe in concealed spaces
3. Demolition labor of existing DDC, electrical or pneumatic controls
4. Check out or re-commissioning of any existing controls or HVAC system related to the quoted project
   Boiler trim wiring, mounting and wiring of any loose devices or accessories related to equipment provided by others. Boiler 'kill switches' or emergency shut downs are not included unless specifically specified.
5. Cooling system control wiring including mounting and wiring of Liebert, Daiken (or other mfr) network components, cabling or any communication or low voltage wiring related to systems being furnished by others
6. Cutting, patching, painting, fire stopping (other than code requirements)
7. Smoke dampers, Fire/Smoke Dampers or wiring therof
8. Installation of any valves, devices installed in piping, insulation or damper installations
9. Installation of controls (DDC, transformers, flow devices, etc) for VAV boxes scheduled to be factory installed
10. Smoke Detectors or any components related to the Fire Alarm/Life Safety System
11. Commissioning Labor of 3rd party controls not provided by JSC or equipment not furnished by JSC (unless specifically quoted)
12. Motor Starters / VFDs
13. Bond costs
14. Sales Tax
15. Overtime (all work figured at straight time 7am – 4pm M-F) unless otherwise quoted
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9. **ASSIGNMENT**: Buyer shall not assign this contract, or any interest herein, without written consent of JSC. Any actual or attempted assignment without JSC's written consent shall entitle JSC, at its sole option, to cancel this contract and, in such event; JSC shall be entitled to payment for all work performed and materials furnished to the date of cancellation, as well as reasonable compensation for lost income and profits.

Appendix H: BPU Forms

FORM I

ENGINEERING FIRM's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
GENERAL INFORMATION: CONTRACTOR
BARNEGAT TOWNSHIP SCHOOL DISTRICT
ENERGY SAVINGS IMPROVEMENT PROGRAM

1. Name of firm: CHA Consulting, Inc.
2. Address: III Winner's Circle
   PO Box 5307
   Albany, NY 12205-0307
3. Contact person for this project (Name & Title): Mike Tsakaloyannis
   Project Manager
4. Telephone number of contact person: (518) 453-8772
5. E-mail address of contact person: MTsakaloyannis@CHACompanies.com
6. Lead personnel for this project (persons who will have supervisory or other responsibility for the work to be performed). Please list all personnel below:

Name	Title
Mike Tsakaloyannis	Project Manager
Michael Masny	Energy Section Manager
Richard Adamski	Project Engineer IV

FORM II

ENGINEERING FIRM's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ENERGY CONSERVATION MEASURES (ECMs) SUMMARY FORM
BARNEGAT TOWNSHIP SCHOOL DISTRICT
ENERGY SAVINGS IMPROVEMENT PROGRAM

Engineer Name: CHA Consulting, Inc.

Proposed Preliminary Energy Savings Plan: EMCs (Base Project)		Estimated Installed Hard Costs [1] ($)	Estimated Annual Savings ($)	Estimated Simple Payback (years)
1.01	Convert all interior lighting to LED lighting	$ 1,082,118	$ 68,513	15.8
1.02	Install occupancy/daylight/dimming controls	$ 44,333	$ 3,140	14.1
1.03	Convert all exterior lighting to LED lighting and install controls	$ 150,215	$ 13,417	11.2
2.01	Replace Boilers, optimization controls	$ 758,967	$ 7,995	94.9
2.02	DHW Boiler Upgrade	$ 38,114	$ 773	49.3
2.03	DHW Tankless System Conversion	$ 10,611	$ 175	60.8
2.04	DHW Heater Electric to a Natural Gas Conversion	$ 26,779	$ 658	40.7
2.05	Install VFDs on Pumps	$ 16,280	$ 361	45.1
2.06	Install VFDs on AHU Fans	$ 188,172	$ 20,645	9.1
2.09	Upgrade Select WSHPs	$ 183,131	$ 2,784	65.8
2.10	Convert AHUs w/ Electric Heat to Hydronic Heat	$ 33,293	$ 3,862	8.6
2.13	Replace Mini-Split Units	$ 14,368	$ 109	131.3
2.14	Exhaust Fan Controls Upgrade	$ 21,321	$ 3,315	6.4
2.15	Replace Cooling Tower	$ 245,865	$ 1,221	201.4
2.17	Replace Air Cooled Chiller	$ 203,855	$ 3,625	56.2
3.01	Controls Systems Upgrades	$ 1,207,607	$ 32,743	36.9
3.02	Install Walk-In Refrigerator/Freezer Controls	$ 50,484	$ 5,142	9.8
3.03	Install kitchen hood controls	$ 250,048	$ 2,439	102.5
3.04	Kitchen hood controls optimization	$ 8,954	$ 1,355	6.6
3.08	Add occupancy-based controls to the Vending Machines	$ 10,102	$ 3,123	3.2
6.01	Install CHP and Controls	$ 333,593	$ 5,071	65.8
	Project Summary:	$ 4,878,212	$ 180,465	27.0

