ENERGY SAVINGS PLAN

SUBMITTED BY:
DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648
Rev 0
5/18/2021

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ENERGY SAVINGS PLAN

SECTION 1 – PROJECT OVERVIEW

Project Overview

The Energy Savings Plan (ESP) is the core of the Energy Savings Improvement Program (ESIP) process. It describes Eatontown Board of Education's preferred Energy Conservation Measures (ECMs), the budget cost for each ECM and the ECM energy savings calculations that self-fund the project via reduced operating costs. The ESP provides Eatontown Board of Education the necessary information to decide which proposed ECMs to implement as part of your (ESIP) project. Working with the District's staff, your selected ESIP project would:

1. Self-fund $3,488,124 of building improvements
2. Generate $259,270 in annual energy savings – 55% of current utility spend
3. Qualify for $569,877 in energy efficiency rebates
4. Reduce annual CO2 emissions by 1535 metric tons – a 74% reduction

NOTE: This submitted ESP doesn't constitute any contractual obligation between Eatontown Board of Education and DCO Energy (DCO). Any contractual obligations will be performed under separate legal documents per mutual signed agreement of the parties involved and subject to the applicable laws and requirements of the ESIP legislation and State of New Jersey.

To ensure conformance with the requirements of Public Finance Notice LFN 2009-11, the ESP must address the following elements:

- *The results of the energy audit (APPENDIX G)*
- *A description of the energy conservation measures that will comprise the program; (Section 3)*
- *An estimate of greenhouse gas reductions resulting from those energy savings (Section 3);*
- *Identification of all design and compliance issues and identification of who will provide these services; (Section 5)*
- *An assessment of risks involved in the successful implementation of the plan; (Section 5)*
- *Identify the eligibility for, and costs and revenues associated with the PJM Independent System Operator for demand response and curtailable service activities; (Section 3)*
- *Schedules showing calculations of all costs of implementing the proposed energy conservation measures and the projected energy savings; (Section 3)*
- *Maintenance requirements necessary to ensure continued energy savings, and describe how they will be provided; and (Section 6)*
- *If developed by an ESCO, a description of, and cost estimates of a proposed energy savings guarantee. (Section 7)*

In addition, and per LFN 2009-11, the ESP requires several other important elements:

- *The calculations of energy savings must be made in accordance with protocols for their calculation adopted by the BPU. The calculation shall include all applicable State and federal rebates and tax credits, but shall not include the cost of an energy audit and the cost of verifying energy savings. (Section 3)*
- *An independent third party must review the plan and certify that the plan savings were properly calculated pursuant to the BPU protocols.*
- *If an ESCO is used to prepare the plan, the ESCO must provide an estimate of the cost of a guarantee of energy savings. When adopting the plan, the local unit must decide whether or not to accept the guarantee (covered below). (Section 7)*
- *The plan must be verified by an independent third party to ensure that the calculations were made in accordance with the BPU standards and that all required elements of the ESP are covered.*
- *After verification is completed, the governing body must formally adopt the plan. At that point, the plan must be submitted to the Board of Public Utilities where it will be posted on the BPU website. BPU approval is not required. If the contracting unit maintains its own website, the plan must also be posted on that site.*

DCO Energy looks forward to the third-party review of our energy calculations and Eatontown Board of Education's approval of the Energy Savings Plan to implement via the requirements of the ESIP legislation. Your time, effort, and support is appreciated.

ENERGY SAVINGS PLAN

SECTION 2 – ENERGY BASELINE

DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648

Total Utility Consumption and Site EUI

The Eatontown Board of Education Energy Savings Plan includes 5 buildings totaling 189,775 square feet. To develop the ESP, DCO Energy was provided with all available utility data (electric and natural gas). DCO Energy tracked and documented this utility data from July 2018 thru June 2019. A listing of the buildings, the total utility consumption, and Energy Usage Index for the 5 buildings is detailed below.

BUILDINGS & FACILITIES		
BUILDING #	BUILDING/FACILITY NAME	SQFT
1	**Memorial Middle School**	**58,225**
2	**Meadowbrook Elementary**	**42,605**
3	**Margaret L Vetter Elementary**	**33,635**
4	**Woodmere Elementary**	**44,510**
5	**Transportation Facility**	**10,800**

EATONTOWN BOARD OF EDUCATION BUILDINGS/FACILITIES		ELECTRIC				
BUILDING/FACILITY NAME	SQFT	USAGE kWh	DEMAND kW	USAGE BTU / SQFT	TOTAL COST $$	BLENDED COST $$ / kWh
Memorial Middle School	58,225	1,117,760	325	65,501	$129,582	$0.116
Meadowbrook Elementary	42,605	646,701	294	51,791	$78,876	$0.122
Margaret L Vetter Elementary	33,635	607,840	307	61,660	$78,171	$0.129
Woodmere Elementary	44,510	929,648	431	71,264	$112,709	$0.121
Transportation Facility	10,800	47,440	22	14,988	$5,849	$0.123
TOTALS	**189,775**	**3,349,389**	**1,379**	**60,219**	**$405,186**	**$0.121**

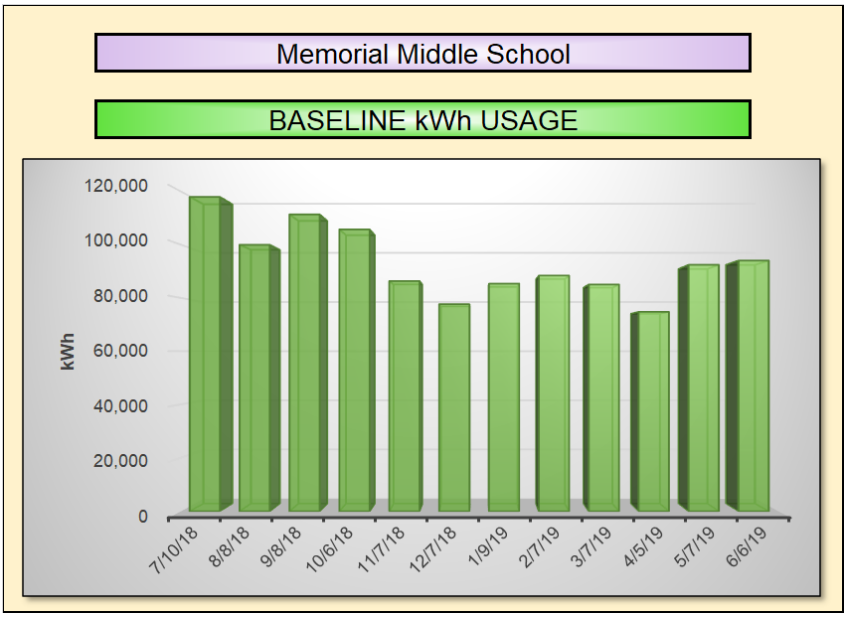
EATONTOWN BOARD OF EDUCATION BUILDINGS/FACILITIES		NATURAL GAS			
BUILDING/FACILITY NAME	SQFT	USAGE THERMS	USAGE BTU / SQFT	TOTAL COST $$	BLENDED COST $$ / THERM
Memorial Middle School	58,225	20,359	34,967	$19,102	$0.94
Meadowbrook Elementary	42,605	18,134	42,564	$18,181	$1.00
Margaret L Vetter Elementary	33,635	22,092	65,683	$19,228	$0.87
Woodmere Elementary	44,510	5,003	11,241	$3,749	$0.75
Transportation Facility	10,800	10,559	97,772	$10,218	$0.97
TOTALS	**189,775**	**76,149**	**40,126**	**$70,477**	**$0.93**

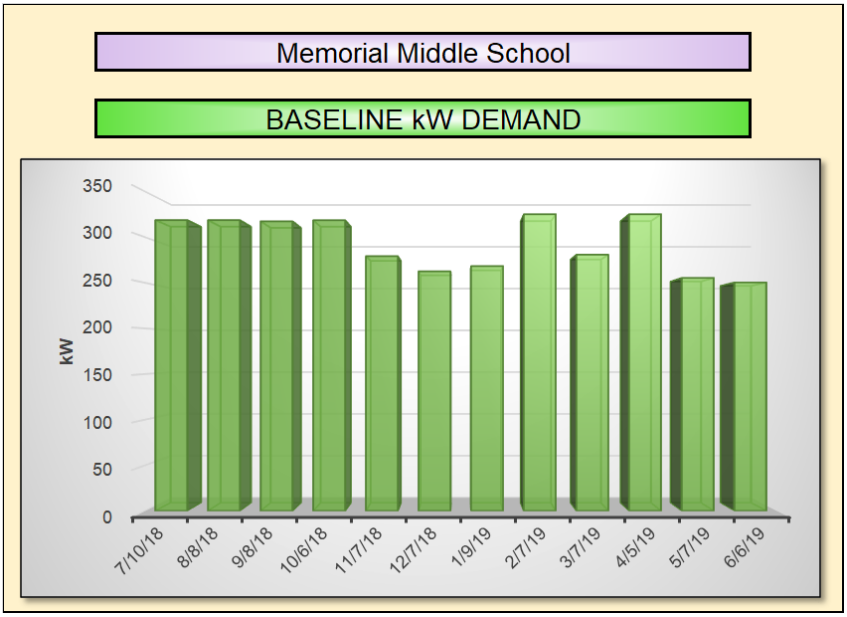
EATONTOWN BOARD OF EDUCATION BUILDINGS/FACILITIES		SITE ENERGY	SOURCE ENERGY	TOTAL COST
BUILDING/FACILITY NAME	SQFT	USAGE BTUs	USAGE BTUs	$$
Memorial Middle School	58,225	5,849,723,120	12,816,354,236	$148,683
Meadowbrook Elementary	42,605	4,019,989,812	8,082,440,974	$97,057
Margaret L Vetter Elementary	33,635	4,283,187,080	8,126,759,074	$97,398
Woodmere Elementary	44,510	3,672,285,976	9,406,828,483	$116,458
Transportation Facility	10,800	1,217,805,280	1,561,959,784	$16,067
TOTALS	**189,775**	**19,042,991,268**	**39,994,342,550**	**$475,664**

EATONTOWN BOARD OF EDUCATION BUILDINGS/FACILITIES		SITE EUI			SITE ECI		
BUILDING/FACILITY NAME	SQFT	USAGE BTU / SQFT	NATIONAL MEDIAN BTU / SQFT	NATIONAL MEDIAN +/- %	COST $$ / SQFT	NATIONAL MEDIAN $$ / SQFT	NATIONAL MEDIAN +/- %
Memorial Middle School	58,225	100,468	68,800	-46%	$2.55	$1.38	-85%
Meadowbrook Elementary	42,605	94,355	68,800	-37%	$2.28	$1.38	-65%
Margaret L Vetter Elementary	33,635	127,343	68,800	-85%	$2.90	$1.38	-110%
Woodmere Elementary	44,510	82,505	68,800	-20%	$2.62	$1.38	-90%
Transportation Facility	10,800	112,760	58,700	-92%	$1.49	$1.18	-26%
TOTALS	**189,775**	**100,345**	**68,225**	**-47%**	**$2.51**	**$1.37**	**-83%**

On the following pages is a detailed account of each of the utility accounts and meters provided to DCO Energy.

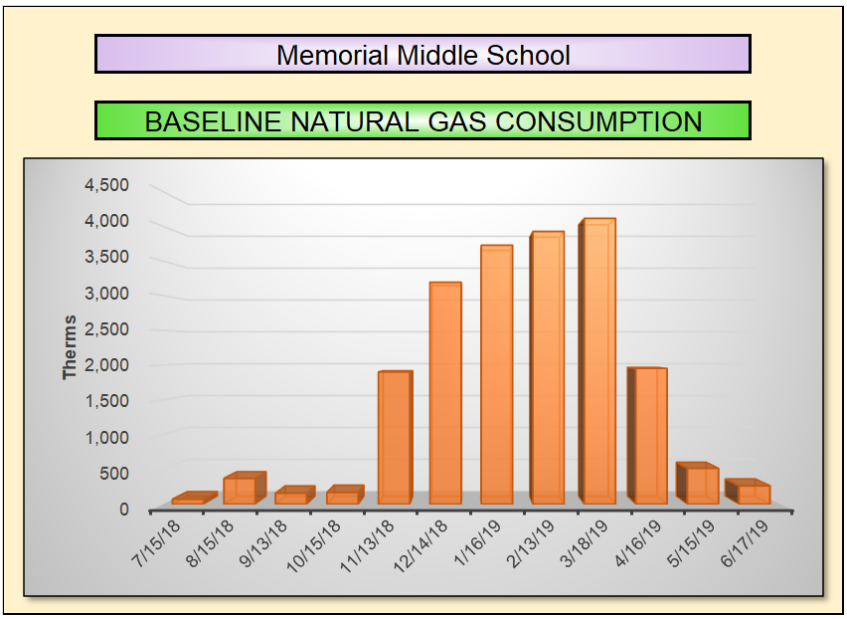
Memorial Middle School Baseline Energy Use





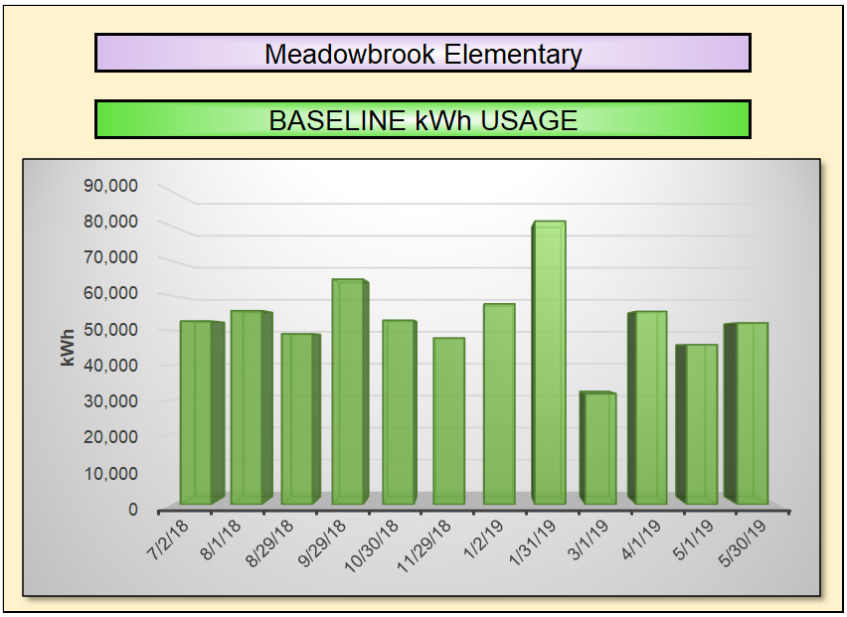
Memorial Middle School							ELECTRIC METER #1					
Provider:	JCP&L			Account #:	100 015 727 538				Meter #:	G21163261		
Commodity:	JCP&L Basic Generation			Description:	7 Grant Ave				Rate Tariff:	General Service Secondary 3 Phase		
Billing Period Start Date	Actual Reading	Usage kWh Net	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	$ / kWh Marginal Rate	Days	Load Factor	BTU
6/8/18	7/10/18	117,760	319	$11	$2,175	$8,637	$2,078	$12,901	$0.0918	33	47%	401,797,120
7/11/18	8/8/18	99,840	319	$11	$1,860	$7,323	$2,078	$11,272	$0.092	29	45%	340,654,080
8/9/18	9/8/18	111,200	317	$11	$2,064	$8,156	$2,069	$12,300	$0.092	31	47%	379,414,400
9/9/18	10/6/18	105,600	319	$11	$1,922	$9,204	$1,935	$13,072	$0.105	28	49%	360,307,200
10/7/18	11/7/18	86,240	279	$11	$2,056	$7,516	$1,688	$11,272	$0.111	32	40%	294,250,880
11/8/18	12/7/18	77,600	263	$11	$1,325	$6,763	$1,584	$9,683	$0.104	30	41%	264,771,200
12/8/18	1/9/19	85,280	268	$11	$1,432	$6,510	$1,620	$9,573	$0.093	33	40%	290,975,360
1/10/19	2/7/19	88,320	325	$11	$1,432	$6,935	$1,976	$10,354	$0.095	29	39%	301,347,840
2/8/19	3/7/19	84,960	281	$11	$1,380	$6,486	$1,698	$9,575	$0.093	28	45%	289,883,520
3/8/19	4/5/19	74,720	325	$11	$1,220	$5,704	$1,976	$8,911	$0.093	29	33%	254,944,640
4/6/19	5/7/19	92,320	255	$11	$1,741	$7,048	$1,539	$10,339	$0.095	32	47%	314,995,840
5/8/19	6/6/19	93,920	250	$11	$1,550	$7,170	$1,599	$10,330	$0.093	30	52%	320,455,040
TOTALS		1,117,760	325	$135	$20,156	$87,453	$21,837	$129,582	$0.096	364	39%	3,813,797,120

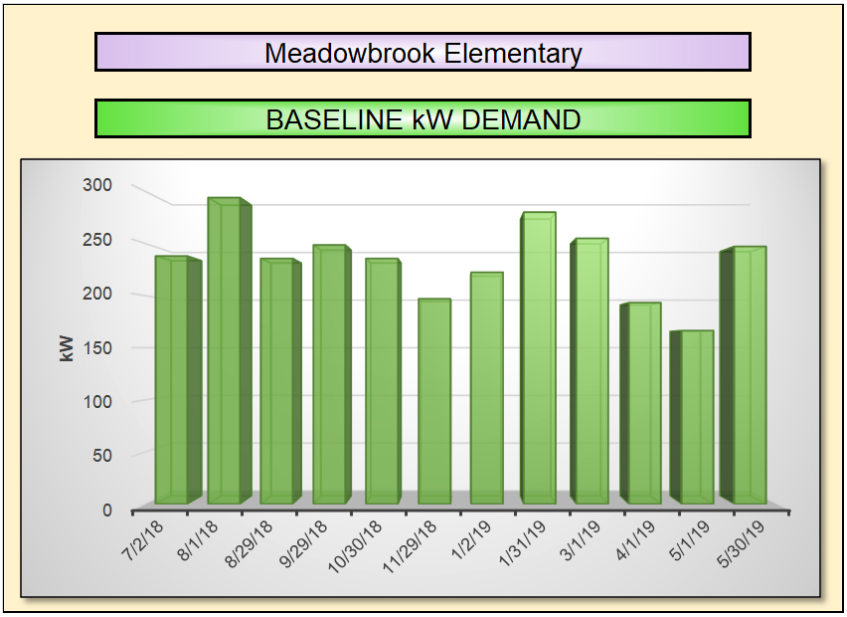
Memorial Middle School												
TOTAL ELECTRIC												
Usage kWh	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	Cost / kW Checksum	Cost / kWh Checksum	Total Cost / kWh Checksum	Days	Load Factor	BTU
117,760	319	$11	$2,175	$8,637	$2,078	$12,901	$6.52	$0.092	$0.110	33	47%	401,797,120
99,840	319	$11	$1,860	$7,323	$2,078	$11,272	$6.52	$0.092	$0.113	29	45%	340,654,080
111,200	317	$11	$2,064	$8,156	$2,069	$12,300	$6.52	$0.092	$0.111	31	47%	379,414,400
105,600	319	$11	$1,922	$9,204	$1,935	$13,072	$6.07	$0.105	$0.124	28	49%	360,307,200
86,240	279	$11	$2,056	$7,516	$1,688	$11,272	$6.05	$0.111	$0.131	32	40%	294,250,880
77,600	263	$11	$1,325	$6,763	$1,584	$9,683	$6.03	$0.104	$0.125	30	41%	264,771,200
85,280	268	$11	$1,432	$6,510	$1,620	$9,573	$6.04	$0.093	$0.112	33	40%	290,975,360
88,320	325	$11	$1,432	$6,935	$1,976	$10,354	$6.08	$0.095	$0.117	29	39%	301,347,840
84,960	281	$11	$1,380	$6,486	$1,698	$9,575	$6.05	$0.093	$0.113	28	45%	289,883,520
74,720	325	$11	$1,220	$5,704	$1,976	$8,911	$6.08	$0.093	$0.119	29	33%	254,944,640
92,320	255	$11	$1,741	$7,048	$1,539	$10,339	$6.02	$0.095	$0.112	32	47%	314,995,840
93,920	250	$11	$1,550	$7,170	$1,599	$10,330	$6.39	$0.093	$0.110	30	52%	320,455,040
1,117,760	325	$135	$20,156	$87,453	$21,837	$129,582	$6.20	$0.0963	$0.1159	364	39%	3,813,797,120



Memorial Middle School								Natural Gas Meter #1	
Provider	NJNG		Account #	14-3271-3670-19				Meter #	00810909
Commodity	NJNG		Description					Rate Tariff:	General Service Large
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Customer Charge	Gas Demand Charge	Gas Commodity Charges	Gas Total Charges	$/Therm Marginal Rate	BTU
6/15/18	7/15/18	72	$32	$50	$257	$0	$338	$0.44	7,221,000
7/16/18	8/15/18	372	$257	$50	$257	$0	$564	$0.69	37,247,000
8/16/18	9/13/18	159	$70	$50	$257	$0	$376	$0.44	15,933,000
9/14/18	10/15/18	170	$73	$51	$321	$0	$445	$0.43	16,976,000
10/16/18	11/13/18	1,902	$814	$52	$321	$0	$1,186	$0.43	190,167,000
11/14/18	12/14/18	3,192	$1,366	$52	$321	$0	$1,739	$0.43	319,235,000
12/15/18	1/16/19	3,725	$1,569	$52	$321	$2,199	$4,141	$1.01	372,523,000
1/17/19	2/13/19	3,922	$1,627	$52	$321	$1,997	$3,996	$0.92	392,246,000
2/14/19	3/18/19	4,111	$1,705	$63	$385	$1,904	$4,056	$0.88	411,052,000
3/19/19	4/16/19	1,953	$815	$52	$321	$0	$1,187	$0.42	195,273,000
4/17/19	5/15/19	516	$216	$52	$321	$0	$589	$0.42	51,570,000
5/16/19	6/17/19	265	$111	$52	$321	$0	$484	$0.42	26,483,000
TOTALS		20,359	$8,654	$629	$3,720	$6,099	$19,102	$0.72	2,035,926,000

Meadowbrook Elementary Baseline Energy Use

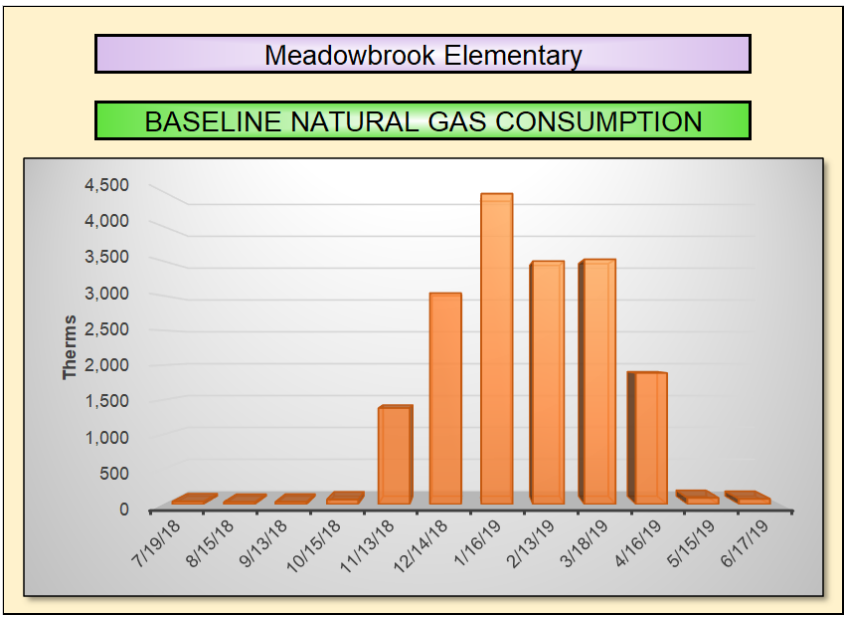




Meadowbrook Elementary							ELECTRIC METER #1					
Provider:	JCP&L			Account #:	100 014 077 927				Meter #:	G72948179		
Commodity:	JCP&L Basic Generation			Description:	65 Wyckoff Rd				Rate Tariff:	General Service Secondary 3 Phase		
Billing Period Start Date	Actual Reading	Usage kWh Net	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	$ / kWh Marginal Rate	Days	Load Factor	BTU
6/1/18	7/2/18	51,680	223	$11	$984	$3,791	$1,431	$6,217	$0.092	32	30%	176,332,160
7/3/18	8/1/18	54,560	279	$11	$1,042	$4,002	$1,808	$6,863	$0.092	30	27%	186,158,720
8/2/18	8/29/18	48,000	220	$11	$923	$3,521	$1,415	$5,870	$0.093	28	32%	163,776,000
8/30/18	9/29/18	63,680	233	$11	$1,187	$4,671	$1,400	$7,270	$0.092	31	37%	217,276,160
9/30/18	10/30/18	51,040	220	$11	$949	$4,449	$1,319	$6,727	$0.106	31	31%	174,148,480
10/31/18	11/29/18	44,320	182	$11	$780	$3,863	$1,076	$5,730	$0.105	30	34%	151,219,840
11/30/18	1/2/19	52,640	207	$11	$913	$4,019	$1,235	$6,178	$0.094	34	31%	179,607,680
1/3/19	1/31/19	75,840	257	$11	$1,237	$5,790	$1,551	$8,589	$0.093	29	42%	258,766,080
2/1/19	3/1/19	28,640	232	$11	$499	$2,186	$1,393	$4,090	$0.094	29	18%	97,719,680
3/2/19	4/1/19	51,840	169	$11	$862	$3,957	$999	$5,830	$0.093	31	41%	176,878,080
4/2/19	5/1/19	44,000	153	$11	$827	$3,359	$894	$5,091	$0.095	30	40%	150,128,000
5/2/19	5/30/19	50,880	233	$11	$922	$3,884	$1,490	$6,307	$0.094	29	31%	173,602,560
TOTALS		617,120	279	$136	$11,124	$47,490	$16,012	$74,762	$0.095	364	25%	2,105,613,440