Optional ECMs *Considered, but not included with base project at this time*		Estimated Installed Hard Costs ($)	Estimated Annual Savings ($)	Estimated Simple Payback (years)
2.01	Replace Boilers, optimization controls (Brackman)	$ 315,634	$ 2,157	146.3
2.15	Replace Cooling Tower (Horbelt)	$ 245,865	$ 1,221	201.4
2.09	Upgrade WSHPs (Brackman)	$ 195,298	$ (3,928)	-49.7
	Project Summary w/ Optional ECMs:	$ 5,635,009	$ 179,915	31.3

FORM III

ENGINEERING FIRM's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
PROJECTED ANNUAL ENERGY SAVINGS DATA FORM
BARNEGAT TOWNSHIP SCHOOL DISTRICT
ENERGY SAVINGS IMPROVEMENT PROGRAM

Engineer Name: CHA Consulting, Inc.

Energy / Water	**Engineer Developed Baseline (Units)**	**Engineer Developed Baseline (Costs $)**	**Proposed Annual Savings (Units)**	**Proposed Annual Savings (Cost $)**
Electric Demand (kW)	1,877.1		379.6	$ 2,322
Electric Energy (kWh)	5,565,440	$ 658,027	1,270,584	$ 124,425
Natural Gas (therms)	123,201	$ 132,715	14,910	$ 16,143
Steam (Lbs)	0	$ -	0	$ -
Water (Gallons)	5,297,000	$ 124,035	753,863	$ 4,556
Other (Specify Units)	N/A	N/A	N/A	N/A
Other (Specify Units)	N/A	N/A	N/A	N/A

Avoided Emissions	**Provide in Pounds (Lbs)**
CO_2	5,406,530 Lbs
NO_X	3,498 Lbs
SO_2	2,713 Lbs

FORM IV

ENGINEERING FIRM's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
PROJECTED ANNUAL ENERGY SAVINGS DATA FORM IN MMBTUs
BARNEGAT TOWNSHIP SCHOOL DISTRICT
ENERGY SAVINGS IMPROVEMENT PROGRAM

Engineer Name: CHA Consulting, Inc.

Energy / Water	Engineer Developed Baseline (Units)	Proposed Annual Savings (Units)	Comments
Electric Energy (kWh)	$ 658,027	1,270,584	
Natural Gas (therms)	$ 132,715	14,910	
Steam (Lbs)	$ -	0	N/A
Water (Gallons)	$ 124,035	753,863	
Other (Specify Units)	N/A	N/A	N/A
Other (Specify Units)	N/A	N/A	N/A

FORM V

ENGINEERING FIRM's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ENGINEER's PROPOSED FINAL PROJECT COST FORM FOR BASE CASE PROJECT
BARNEGAT TOWNSHIP SCHOOL DISTRICT
ENERGY SAVINGS IMPROVEMENT PROGRAM

Engineer Name: CHA Consulting, Inc.

PROPOSED CONSTRUCTION FEES

Fee Category	Fees Dollar ($) Value	Percentage of Hard Costs
Estimated Value of Hard Costs	4,891,724	
Project Service Fees	785,103	16.0%
Investment Grade Energy Audit	179,100	3.7%
Design Engineering Fees	341,003	7.0%
Construction Management & Project Administration	37,800	0.8%
System Commissioning	66,300	1.4%
3rd Party Review	20,000	0.4%
Design Review	40,900	0.8%
Permitting Fees	20,000	0.4%
Financiing Fees	60,000	1.2%
Reimbursable Expenses	20,000	0.4%
Engineer Overhead	0	0.0%
Engineer Profit	0	0.0%
Total Project Costs	5,676,827	
Rounding	173	
Total Financed Project Costs	5,677,000	

PROPOSED ANNUAL SERVICE FEES

First Year Annual Service Fees	Fees Dollar ($) Value	Percentage of Hard Costs
Savings Guarantee (Option)	N/A	N/A
Measurement and Verification (Associated w/ Savings Guarantee Option)	N/A	N/A
Energy Star Services (Optional)	N/A	N/A
Post Construction Services (if applicable)	N/A	N/A
Performance Monitoring	N/A	N/A
On-Going Training Services	N/A	N/A
Verification Reports	N/A	N/A
Total First Year Annual Services	N/A	N/A

FORM VI

ENGINEERING FIRM's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ENGINEER's PRELIMINARY ANNUAL CASH FLOW ANALYSIS FORM
BARNEGAT TOWNSHIP SCHOOL DISTRICT
ENERGY SAVINGS IMPROVEMENT PROGRAM

Engineer Name: CHA Consulting, Inc.

Annual Electric Inflation Rate: 2.20%
Annual Natural Gas Inflation Rate: 2.40%

1. Term of Agreement: 18 Years
2. Construction Period: 12 Months
3. Cash Flow Analysis Format:

Project Cost: $5,677,000 Interest Rate: 2.60%

Year	Annual Energy Savings	Annual Photovoltaic Savings	Annual Operational Savings	Energy Rebates / Incentives	Total Annual Savings	Annual Project Costs	Annual Service Costs	Net Cash Flow to Client	Cummulative Cash Flow
Installation									
1.	$185,088	$149,034	($1,062)	$0	$333,060	($329,973)	$ -	$3,087	$3,087
2.	$189,306	$152,779	($1,062)	$230,556	$571,579	($568,165)	$ -	$3,414	$6,500
3.	$193,620	$156,616	($1,562)	$230,556	$579,229	($575,764)	$ -	$3,465	$9,966
4.	$198,032	$160,547	($1,562)	$0	$357,017	($353,885)	$ -	$3,132	$13,098
5.	$202,545	$164,575	($1,562)	$0	$365,558	($362,580)	$ -	$2,978	$16,076
6.	$207,161	$168,703	($1,562)	$0	$374,302	($370,885)	$ -	$3,417	$19,492
7.	$211,882	$172,932	($1,562)	$0	$383,252	($379,787)	$ -	$3,465	$22,957
8.	$216,710	$177,265	($1,562)	$0	$392,413	($389,260)	$ -	$3,153	$26,110
9.	$221,648	$181,705	($1,562)	$0	$401,790	($398,291)	$ -	$3,499	$29,609
10.	$226,699	$186,254	($1,562)	$0	$411,390	($407,867)	$ -	$3,523	$33,132
11.	$231,865	$190,914	($1,562)	$0	$421,217	($417,962)	$ -	$3,255	$36,387
12.	$237,149	$195,689	($1,562)	$0	$431,276	($427,563)	$ -	$3,713	$40,100
13.	$242,553	$200,582	($1,562)	$0	$441,573	($438,644)	$ -	$2,929	$43,029
14.	$248,080	$205,595	($1,562)	$0	$452,112	($449,179)	$ -	$2,933	$45,962
15.	$253,733	$210,730	($1,562)	$0	$462,901	($459,168)	$ -	$3,733	$49,695
16.	$259,515	$0	($1,562)	$0	$257,953	($254,432)	$ -	$3,521	$53,216
17.	$265,429	$0	($1,562)	$0	$263,867	($260,088)	$ -	$3,779	$56,994
18.	$271,478	$0	($1,562)	$0	$269,916	($266,419)	$ -	$3,497	$60,491
19.	$277,664	$0	($1,562)	$0	$276,102	$0	$ -	$276,102	$336,593
20.	$283,991	$0	($1,562)	$0	$282,429	$0	$ -	$282,429	$619,021
Totals	$4,624,148	$2,673,920	($30,247)	$461,112	$7,728,933	($7,109,912)	$0	$619,021	$619,021