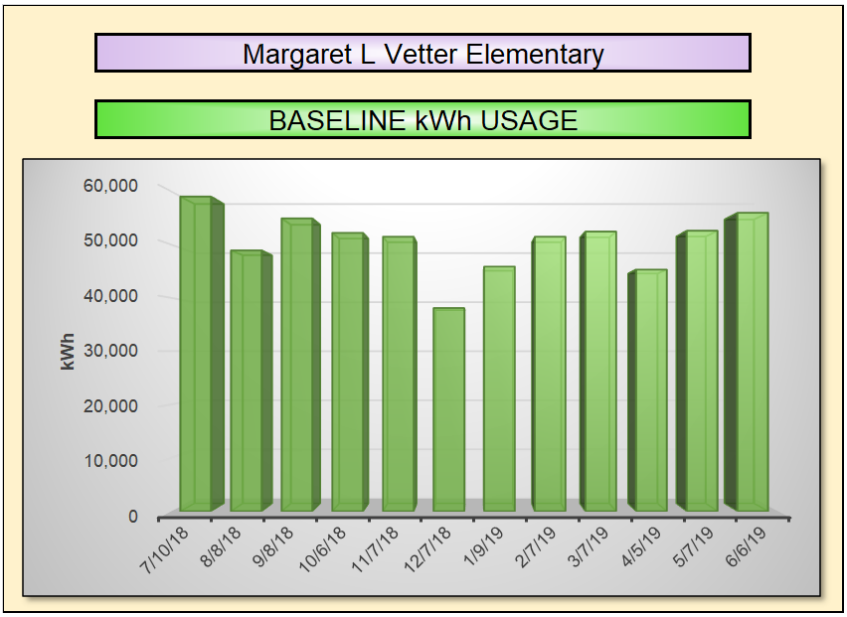
Meadowbrook Elementary							ELECTRIC METER #2					
Provider:	JCP&L			Account #:	100 014 077 836				Meter #:	G72948179		
Commodity:	JCP&L Basic Generation			Description:	Trailer Behind School Wyckoff Rd				Rate Tariff:	General Service Secondary		
Billing Period Start Date	Actual Reading	Usage kWh Net	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	$ / kWh Marginal Rate	Days	Load Factor	BTU
6/1/18	7/2/18	966	15	$3	$71	$71	$47	$192	$0.147	32	8%	3,295,992
7/3/18	8/1/18	1,068	15	$3	$75	$78	$47	$203	$0.143	30	10%	3,644,016
8/2/18	8/29/18	997	15	$3	$73	$73	$47	$196	$0.147	28	10%	3,401,764
8/30/18	9/29/18	974	15	$3	$67	$71	$47	$189	$0.142	31	9%	3,323,288
9/30/18	10/30/18	1,829	15	$3	$83	$159	$47	$293	$0.133	31	16%	6,240,548
10/31/18	11/29/18	3,476	15	$3	$108	$303	$47	$461	$0.118	30	31%	11,860,112
11/30/18	1/2/19	4,921	15	$3	$131	$376	$47	$557	$0.103	34	39%	16,790,452
1/3/19	1/31/19	5,503	23	$3	$137	$420	$80	$640	$0.101	29	35%	18,776,236
2/1/19	3/1/19	3,156	23	$3	$100	$241	$80	$425	$0.108	29	20%	10,768,272
3/2/19	4/1/19	3,581	24	$3	$107	$273	$87	$471	$0.106	31	20%	12,218,372
4/2/19	5/1/19	1,854	14	$3	$84	$142	$42	$271	$0.121	30	19%	6,325,848
5/2/19	5/30/19	1,256	14	$3	$76	$96	$42	$217	$0.137	29	13%	4,285,472
TOTALS		29,581	24	$38	$1,112	$2,304	$661	$4,115	$0.115	364	14%	100,930,372

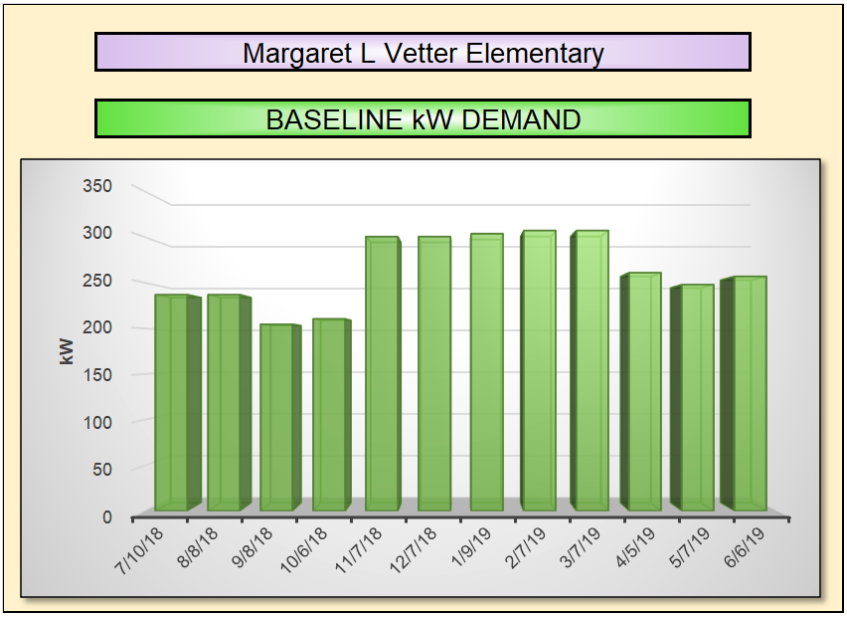
Meadowbrook Elementary												
TOTAL ELECTRIC												
Usage kWh	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	Cost / kW Checksum	Cost / kWh Checksum	Total Cost / kWh Checksum	Days	Load Factor	BTU
52,646	238	$14	$1,055	$3,861	$1,478	$6,409	$6.21	$0.093	$0.122	32	29%	179,628,152
55,628	294	$14	$1,116	$4,080	$1,855	$7,066	$6.31	$0.093	$0.127	30	26%	189,802,736
48,997	236	$14	$996	$3,594	$1,462	$6,067	$6.20	$0.094	$0.124	28	31%	167,177,764
64,654	249	$14	$1,254	$4,742	$1,447	$7,458	$5.82	$0.093	$0.115	31	35%	220,599,448
52,869	236	$14	$1,032	$4,608	$1,366	$7,020	$5.79	$0.107	$0.133	31	30%	180,389,028
47,796	197	$14	$888	$4,166	$1,123	$6,191	$5.70	$0.106	$0.130	30	34%	163,079,952
57,561	222	$14	$1,044	$4,394	$1,282	$6,735	$5.77	$0.094	$0.117	34	32%	196,398,132
81,343	280	$14	$1,374	$6,210	$1,631	$9,229	$5.82	$0.093	$0.113	29	42%	277,542,316
31,796	255	$14	$599	$2,427	$1,473	$4,514	$5.78	$0.095	$0.142	29	18%	108,487,952
55,421	193	$14	$969	$4,231	$1,087	$6,300	$5.62	$0.094	$0.114	31	39%	189,096,452
45,854	167	$14	$911	$3,500	$937	$5,362	$5.62	$0.096	$0.117	30	38%	156,453,848
52,136	247	$14	$998	$3,980	$1,533	$6,525	$6.20	$0.095	$0.125	29	30%	177,888,032
646,701	294	$173	$12,236	$49,794	$16,673	$78,876	$5.93	$0.0959	$0.1220	364	25%	2,206,543,812



Meadowbrook Elementary								Natural Gas Meter #1	
Provider	NJNG		Account #	14-3271-7800-14				Meter #	00945033
Commodity	NJNG		Commodity					Rate Tariff:	General Service Large
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Customer Charge	Gas Demand Charge	Gas Commodity Charges	Gas Total Charges	$/Therm Marginal Rate	BTU
6/15/18	7/19/18	40	$18	$50	$319	$0	$386	$0.44	4,025,000
7/20/18	8/15/18	32	$14	$50	$319	$0	$383	$0.44	3,203,000
8/16/18	9/13/18	33	$15	$50	$319	$0	$383	$0.44	3,329,000
9/14/18	10/15/18	69	$30	$51	$319	$0	$399	$0.43	6,885,000
10/16/18	11/13/18	1,383	$592	$52	$319	$0	$962	$0.43	138,260,000
11/14/18	12/14/18	3,037	$1,299	$52	$319	$0	$1,670	$0.43	303,654,000
12/15/18	1/16/19	4,466	$1,882	$52	$319	$2,636	$4,889	$1.01	446,645,000
1/17/19	2/13/19	3,497	$1,450	$52	$319	$1,780	$3,601	$0.92	349,670,000
2/14/19	3/18/19	3,523	$1,461	$63	$382	$1,632	$3,537	$0.88	352,296,000
3/19/19	4/16/19	1,887	$787	$52	$319	$0	$1,158	$0.42	188,708,000
4/17/19	5/15/19	91	$38	$52	$319	$0	$409	$0.42	9,052,000
5/16/19	6/17/19	77	$32	$52	$319	$0	$403	$0.42	7,719,000
TOTALS		18,134	$7,617	$629	$3,887	$6,047	$18,181	$0.75	1,813,446,000

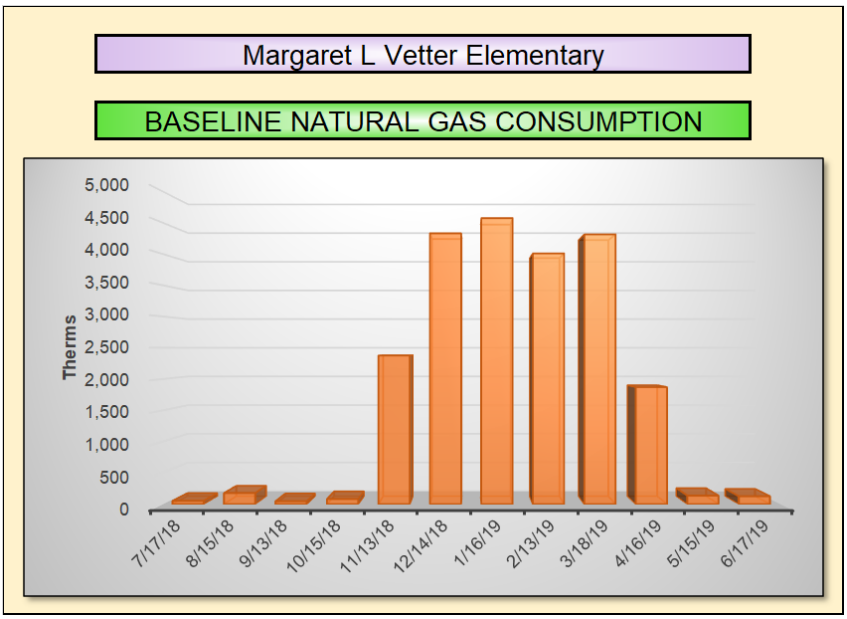
Margaret L Vetter Elementary Baseline Energy Use





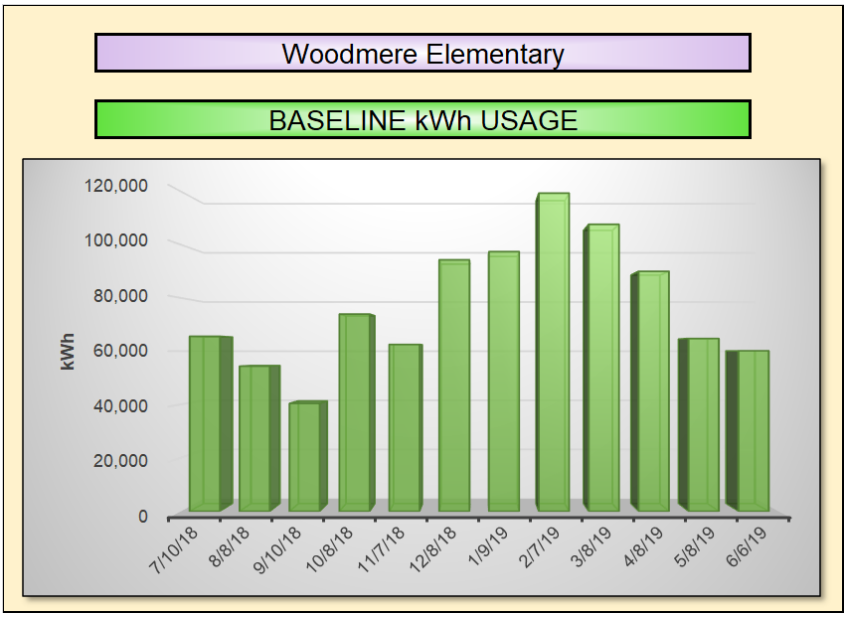
Margaret L Vetter Elementary							ELECTRIC METER #1					
Provider:	JCP&L			Account #:	100 015 727 462				Meter #:	G28635663		
Commodity:	JCP&L Basic Generation			Commodity:	3 Grant Ave				Rate Tariff:	General Service Secondary 3 Phase		
Billing Period Start Date	Actual Reading	Usage kWh Net	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	$ / kWh Marginal Rate	Days	Load Factor	BTU
6/8/18	7/10/18	58,960	237	$11	$1,117	$4,325	$1,528	$6,980	$0.092	33	31%	201,171,520
7/11/18	8/8/18	48,880	237	$11	$939	$3,585	$1,528	$6,063	$0.093	29	30%	166,778,560
8/9/18	9/8/18	54,880	205	$11	$1,047	$4,025	$1,310	$6,393	$0.092	31	36%	187,250,560
9/9/18	10/6/18	52,160	211	$11	$975	$4,546	$1,258	$6,790	$0.106	28	37%	177,969,920
10/7/18	11/7/18	51,440	301	$11	$942	$4,483	$1,822	$7,259	$0.105	32	22%	175,513,280
11/8/18	12/7/18	38,080	301	$11	$676	$3,319	$1,822	$5,828	$0.105	30	18%	129,928,960
12/8/18	1/9/19	45,840	304	$11	$793	$3,499	$1,842	$6,146	$0.094	33	19%	156,406,080
1/10/19	2/7/19	51,440	307	$11	$855	$4,034	$1,864	$6,765	$0.095	29	24%	175,513,280
2/8/19	3/7/19	52,400	307	$11	$870	$4,000	$1,864	$6,746	$0.093	28	25%	178,788,800
3/8/19	4/5/19	45,280	261	$11	$759	$3,457	$1,574	$5,801	$0.093	29	25%	154,495,360
4/6/19	5/7/19	52,560	248	$11	$1,013	$4,012	$1,492	$6,529	$0.096	32	28%	179,334,720
5/8/19	6/6/19	55,920	257	$11	$945	$4,269	$1,643	$6,869	$0.093	30	30%	190,799,040
TOTALS		607,840	307	$135	$10,932	$47,556	$19,547	$78,171	$0.096	364	23%	2,073,950,080

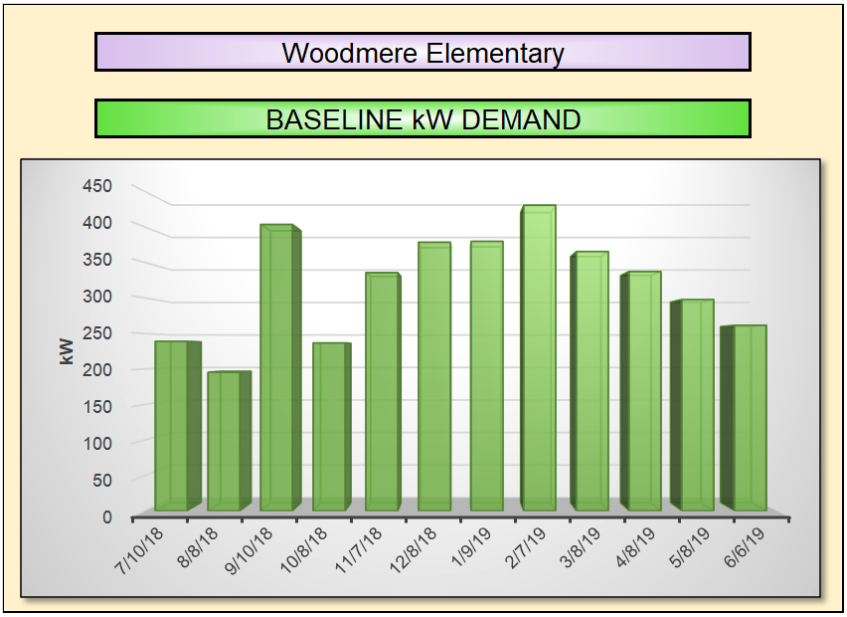
Margaret L Vetter Elementary												
TOTAL ELECTRIC												
Usage kWh	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	Cost / kW Checksum	Cost / kWh Checksum	Total Cost / kWh Checksum	Days	Load Factor	BTU
58,960	237	$11	$1,117	$4,325	$1,528	$6,980	$6.45	$0.092	$0.118	33	31%	201,171,520
48,880	237	$11	$939	$3,585	$1,528	$6,063	$6.45	$0.093	$0.124	29	30%	166,778,560
54,880	205	$11	$1,047	$4,025	$1,310	$6,393	$6.40	$0.092	$0.116	31	36%	187,250,560
52,160	211	$11	$975	$4,546	$1,258	$6,790	$5.97	$0.106	$0.130	28	37%	177,969,920
51,440	301	$11	$942	$4,483	$1,822	$7,259	$6.06	$0.105	$0.141	32	22%	175,513,280
38,080	301	$11	$676	$3,319	$1,822	$5,828	$6.06	$0.105	$0.153	30	18%	129,928,960
45,840	304	$11	$793	$3,499	$1,842	$6,146	$6.06	$0.094	$0.134	33	19%	156,406,080
51,440	307	$11	$855	$4,034	$1,864	$6,765	$6.07	$0.095	$0.132	29	24%	175,513,280
52,400	307	$11	$870	$4,000	$1,864	$6,746	$6.07	$0.093	$0.129	28	25%	178,788,800
45,280	261	$11	$759	$3,457	$1,574	$5,801	$6.03	$0.093	$0.128	29	25%	154,495,360
52,560	248	$11	$1,013	$4,012	$1,492	$6,529	$6.02	$0.096	$0.124	32	28%	179,334,720
55,920	257	$11	$945	$4,269	$1,643	$6,869	$6.39	$0.093	$0.123	30	30%	190,799,040
607,840	307	$135	$10,932	$47,556	$19,547	$78,171	$6.16	$0.0962	$0.1286	364	23%	2,073,950,080



Margaret L Vetter Elementary								Natural Gas Meter #1	
Provider	NJNG		Account #	14-3271-3650-13				Meter #	00544322
Commodity	NJNG		Commodity					Rate Tariff:	General Service Large
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Customer Charge	Gas Demand Charge	Gas Commodity Charges	Gas Total Charges	$/Therm Marginal Rate	BTU
6/15/18	7/17/18	54	$24	$50	$226	$0	$300	$0.44	5,392,000
7/18/18	8/15/18	178	$78	$50	$226	$0	$354	$0.44	17,830,000
8/16/18	9/13/18	48	$21	$50	$226	$0	$297	$0.44	4,766,000
9/14/18	10/15/18	83	$36	$51	$206	$0	$293	$0.43	8,327,000
10/16/18	11/13/18	2,376	$1,017	$52	$206	$0	$1,274	$0.43	237,607,000
11/14/18	12/14/18	4,329	$1,852	$52	$206	$0	$2,110	$0.43	432,858,000
12/15/18	1/16/19	4,571	$1,926	$52	$206	$2,698	$4,881	$1.01	457,101,000
1/17/19	2/13/19	4,008	$1,662	$52	$206	$2,040	$3,960	$0.92	400,773,000
2/14/19	3/18/19	4,311	$1,788	$63	$247	$1,997	$4,094	$0.88	431,131,000
3/19/19	4/16/19	1,870	$780	$52	$206	$0	$1,038	$0.42	187,016,000
4/17/19	5/15/19	138	$58	$52	$206	$0	$316	$0.42	13,778,000
5/16/19	6/17/19	127	$53	$52	$206	$0	$311	$0.42	12,658,000
TOTALS		22,092	$9,294	$629	$2,570	$6,734	$19,228	$0.73	2,209,237,000

Woodmere Elementary Baseline Energy Use

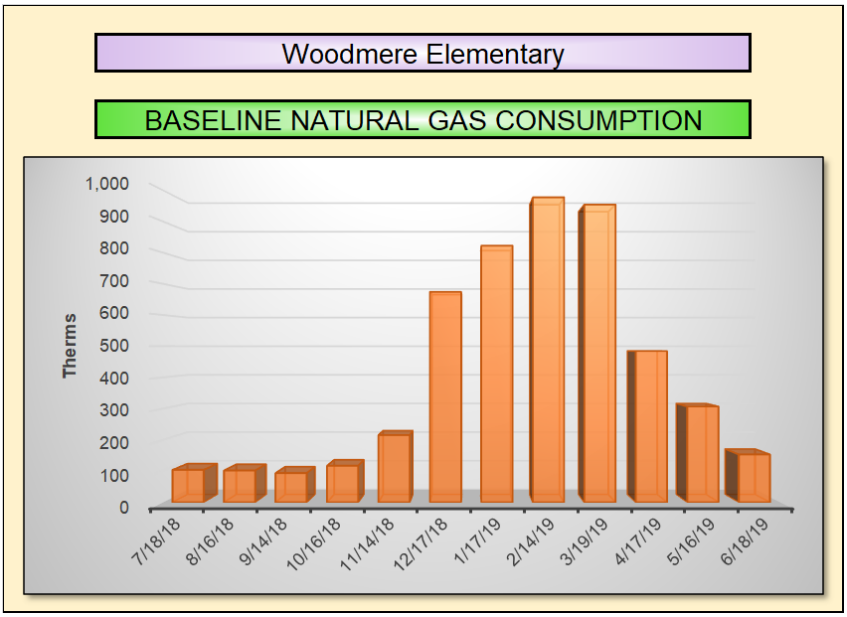




Woodmere Elementary							ELECTRIC METER #1					
Provider:	JCP&L			Account #:	100 016 355 834				Meter #:	G28408047		
Commodity:	General Service Secondary			Description:	65 Raleigh CT				Rate Tariff:	General Service Secondary 3 Phase		
Billing Period Start Date	Actual Reading	Usage kWh Net	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	$ / kWh Marginal Rate	Days	Load Factor	BTU
6/8/18	7/10/18	65,440	239	$11	$1,233	$4,800	$1,541	$7,586	$0.092	33	35%	223,281,280
7/11/18	8/8/18	54,240	195	$11	$1,836	$3,178	$1,248	$6,273	$0.092	29	40%	185,066,880
8/9/18	9/10/18	40,320	404	$11	$783	$2,957	$1,231	$4,983	$0.093	33	13%	137,571,840
9/11/18	10/8/18	73,760	237	$11	$1,357	$6,429	$1,422	$9,219	$0.106	28	46%	251,669,120
10/9/18	11/7/18	62,400	336	$11	$1,131	$5,439	$2,043	$8,624	$0.105	30	26%	212,908,800
11/8/18	12/8/18	94,080	379	$11	$1,595	$8,200	$2,311	$12,117	$0.104	31	33%	321,000,960
12/9/18	1/9/19	97,120	380	$11	$1,623	$7,414	$2,319	$11,367	$0.093	32	33%	331,373,440
1/10/19	2/7/19	119,040	431	$11	$1,913	$9,326	$2,638	$13,888	$0.094	29	40%	406,164,480
2/8/19	3/8/19	107,360	365	$11	$1,730	$8,196	$2,228	$12,166	$0.092	29	42%	366,312,320
3/9/19	4/8/19	89,760	337	$11	$1,455	$6,852	$2,052	$10,370	$0.093	31	36%	306,261,120
4/9/19	5/8/19	64,640	298	$11	$4,384	$1,805	$1,805	$8,006	$0.096	30	30%	220,551,680
5/9/19	6/6/19	60,000	262	$11	$1,002	$4,580	$1,673	$7,267	$0.093	29	33%	204,720,000
TOTALS		928,160	431	$135	$20,042	$69,177	$22,511	$111,865	$0.096	364	25%	3,166,881,920

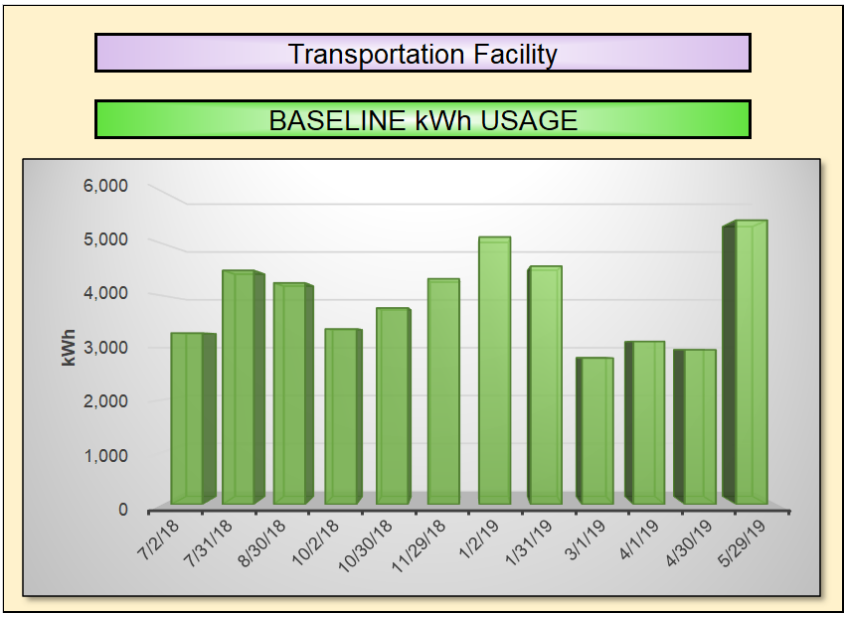
Woodmere Elementary							ELECTRIC METER #2					
Provider:	JCP&L			Account #:	100 016 355 834				Meter #:	Unmetered Outdoor Lighting		
Commodity:	JCP&L Basic Generation			Description:	65 Raleigh CT				Rate Tariff:	General Service Secondary		
Billing Period Start Date	Actual Reading	Usage kWh Net	Demand kW	Fixture Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	$ / kWh Marginal Rate	Days	Load Factor	BTU
6/8/18	7/10/18	124		$56	$14			$70	$0.111	33	0%	423,088
7/11/18	8/8/18	124		$55	$14			$69	$0.112	29	0%	423,088
8/9/18	9/10/18	124		$56	$14			$70	$0.115	33	0%	423,088
9/11/18	10/8/18	124		$56	$16			$72	$0.128	28	0%	423,088
10/9/18	11/7/18	124		$56	$16			$72	$0.128	30	0%	423,088
11/8/18	12/8/18	124		$56	$15			$71	$0.125	31	0%	423,088
12/9/18	1/9/19	124		$56	$14			$70	$0.117	32	0%	423,088
1/10/19	2/7/19	124		$56	$14			$70	$0.116	29	0%	423,088
2/8/19	3/8/19	124		$56	$15			$70	$0.118	29	0%	423,088
3/9/19	4/8/19	124		$56	$15			$71	$0.123	31	0%	423,088
4/9/19	5/8/19	124		$56	$16			$71	$0.126	30	0%	423,088
5/9/19	6/6/19	124		$55	$12			$68	$0.100	29	0%	423,088
TOTALS		1,488	0	$668	$176	$0	$0	$844	$0.118	364	0%	5,077,056

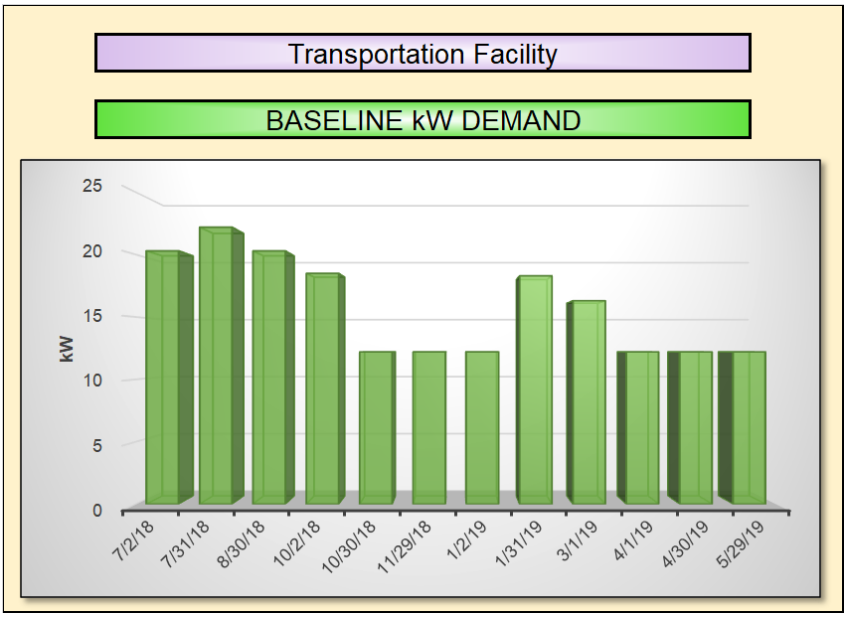
Woodmere Elementary												
TOTAL ELECTRIC												
Usage kWh	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	Cost / kW Checksum	Cost / kWh Checksum	Total Cost / kWh Checksum	Days	Load Factor	BTU
65,564	239	$67	$1,247	$4,800	$1,541	$7,655	$6.45	$0.092	$0.117	33	35%	223,704,368
54,364	195	$66	$1,850	$3,178	$1,248	$6,342	$6.39	$0.092	$0.117	29	40%	185,489,968
40,444	404	$67	$797	$2,957	$1,231	$5,053	$3.05	$0.093	$0.125	33	13%	137,994,928
73,884	237	$67	$1,373	$6,429	$1,422	$9,291	$6.01	$0.106	$0.126	28	46%	252,092,208
62,524	336	$67	$1,147	$5,439	$2,043	$8,696	$6.08	$0.105	$0.139	30	26%	213,331,888
94,204	379	$67	$1,611	$8,200	$2,311	$12,189	$6.10	$0.104	$0.129	31	33%	321,424,048
97,244	380	$67	$1,638	$7,414	$2,319	$11,438	$6.10	$0.093	$0.118	32	33%	331,796,528
119,164	431	$67	$1,927	$9,326	$2,638	$13,958	$6.12	$0.094	$0.117	29	40%	406,587,568
107,484	365	$67	$1,745	$8,196	$2,228	$12,236	$6.10	$0.092	$0.114	29	42%	366,735,408
89,884	337	$67	$1,470	$6,852	$2,052	$10,442	$6.08	$0.093	$0.116	31	36%	306,684,208
64,764	298	$67	$4,400	$1,805	$1,805	$8,077	$6.06	$0.096	$0.125	30	30%	220,974,768
60,124	262	$66	$1,014	$4,580	$1,673	$7,334	$6.40	$0.093	$0.122	29	33%	205,143,088
929,648	431	$803	$20,218	$69,177	$22,511	$112,709	$5.83	$0.0962	$0.1212	364	25%	3,171,958,976