Appendix I: Barnegat Township Board of Education Resolution

BARNEGAT TOWNSHIP SCHOOL DISTRICT
550 BARNEGAT BOULEVARD NORTH
BARNEGAT, NEW JERSEY 08005
(609) 698-5800 FAX (609) 660-5974

Dr. Brian Latwis
Superintendent of Schools

Stephen J. Brennan, MBA, CPA
Business Administrator/Board Secretary

I, Stephen Brennan Business Administrator/Board Secretary of the Board of Education of the Township of Barnegat, in the County of Ocean, New Jersey, HEREBY CERTIFY that the foregoing resolution was duly adopted at a meeting of the Board of Education of said School District duly called and held on July 28, 2020, and is a true, complete and correct copy thereof.

Energy Savings Improvement Plan

WHEREAS, The Board of Education of the Barnegat Township School District in the County of Ocean, New Jersey (the "School District") is a political subdivision created by law, and the board of education (the "Board of Education") of the School District is charged by law with the responsibility of providing a system of public education within the School District over which it has jurisdiction and has the authority to provide Energy Conservation Measures and Equipment for the School District as permitted and authorized by law; and

WHEREAS the Board of Education previously decided to investigate implementation of an energy savings improvement program and hired the firm of CHA (the "Energy Audit Firm") to conduct energy audits of the School District facilities, and the Energy Audit Firm conducted the audits and delivered to this Board of Education energy audit reports with respect to the School District facilities; and

WHEREAS, the Board of Education determined to develop and implement an energy savings improvement program with the assistance of the School District Architect, Spiezle Architectural Group, Inc. ("Spiezle"), and

WHEREAS, the Board of Education received the Emery Savings Plan issued by CHA on June 16, 2020, subject to verification by a third party verification agent and approval by the Board of Public Utilities (the "BPU"); and

WHEREAS, the energy Savings Plan identifies $6,145,000 in available energy savings measures

WHEREAS, this Board of Education advertised for and received bids to select a third party verification agent (the "Verification Agent") to verify the energy savings to be realized through the Energy Savings Plan, the Board of Education selected Schiller and Hersh Associates to be its verification agent,

WHEREAS, after reviewing the approved Energy Savings Plan, this Board of Education wishes to reconfirm its determination that the energy savings generated from reduced energy use from the program will be sufficient to cover the cost of the program's Energy Conservation Measures, including the Equipment, set forth

BOARD OF EDUCATION
Michael Hickey, *President* Robert Geddes, *Vice President*
Doreen Continanza Sean O'Brien Maria Pereira Lauren Sarno Robert Sawicki David Sherman Richard Quelch

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Stephen J. Brennan, MBA, CPA
Business Administrator/Board Secretary

in the Energy Savings Plan and that it is in the best interest of the School District to implement the plan pursuant to N.J.S.A. 18A:18A-4.6; and

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF EDUCATION OF THE BARNEGAT TOWNSHIP SCHOOL DISTRICT IN THE COUNTY OF OCEAN, NEW JERSEY as follows:

Section 1. The Board of Education accepts the Energy Savings Plan issued by CHA dated June 30, 2020, subject to verification by a third party verification agent and approval by the Board of Public Utilities (the "BPU"); and

Section 2. Upon receipt of the third party verification report, the Board authorizes the Business Administrator to submit the Energy Savings Plan for review and approval by the Board of Public Utilities.