Woodmere Elementary								Natural Gas Meter #1	
Provider	NJNG		Account #	12-3253-9100-14				Meter #	00811377
Commodity	NJNG		Account #					Meter #	General Service Small
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Customer Charge	Gas Demand Charge	Gas Commodity Charges	Gas Total Charges	$/Therm Marginal Rate	BTU
6/18/18	7/18/18	104	$54	$26	$0	$0	$80	$0.51	10,415,000
7/19/18	8/16/18	102	$53	$26	$0	$0	$79	$0.51	10,224,000
8/17/18	9/14/18	94	$48	$26	$0	$0	$74	$0.51	9,394,000
9/15/18	10/16/18	117	$58	$26	$0	$0	$84	$0.49	11,724,000
10/17/18	11/14/18	215	$103	$26	$0	$0	$129	$0.48	21,539,000
11/15/18	12/17/18	674	$321	$26	$0	$0	$347	$0.48	67,384,000
12/18/18	1/17/19	822	$385	$26	$0	$300	$711	$0.83	82,192,000
1/18/19	2/14/19	976	$452	$26	$0	$380	$858	$0.85	97,648,000
2/15/19	3/19/19	953	$442	$32	$0	$394	$867	$0.88	95,337,000
3/20/19	4/17/19	484	$226	$26	$0	$0	$252	$0.47	48,436,000
4/18/19	5/16/19	307	$144	$26	$0	$0	$170	$0.47	30,686,000
5/17/19	6/18/19	153	$71	$26	$0	$0	$98	$0.46	15,348,000
TOTALS		5,003	$2,355	$321	$0	$1,073	$3,749	$0.69	500,327,000

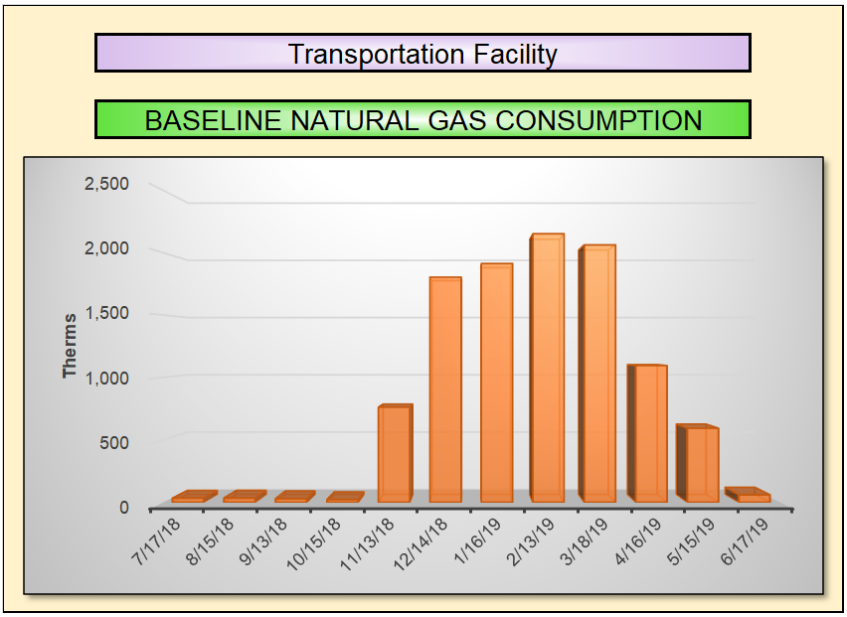
Transportation Facility Baseline Energy Use





Transportation Facility							ELECTRIC METER #1					
Provider:	JCP&L			Account #:	100 015 682 170				Meter #:	S309628059		
Commodity:	JCP&L Basic Generation			Description:	250 Pinebrook Rd				Rate Tariff:	General Service Secondary 3 Phase		
Billing Period Start Date	Actual Reading	Usage kWh Net	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	$ / kWh Marginal Rate	Days	Load Factor	BTU
6/1/18	7/2/18	5,280	20	$11	$150	$387	$69	$618	$0.102	32	21%	11,191,360
7/3/18	7/31/18	3,280	22	$11	$115	$241	$82	$449	$0.108	29	29%	15,285,760
8/1/18	8/30/18	4,480	20	$11	$136	$329	$69	$546	$0.104	30	29%	14,466,880
8/31/18	10/2/18	4,240	19	$11	$126	$370	$53	$561	$0.117	33	23%	11,464,320
10/3/18	10/30/18	3,360	12	$11	$110	$293	$37	$451	$0.120	28	46%	12,829,120
10/31/18	11/29/18	3,760	12	$11	$113	$328	$37	$489	$0.117	30	49%	14,739,840
11/30/18	1/2/19	4,320	12	$11	$122	$330	$37	$500	$0.104	34	51%	17,469,440
1/3/19	1/31/19	5,120	18	$11	$131	$391	$52	$585	$0.102	29	36%	15,558,720
2/1/19	3/1/19	4,560	16	$11	$122	$348	$40	$521	$0.103	29	25%	9,553,600
3/2/19	4/1/19	2,800	12	$11	$95	$214	$37	$357	$0.110	31	34%	10,645,440
4/2/19	4/30/19	3,120	12	$11	$106	$238	$37	$393	$0.110	29	35%	10,099,520
5/1/19	5/29/19	2,960	12	$11	$106	$226	$37	$380	$0.112	29	64%	18,561,280
TOTALS		47,280	22	$136	$1,431	$3,693	$589	$5,849	$0.108	363	25%	161,865,280

Transportation Facility												
TOTAL ELECTRIC												
Usage kWh	Demand kW	Electric Customer Charge	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Total Electric Charges	Cost / kW Checksum	Cost / kWh Checksum	Total Cost / kWh Checksum	Days	Load Factor	BTU
3,280	20	$11	$150	$387	$69	$618	$3.41	$0.164	$0.188	32	21%	11,191,360
4,480	22	$11	$115	$241	$82	$449	$3.70	$0.079	$0.100	29	29%	15,285,760
4,240	20	$11	$136	$329	$69	$546	$3.41	$0.110	$0.129	30	29%	14,466,880
3,360	19	$11	$126	$370	$53	$561	$2.88	$0.148	$0.167	33	23%	11,464,320
3,760	12	$11	$110	$293	$37	$451	$3.05	$0.107	$0.120	28	46%	12,829,120
4,320	12	$11	$113	$328	$37	$489	$3.05	$0.102	$0.113	30	49%	14,739,840
5,120	12	$11	$122	$330	$37	$500	$3.05	$0.088	$0.098	34	51%	17,469,440
4,560	18	$11	$131	$391	$52	$585	$2.84	$0.114	$0.128	29	36%	15,558,720
2,800	16	$11	$122	$348	$40	$521	$2.42	$0.168	$0.186	29	25%	9,553,600
3,120	12	$11	$95	$214	$37	$357	$3.05	$0.099	$0.114	31	34%	10,645,440
2,960	12	$11	$106	$238	$37	$393	$3.05	$0.116	$0.133	29	35%	10,099,520
5,440	12	$11	$106	$226	$37	$380	$3.03	$0.061	$0.070	29	64%	18,561,280
47,440	22	$136	$1,431	$3,693	$589	$5,849	$3.11	$0.1080	$0.1233	363	25%	161,865,280



Transportation Facility								Natural Gas Meter #1	
Provider	NJNG		Account #	14-3268-0550-14				Meter #	00810514
Commodity	NJNG		Account #					Meter #	General Service Large
Billing Period Start Date	**Actual Reading**	**Therms**	**Gas Delivery Charges**	**Gas Customer Charge**	**Gas Demand Charge**	**Gas Commodity Charges**	**Gas Total Charges**	**$/Therm Marginal Rate**	**BTU**
6/15/18	7/17/18	35	$15	$50	$175	$0	$241	$0.44	3,507,000
7/18/18	8/15/18	35	$15	$50	$175	$0	$241	$0.44	3,515,000
8/16/18	9/13/18	30	$13	$50	$175	$0	$238	$0.44	2,989,000
9/14/18	10/15/18	22	$10	$51	$158	$0	$219	$0.43	2,238,000
10/16/18	11/13/18	762	$326	$52	$158	$0	$536	$0.43	76,240,000
11/14/18	12/14/18	1,803	$771	$52	$158	$0	$981	$0.43	180,262,000
12/15/18	1/16/19	1,912	$805	$52	$158	$1,128	$2,144	$1.01	191,173,000
1/17/19	2/13/19	2,150	$892	$52	$158	$1,094	$2,196	$0.92	214,997,000
2/14/19	3/18/19	2,061	$855	$63	$190	$954	$2,061	$0.88	206,082,000
3/19/19	4/16/19	1,095	$457	$52	$158	$0	$667	$0.42	109,518,000
4/17/19	5/15/19	593	$249	$52	$158	$0	$459	$0.42	59,341,000
5/16/19	6/17/19	61	$26	$52	$158	$0	$236	$0.42	6,078,000
TOTALS		10,559	$4,434	$629	$1,978	$3,177	$10,218	$0.72	1,055,940,000

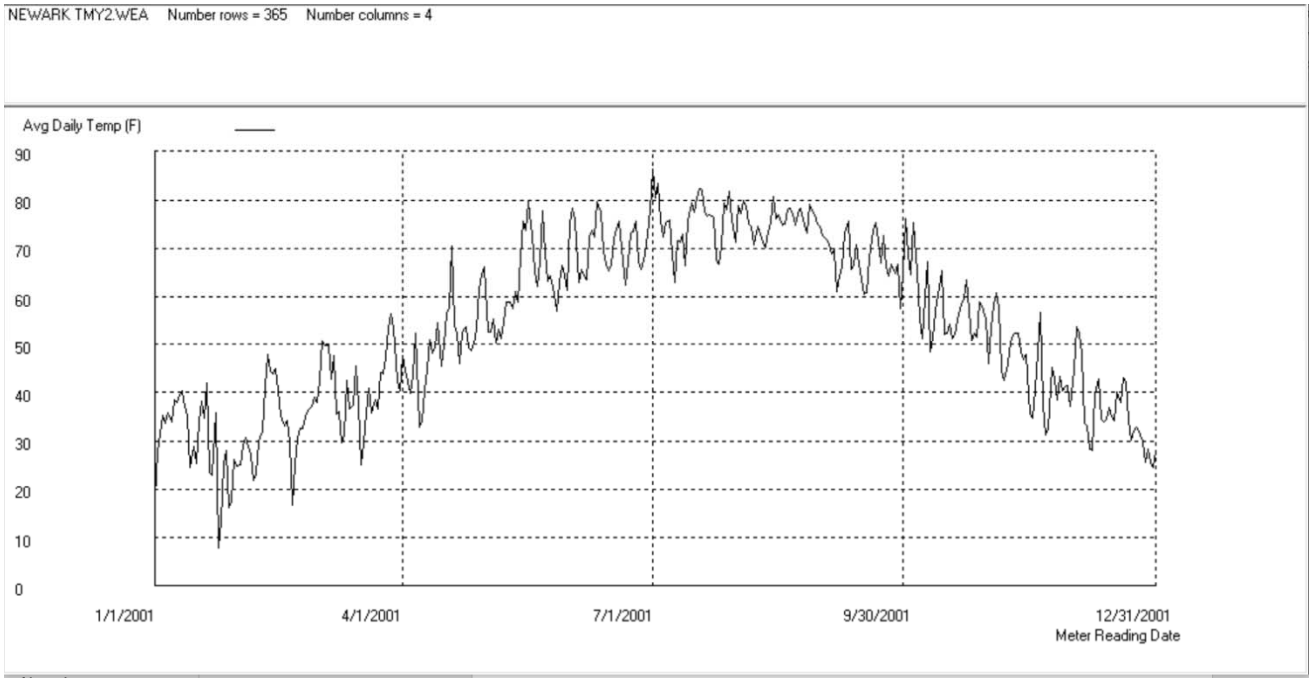
Energy Savings Utility Rates

DCO Energy used the following marginal rates to calculate energy cost savings:

CALCULATED UTILITY RATES - MARGINAL RATES USED FOR SAVINGS					
BUILDING/FACILITY	ELECTRIC				NATURAL GAS
	$ / kW Oct. thru May	$ / kW June thru Sept.	$ / kWh Marginal Rate	$ / kWh Blended Rate	$ / Therm Marginal Rate
Memorial Middle School	$6.09	$6.41	$0.096	$0.116	$0.72
Meadowbrook Elementary	$5.80	$6.14	$0.096	$0.122	$0.75
Margaret L Vetter Elementary	$6.09	$6.32	$0.096	$0.129	$0.73
Woodmere Elementary	$6.12	$5.06	$0.096	$0.121	$0.69
Transportation Facility	$2.92	$3.37	$0.108	$0.123	$0.72