Section 3. The Board of Education hereby reaffirms and ratifies its determination that the energy savings generated from reduced energy use from the Energy Conservation Measures set for in the Energy Savings Plan will be sufficient to cover the cost of the program's Energy Conservation Measures, that it is in the best interest of the School District to implement the Energy Savings plan pursuant to N.J.S.A. 18A:18A-4.6 and that it reaffirms and ratifies its approval of the Energy Savings Plan in the form submitted to and approved by the BPU.

Section 4. This resolution shall take effect immediately.

Motion by: Mr. Sherman
Seconded by: Mr. Geddes

Ms. Continanza, Yes; Mr. Geddes, Yes; Mr. O'Brien, Yes; Mrs. Pereira, Yes; Mr. Quelch, Yes; Ms. Sarno, Absent; Mr. Sawicki; Yes; Mr. Sherman, Yes; Mr. Hickey, Yes.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal of said School District this 30th day of July 2020.

Stephen Brennan, MBA, CPA
Business Administrator/Board Secretary

Our collective mission is to nurture and educate our children in accordance with all curriculum standards to prepare them for responsible citizenship and success in life.

BOARD OF EDUCATION

Michael Hickey, *President* Robert Geddes, *Vice President*

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Dr. Brian Latwis
Superintendent of Schools

Stephen J. Brennan, MBA, CPA
Business Administrator/Board Secretary

I, Stephen Brennan Business Administrator/Board Secretary of the Board of Education of the Township of Barnegat, in the County of Ocean, New Jersey, HEREBY CERTIFY that the foregoing resolution was duly adopted at a meeting of the Board of Education of said School District duly called and held on July 28, 2020, and is a true, complete and correct copy thereof.

1. Motion to approve the following RESOLUTION OF THE BOARD OF EDUCATION OF THE TOWNSHIP OF BARNEGAT IN THE COUNTY OF OCEAN, NEW JERSEY MAKING APPLICATION TO THE LOCAL FINANCE BOARD PURSUANT TO N.J.S.A. 18A:18A-4.6(1)(c)(3) AND N.J.S.A. 18A:24-61.1 *ET SEQ*.

   WHEREAS, The Board of Education of the Township of Barnegat in the County of Ocean, New Jersey (the "Board of Education") desires to make application to the Local Finance Board for its approval of a School Energy Savings Obligation Refunding Bond Ordinance pursuant to N.J.S.A. 18A:18A-4.6(1)(c)(3) and N.J.S.A. 18A:24-61.1 *et seq*. in order to provide for energy conservation improvements for the school district; and

   WHEREAS, the Board of Education believes that:

   (a) it is in the public interest to accomplish such purpose;

   (b) the purpose is for the health, the welfare, the convenience or the betterment of the inhabitants of the school district;

   (c) the amounts to be expended for the purpose or the improvements are not unreasonable or exorbitant; and

   (d) the proposal is an efficient and feasible means of providing services for the needs of the inhabitants of the school district and will not create an undue financial burden to be placed upon the school district;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF EDUCATION OF THE TOWNSHIP OF BARNEGAT IN THE COUNTY OF OCEAN as follows:

Section 1. The application to the Local Finance Board is hereby approved, and the Board of Education's Bond Counsel and Financial Advisor, along with other representatives of the Board of Education, are hereby authorized to prepare such application and to represent the Board of Education in matters pertaining thereto.

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Section 2. The Business Administrator/Board Secretary of the Board of Education is hereby directed to prepare and to file a certified copy of the financing documents authorizing the Bonds with the Local Finance Board as part of such application.

Section 3. The Local Finance Board is hereby respectfully requested to consider such application and to record its findings and approval as provided by the applicable New Jersey Statutes.

Motion by: Mr. Sherman
Seconded by: Mr. Geddes

Ms. Continanza, Yes; Mr. Geddes, Yes; Mr. O'Brien, Yes; Mrs. Pereira, Yes; Mr. Quelch, Yes; Ms. Sarno, Absent; Mr. Sawicki; Yes; Mr. Sherman, Yes; Mr. Hickey, Yes.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal of said School District this 30th day of July 2020.

Stephen J. Brennan

Stephen Brennan, MBA, CPA
Business Administrator/Board Secretary

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