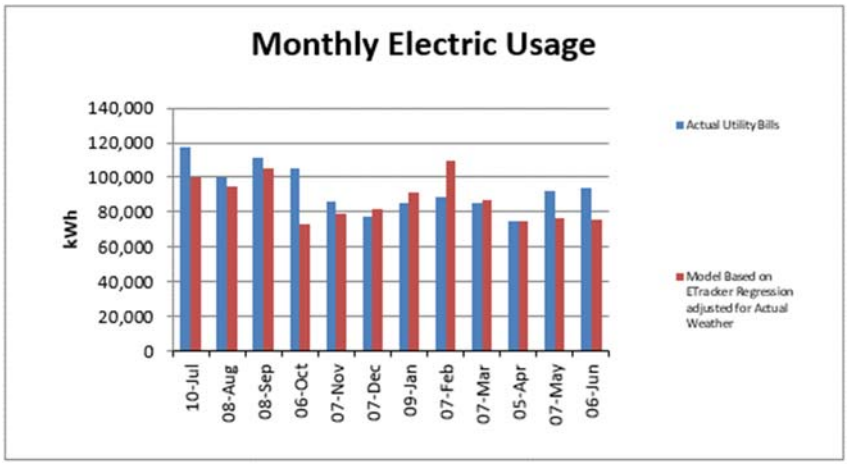
Eatontown Board of Education – Baseline Weather Data

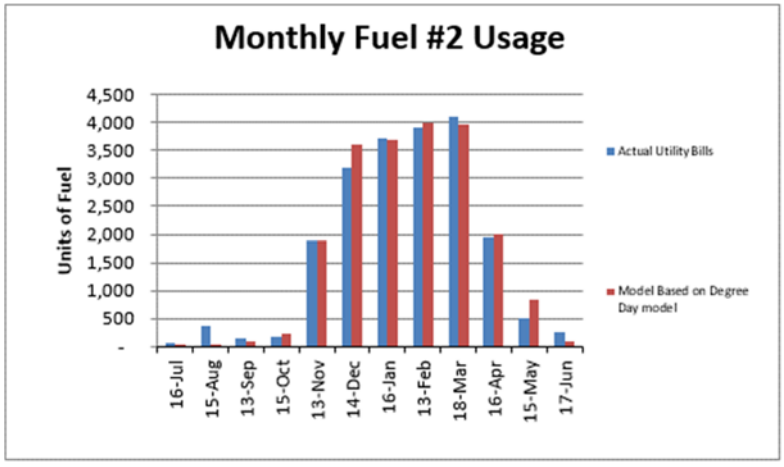
In accordance with the New Jersey Pay for Performance incentive program, TMY2 weather data was used for all weather normalized calculations and energy models utilizing weather data. The graph below represents the Newark TMY2 weather file used for the Eatontown area.



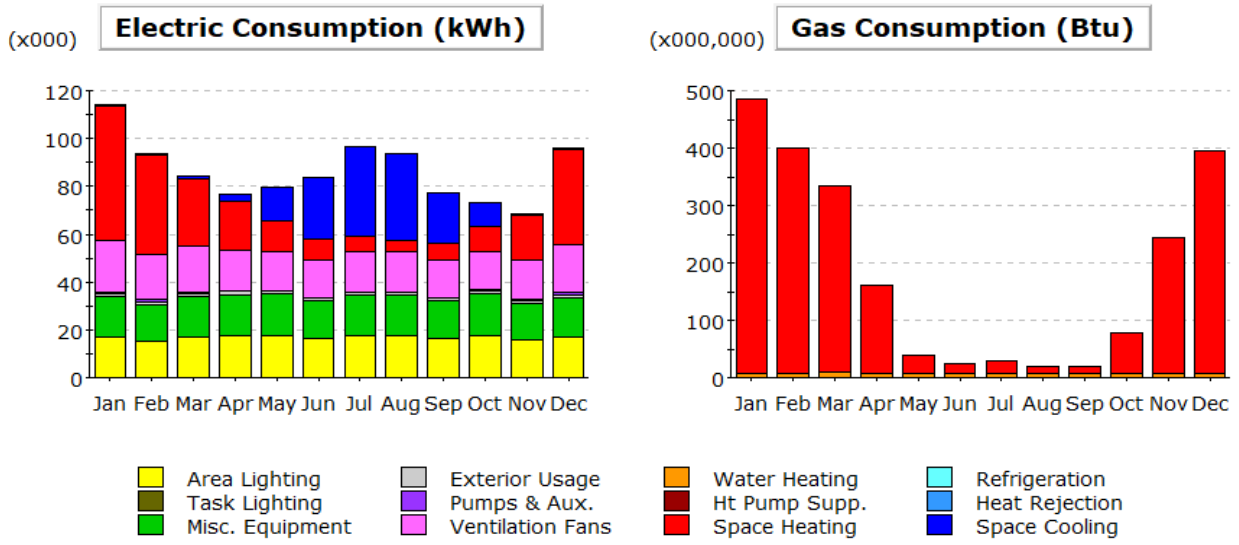
Memorial Middle School– Energy Modeling Baseline

Baseline energy use has been analyzed using eQuest energy simulation software. The New Jersey Pay for Performance incentive program requires +/- 5% accuracy when simulating baseline annual energy use. To calibrate the model, eTracker weather normalization software was used to establish the relationship between weather and energy use of each building. Shown below are the comparison charts and the modeling software baseline output reports. The reports show the model baseline produced by DCO Energy is within acceptable tolerances.





Below is the monthly energy consumption output for the baseline model.



Electric Consumption (kWh x000)

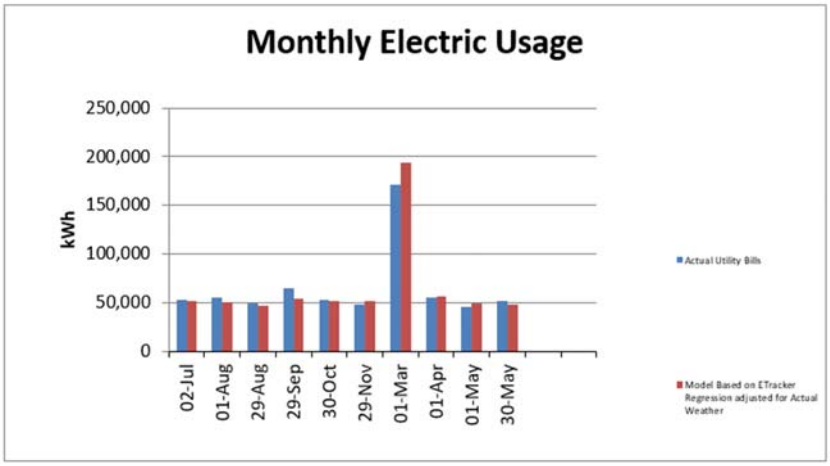
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.5	0.6	1.0	2.9	14.3	25.8	37.5	36.4	21.3	10.3	1.0	0.6	152.0
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	56.6	42.0	28.6	20.8	12.6	9.0	6.2	4.6	6.7	10.2	18.6	39.9	255.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	21.2	18.7	18.9	16.7	16.3	15.8	17.1	17.2	15.9	16.1	16.3	19.7	210.1
Pumps & Aux.	0.9	0.8	0.8	0.5	0.0	-	-	-	0.0	0.3	0.7	0.9	5.0
Ext. Usage	1.3	1.1	1.3	1.2	1.3	1.2	1.3	1.3	1.2	1.3	1.2	1.3	15.0
Misc. Equip.	16.7	15.1	16.7	17.1	17.4	15.7	16.6	16.6	15.9	17.4	15.2	16.5	196.9
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	17.1	15.4	17.1	17.6	17.7	16.3	17.7	17.7	16.3	17.7	15.6	17.1	203.3
Total	114.2	93.7	84.3	76.8	79.6	83.8	96.4	93.8	77.4	73.3	68.7	95.9	1,037.8

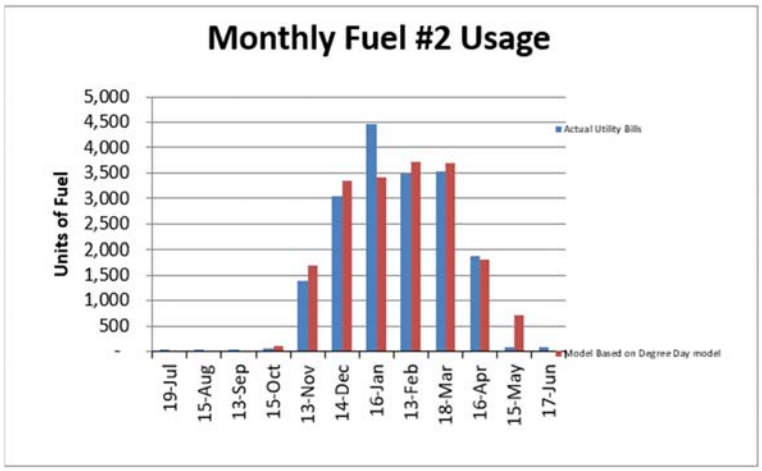
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	477.5	391.9	324.4	154.2	30.8	17.0	21.7	13.4	12.2	70.5	237.9	389.9	2,141.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	7.9	7.4	8.2	6.7	7.8	6.6	6.7	6.4	5.9	6.6	6.3	5.7	82.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	8.2
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	486.0	399.9	333.3	161.6	39.3	24.3	29.1	20.5	18.7	77.9	244.8	396.2	2,231.6

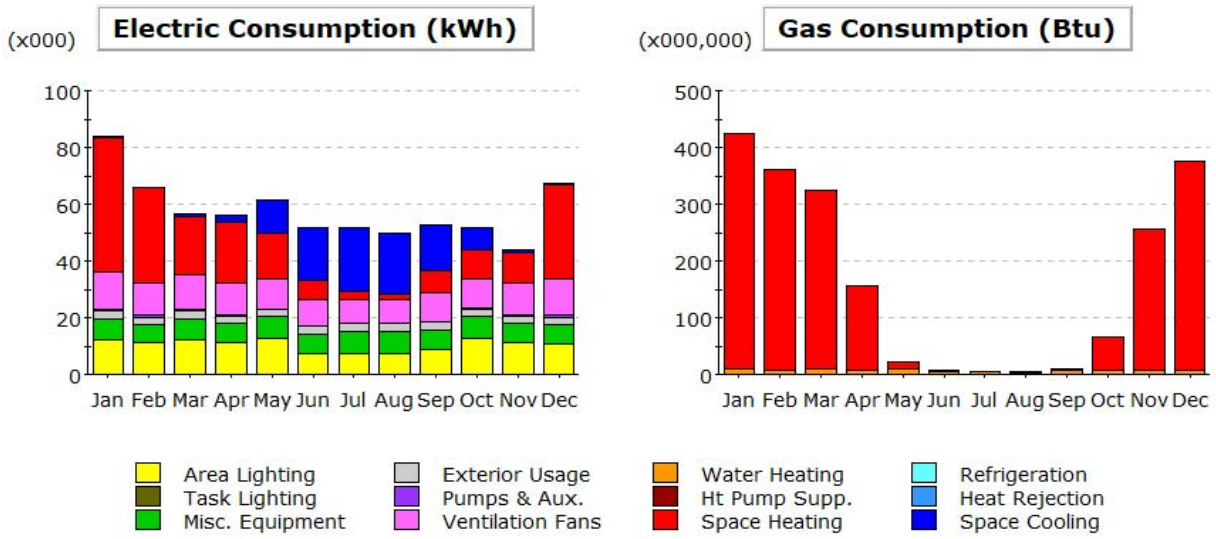
Meadowbrook Elementary – Energy Modeling Baseline

Baseline energy use has been analyzed using eQuest energy simulation software. The New Jersey Pay for Performance incentive program requires +/- 5% accuracy when simulating baseline annual energy use. To calibrate the model, eTracker weather normalization software was used to establish the relationship between weather and energy use of each building. Shown below are the comparison charts and the modeling software baseline output reports. The reports show the model baseline produced by DCO Energy is within acceptable tolerances.





Below is the monthly energy consumption output for the baseline model.



Electric Consumption (kWh x000)

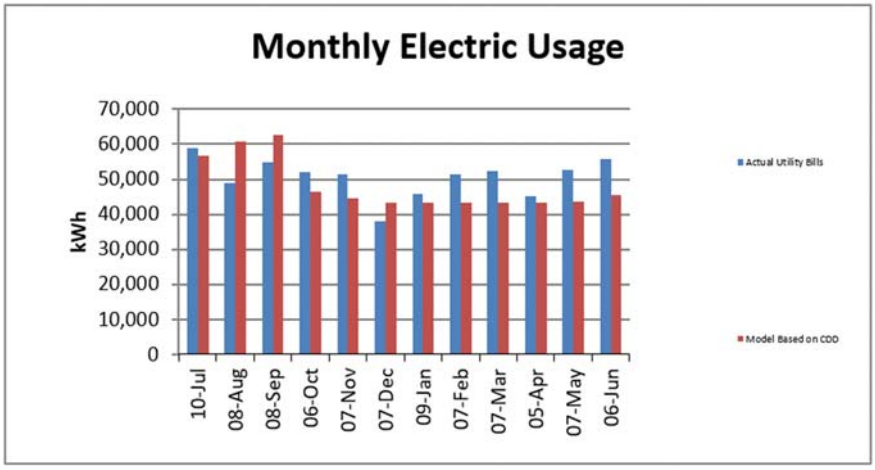
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.45	0.36	0.84	2.39	11.71	18.30	22.40	21.37	16.42	8.17	0.94	0.46	103.82
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	47.39	33.26	20.59	21.49	16.23	7.18	2.73	1.71	7.79	10.20	10.97	33.25	212.79
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	13.04	11.52	12.10	10.95	10.52	9.27	8.59	8.57	10.09	10.22	10.91	12.62	128.40
Pumps & Aux.	0.84	0.75	0.80	0.46	0.01	-	-	-	0.00	0.33	0.76	0.82	4.78
Ext. Usage	2.72	2.46	2.72	2.64	2.72	2.64	2.72	2.72	2.64	2.72	2.64	2.72	32.08
Misc. Equip.	7.34	6.64	7.34	6.89	7.64	7.00	7.64	7.64	7.00	7.64	6.70	6.62	86.08
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	12.15	10.99	12.15	11.18	12.63	7.20	7.54	7.54	8.82	12.63	11.12	10.76	124.72
Total	83.94	65.99	56.54	55.99	61.46	51.60	51.62	49.55	52.77	51.92	44.04	67.26	692.67

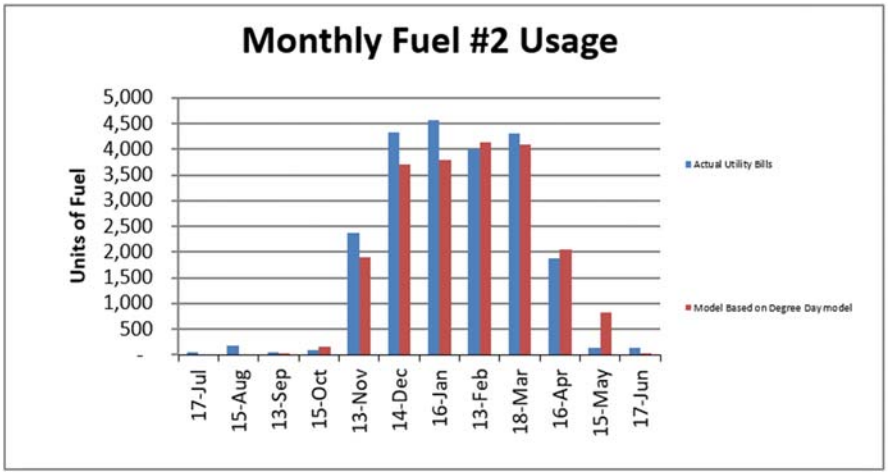
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	415.2	352.7	315.8	147.1	12.2	1.0	0.1	0.1	2.5	58.6	248.4	369.3	1,922.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	8.8	8.3	9.2	8.1	8.7	5.9	3.8	3.6	6.3	7.4	7.0	7.1	84.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	424.0	360.9	324.9	155.2	20.9	6.9	3.9	3.7	8.9	66.0	255.4	376.4	2,007.1

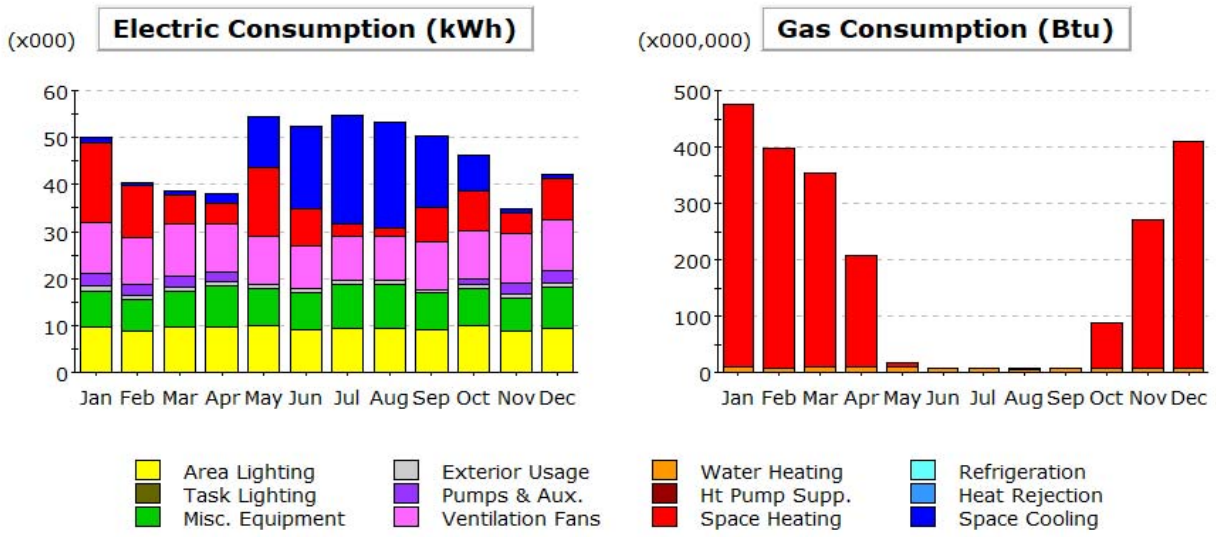
Margaret L Vetter Elementary – Energy Modeling Baseline

Baseline energy use has been analyzed using eQuest energy simulation software. The New Jersey Pay for Performance incentive program requires +/- 5% accuracy when simulating baseline annual energy use. To calibrate the model, eTracker weather normalization software was used to establish the relationship between weather and energy use of each building. Shown below are the comparison charts and the modeling software baseline output reports. The reports show the model baseline produced by DCO Energy is within acceptable tolerances.





Below is the monthly energy consumption output for the baseline model.



Electric Consumption (kWh x000)

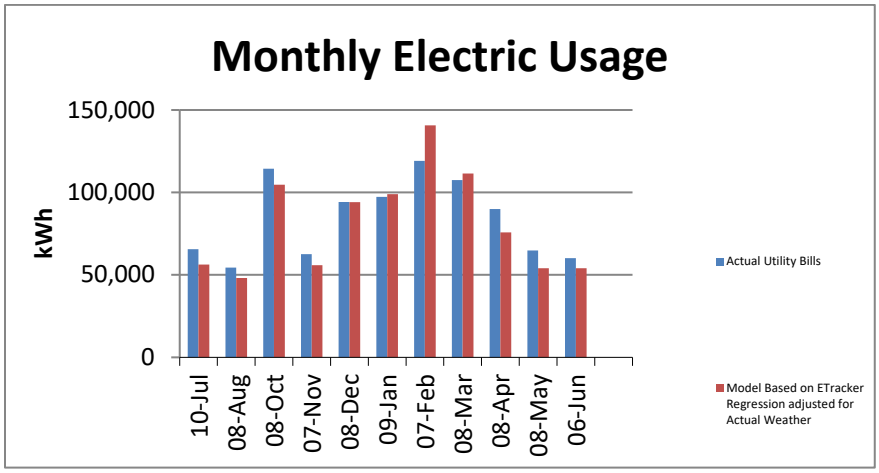
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	1.09	0.75	0.87	2.25	10.68	17.59	23.10	22.40	15.27	7.76	0.92	0.84	103.53
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	17.03	11.10	6.01	4.39	14.67	7.87	2.74	1.67	7.25	8.29	4.25	8.74	94.01
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	11.03	9.97	11.10	10.17	10.35	9.30	9.38	9.56	10.06	10.24	10.62	11.04	122.81
Pumps & Aux.	2.65	2.39	2.54	2.10	0.01	-	-	-	0.00	1.28	2.39	2.61	15.98
Ext. Usage	0.88	0.80	0.88	0.86	0.88	0.86	0.88	0.88	0.86	0.88	0.86	0.88	10.40
Misc. Equip.	7.77	6.78	7.50	8.62	7.80	7.93	9.38	9.38	7.66	7.80	6.85	8.61	96.08
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.65	8.73	9.65	9.75	10.02	8.93	9.24	9.24	9.18	10.02	8.84	9.43	112.67
Total	50.10	40.52	38.54	38.15	54.41	52.48	54.72	53.13	50.27	46.28	34.73	42.16	555.48

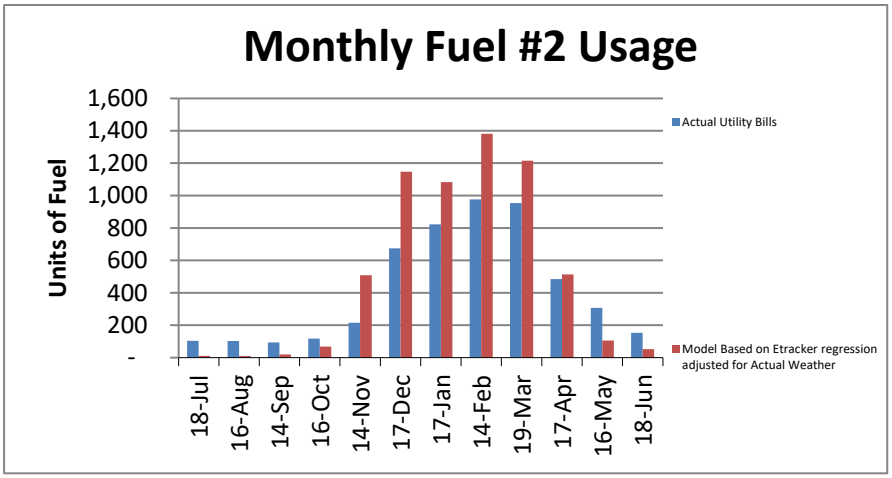
Gas Consumption (Btu x000,000)

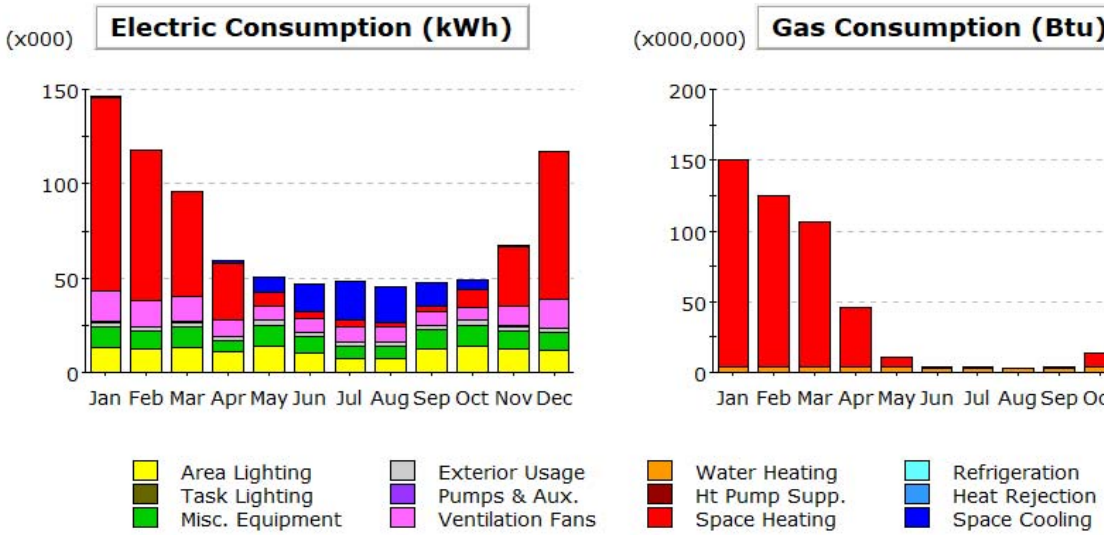
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	467.1	389.5	343.3	199.9	7.3	0.9	1.9	1.1	1.7	80.3	263.9	400.9	2,157.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	8.8	8.3	9.2	8.4	8.4	7.0	6.1	5.8	6.5	7.1	7.3	7.9	90.7
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.5
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	476.1	397.9	352.7	208.5	15.9	8.1	8.2	7.1	8.4	87.7	271.4	408.9	2,251.0

Woodmere Elementary – Energy Modeling Baseline

Baseline energy use has been analyzed using eQuest energy simulation software. The New Jersey Pay for Performance incentive program requires +/- 5% accuracy when simulating baseline annual energy use. To calibrate the model, eTracker weather normalization software was used to establish the relationship between weather and energy use of each building. Shown below are the comparison charts and the modeling software baseline output reports. The reports show the model baseline produced by DCO Energy is within acceptable tolerances.







Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.49	0.43	0.53	1.38	8.51	14.12	20.46	19.33	12.13	5.30	0.49	0.47	83.62
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	102.54	79.18	55.65	30.23	7.24	3.94	3.22	1.89	2.93	9.15	31.81	78.15	405.92
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	16.31	14.13	13.29	8.77	7.32	7.17	8.00	8.03	7.43	6.90	10.27	15.06	122.66
Pumps & Aux.	0.18	0.16	0.16	0.10	0.01	-	-	-	0.00	0.04	0.12	0.17	0.95
Ext. Usage	2.43	2.20	2.43	2.35	2.43	2.35	2.43	2.43	2.35	2.43	2.35	2.43	28.62
Misc. Equip.	10.74	9.72	10.74	5.86	11.18	8.67	6.82	6.82	10.05	11.18	9.81	9.55	111.15
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	13.40	12.12	13.40	10.67	13.93	10.33	7.15	7.15	12.48	13.93	12.26	11.55	138.34
Total	146.09	117.92	96.19	59.35	50.63	46.57	48.07	45.65	47.38	48.92	67.11	117.38	891.26

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	146.24	120.79	101.64	41.63	6.49	1.00	0.84	0.45	1.09	9.76	71.29	123.00	624.23
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	3.88	3.63	4.02	3.77	3.79	2.90	2.41	2.30	2.84	3.28	3.15	3.39	39.35
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	0.35	0.32	0.36	0.35	0.37	0.36	0.37	0.37	0.36	0.37	0.35	0.36	4.30
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	150.47	124.74	106.02	45.76	10.65	4.26	3.62	3.12	4.29	13.41	74.79	126.75	667.88

Transportation Facility – Energy Modeling Baseline

The Transportation Building was not energy modeled because it does not meet the Pay for Performance eligibility requirement of an annual peak demand over 200 kW. Please see Section 3 – Energy Conservation Measures for energy savings calculations.

ENERGY SAVINGS PLAN

SECTION 3 – ENERGY CONSERVATION MEASURES

Energy Conservation Measure Breakdown by Building

The matrix below details which ECMs were applied and evaluated by building. It also indicates which ECMs were included in the project and which ECMs were not included in the project.

EATONTOWN BOARD OF EDUCATION

✔ ECM was evaluated
ECM included in the project

ECM #	ECM DESCRIPTION	Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
1	LED Lighting Replacement	✔	✔	✔	✔	✔
2	Upgrade and Enhance Energy Management System	✔	✔	✔	✔	
3	Bi-Polar Ionization Advanced Filtration	✔	✔	✔	✔	
4	Steam to Hot Water Conversion			✔		
5	Steam Boiler Replacement with additional Condensing Boiler Installation			✔		
6	Condensing Boiler Installation			✔		
7	Burner Replacement			✔		
8	Premium Efficiency Pump Motors and VFDs			✔		
9	Rooftop Unit Replacement	✔	✔	✔	✔	
10	Ductwork Renovations	✔	✔	✔	✔	
11	Destratification Fans	✔	✔	✔	✔	
12	Domestic Hot Water Heater Replacement	✔				
13	Solar PPA	✔	✔	✔	✔	✔
14	Combined Heat & Power Unit	✔				
15	Roof Refurbishment	✔	✔	✔	✔	✔

ECM Breakdown by Cost & Savings

EATONTOWN BOARD OF EDUCATION		INCLUDED IN PROJECT	INSTALLED COST	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS	ANNUAL ENERGY COST SAVINGS	ANNUAL O&M COST SAVINGS	TOTAL ANNUAL COST SAVINGS	SIMPLE PAYBACK WITHOUT INCENTIVES
ECM #	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$	$	$	$	$	YEARS
1	LED Lighting Replacement	Y	$565,502	$47,249	($1,094)	$46,155	$1,190	$47,345	11.9
2	Upgrade and Enhance Energy Management System	Y	$647,082	$61,237	$11,233	$72,470	$0	$72,470	8.9
3	Bi-Polar Ionization Advanced Filtration	N	$0	$0	$0	$0	$0	$0	0.0
4	Steam to Hot Water Conversion	N	$0	$0	$0	$0	$0	$0	0.0
5	Steam Boiler Replacement with additional Condensing Boiler Installation	N	$0	$0	$0	$0	$0	$0	0.0
6	Condensing Boiler Installation	N	$0	$0	$0	$0	$0	$0	0.0
7	Burner Replacement	N	$0	$0	$0	$0	$0	$0	0.0
8	Premium Efficiency Pump Motors and VFDs	Y	$30,000	$2,342	($445)	$1,897	$0	$1,897	15.8
9	Rooftop Unit Replacement	Y	$1,883,540	$11,894	$2	$11,896	$0	$11,896	158.3
10	Ductwork Renovations	Y	$35,000	$0	$0	$0	$0	$0	0.0
11	Destratification Fans	Y	$52,000	$669	$2,570	$3,239	$0	$3,239	16.1
12	Domestic Hot Water Heater Replacement	N	$0	$0	$0	$0	$0	$0	0.0
13	Solar PPA	Y	$0	$116,976	$0	$116,976	$0	$116,976	0.0
14	Combined Heat & Power Unit	Y	$275,000	$9,376	($2,739)	$6,637	$0	$6,637	41.4
15	Roof Refurbishment	N	$0	$0	$0	$0	$0	$0	0.0
TOTALS			$3,488,124	$249,743	$9,527	$259,270	$1,190	$260,460	13.4

EATONTOWN BOARD OF EDUCATION		INCLUDED IN PROJECT	ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	NATURAL GAS SAVINGS	TOTAL SITE ENERGY SAVINGS	TOTAL SOURCE ENERGY SAVINGS
ECM #	ENERGY CONSERVATION MEASURE	"Y" OR "N"	kWh	kW	THERMS	MMBTU	MMBTU
1	LED Lighting Replacement	Y	457,716	43	(1,504)	1,411	4,215
2	Upgrade and Enhance Energy Management System	Y	555,004	109	15,448	3,438	6,924
3	Bi-Polar Ionization Advanced Filtration	N	0	0	0	0	0
4	Steam to Hot Water Conversion	N	0	0	0	0	0
5	Steam Boiler Replacement with additional Condensing Boiler Installation	N	0	0	0	0	0
6	Condensing Boiler Installation	N	0	0	0	0	0
7	Burner Replacement	N	0	0	0	0	0
8	Premium Efficiency Pump Motors and VFDs	Y	20,844	5	(613)	10	135
9	Rooftop Unit Replacement	Y	123,317	1	3	421	1,178
10	Ductwork Renovations	Y	0	0	0	0	0
11	Destratification Fans	Y	6,954	0	3,551	379	439
12	Domestic Hot Water Heater Replacement	N	0	0	0	0	0
13	Solar PPA	Y	0	0	0	0	9,286
14	Combined Heat & Power Unit	Y	70,365	35	(3,780)	-138	275
15	Roof Refurbishment	N	0	0	0	0	0
TOTALS			1,234,200	192	13,105	5,522	22,453

DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648

ECM Breakdown by Greenhouse Gas Reduction

EATONTOWN BOARD OF EDUCATION		INCLUDED IN PROJECT	Reduction of CO_2	Reduction of Nox	Reduction of SO_2	Reduction of Hg
ECM #	ENERGY CONSERVATION MEASURE	"Y" OR "N"	LBS	LBS	LBS	LBS
1	LED Lighting Replacement	Y	485,891	421	1,012	2,129
2	Upgrade and Enhance Energy Management System	Y	791,240	669	1,227	2,582
3	Bi-Polar Ionization Advanced Filtration	N	0	0	0	0.0
4	Steam to Hot Water Conversion	N	0	0	0	0.0
5	Steam Boiler Replacement with additional Condensing Boiler Installation	N	0	0	0	0
6	Condensing Boiler Installation	N	0	0	0	0.0
7	Burner Replacement	N	0	0	0	0
8	Premium Efficiency Pump Motors and VFDs	Y	15,757	14	46	97
9	Rooftop Unit Replacement	Y	345,290	117	273	573.6
10	Ductwork Renovations	Y	0	0	0	0.0
11	Destratification Fans	Y	49,197	39	15	32
12	Domestic Hot Water Heater Replacement	N	0	0	0	0.0
13	Solar PPA	Y	1,663,186	1,436	3,341	7,033
14	Combined Heat & Power Unit	Y	33,181	32	156	327
15	Roof Refurbishment	N	0	0	0	0
TOTALS			3,383,742	2,729	6,069	12,775

Note: Factors used to calculate Greenhouse Gas Reductions are as follows:

	UTILITIES				
	ELECTRIC	NATURAL GAS	OTHER ENERGY #1	OTHER ENERGY #2	OTHER ENERGY #3
UNITS	kW & kWh	Therms	NONE	NONE	NONE
BTU MULTIPLIER	3,412	100,000	0	0	0
CO2 EMISSION FACTOR (LB CO2/UNIT FUEL)	1.10	11.70	0.00	0.00	0.00
SITE-SOURCE MULTIPLIER	2.80	1.05	0.00	0.00	0.00

Note:

- **Factors used to calculate Greenhouse Gas Reductions are as follows:**
  - ***CO2 = (1.52*kWh Savings) + (11.7*Therm Savings)***
  - ***NOx = (0.0028*kWh Savings) + (0.0092*Therm Savings)***
  - ***SO2 = (0.0065*kWh Savings)***
  - ***Hg = (0.0000000356* kWh Savings)***

ECM Breakdown by Building by Cost & Savings

EATONTOWN BOARD OF EDUCATION % SAVINGS BY BUILDING (T.O.R.)						
EATONTOWN BOARD OF EDUCATION BUILDINGS/FACILITIES		UTILITY ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	ONSITE ELECTRIC SAVINGS	NATURAL GAS SAVINGS	ONSITE NATURAL GAS SAVINGS
BUILDING/FACILITY NAME	SQFT	kWh	kW	kWh	THERMS	THERMS
Memorial Middle School	58,225	42.5%	19.6%	36.2%	10.2%	28.8%
Meadowbrook Elementary	42,605	41.2%	8.0%	41.2%	21.7%	21.7%
Margaret L Vetter Elementary	33,635	43.0%	21.8%	43.0%	22.6%	22.6%
Woodmere Elementary	44,510	23.0%	8.0%	23.0%	43.9%	43.9%
Transportation Facility	10,800	35.6%	14.5%	35.6%	-0.8%	-0.8%
TOTALS	**189,775**	**36.8%**	**13.9%**	**34.7%**	**17.2%**	**22.2%**

EATONTOWN BOARD OF EDUCATION SAVINGS BY BUILDING BY UTILITY FROM SMART SELECT						
EATONTOWN BOARD OF EDUCATION BUILDINGS/FACILITIES		ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	ONSITE ELECTRIC SAVINGS	NATURAL GAS SAVINGS	ONSITE NATURAL GAS SAVINGS
BUILDING/FACILITY NAME	SQFT	kWh	kW	kWh	THERMS	THERMS
Memorial Middle School	58,225	475,455	64	405,090	2,077	5,856
Meadowbrook Elementary	42,605	266,428	24	266,428	3,931	3,931
Margaret L Vetter Elementary	33,635	261,533	67	261,533	4,985	4,985
Woodmere Elementary	44,510	213,876	35	213,876	2,198	2,198
Transportation Facility	10,800	16,908	3	16,908	(86)	(86)
TOTALS	**189,775**	**1,234,200**	**192**	**1,163,835**	**13,105**	**16,884**

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	INSTALLED COST	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS	ANNUAL ENERGY COST SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$	$	$
1	Memorial Middle School	LED Lighting Replacement	Y	$162,805	$15,668	($417)	$15,251
2	Memorial Middle School	Upgrade and Enhance Energy Management System	Y	$206,353	$21,035	$4,057	$25,093
3	Memorial Middle School	Bi-Polar Ionization Advanced Filtration	N	$0	$0	$0	$0
9	Memorial Middle School	Rooftop Unit Replacement	Y	$664,240	$4,209	($46)	$4,163
10	Memorial Middle School	Ductwork Renovations	Y	$15,200	$0	$0	$0
11	Memorial Middle School	Destratification Fans	Y	$13,000	$217	$649	$866
12	Memorial Middle School	Domestic Hot Water Heater Replacement	N	$0	$0	$0	$0
13	Memorial Middle School	Solar PPA	Y	$0	$44,000	$0	$44,000
14	Memorial Middle School	Combined Heat & Power Unit	Y	$275,000	$9,376	($2,739)	$6,637
15	Memorial Middle School	Roof Refurbishment	N	$0	$0	$0	$0
	Memorial Middle School	TOTALS		$1,336,598	$94,505	$1,505	$96,010

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	NATURAL GAS SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	kWh	kW	THERMS
1	Memorial Middle School	LED Lighting Replacement	Y	145,882	21.8	-576
2	Memorial Middle School	Upgrade and Enhance Energy Management System	Y	213,236	6.8	5,599
3	Memorial Middle School	Bi-Polar Ionization Advanced Filtration	N	0	0.0	0
9	Memorial Middle School	Rooftop Unit Replacement	Y	43,719	0.0	-64
10	Memorial Middle School	Ductwork Renovations	Y	0	0.0	0
11	Memorial Middle School	Destratification Fans	Y	2,252	0.0	896
12	Memorial Middle School	Domestic Hot Water Heater Replacement	N	0	0.0	0
13	Memorial Middle School	Solar PPA	Y	0	0.0	0
14	Memorial Middle School	Combined Heat & Power Unit	Y	70,365	35.0	-3,780
15	Memorial Middle School	Roof Refurbishment	N	0	0.0	0
	Memorial Middle School	TOTALS		475,455	63.7	2,077

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	INSTALLED COST	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS	ANNUAL ENERGY COST SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$	$	$
1	Meadowbrook Elementary	LED Lighting Replacement	Y	$132,772	$9,658	($222)	$9,436
2	Meadowbrook Elementary	Upgrade and Enhance Energy Management System	Y	$129,518	$14,264	$2,447	$16,711
3	Meadowbrook Elementary	Bi-Polar Ionization Advanced Filtration	N	$0	$0	$0	$0
9	Meadowbrook Elementary	Rooftop Unit Replacement	Y	$452,600	$3,223	$0	$3,223
10	Meadowbrook Elementary	Ductwork Renovations	Y	$6,100	$0	$0	$0
11	Meadowbrook Elementary	Destratification Fans	Y	$13,000	$87	$737	$824
13	Meadowbrook Elementary	Solar PPA	Y	$0	$17,096	$0	$17,096
15	Meadowbrook Elementary	Roof Refurbishment	N	$0	$0	$0	$0
	Meadowbrook Elementary	TOTALS		$733,990	$44,329	$2,962	$47,291

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	NATURAL GAS SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	kWh	kW	THERMS
1	Meadowbrook Elementary	LED Lighting Replacement	Y	96,776	5.3	-295
2	Meadowbrook Elementary	Upgrade and Enhance Energy Management System	Y	135,210	18.2	3,247
3	Meadowbrook Elementary	Bi-Polar Ionization Advanced Filtration	N	0	0.0	0
9	Meadowbrook Elementary	Rooftop Unit Replacement	Y	33,537	0.1	1
10	Meadowbrook Elementary	Ductwork Renovations	Y	0	0.0	0
11	Meadowbrook Elementary	Destratification Fans	Y	905	0.0	978
13	Meadowbrook Elementary	Solar PPA	Y	0	0.0	0
15	Meadowbrook Elementary	Roof Refurbishment	N	0	0.0	0
	Meadowbrook Elementary	TOTALS		266,428	23.6	3,931

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	INSTALLED COST	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS	ANNUAL ENERGY COST SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$	$	$
1	Margaret L Vetter Elementary	LED Lighting Replacement	Y	$105,923	$8,768	($316)	$8,452
2	Margaret L Vetter Elementary	Upgrade and Enhance Energy Management System	Y	$158,635	$16,992	$3,700	$20,692
3	Margaret L Vetter Elementary	Bi-Polar Ionization Advanced Filtration	N	$0	$0	$0	$0
4	Margaret L Vetter Elementary	Steam to Hot Water Conversion	N	$0	$0	$0	$0
5	Margaret L Vetter Elementary	Steam Boiler Replacement with additional Condensing Boiler Installation	N	$0	$0	$0	$0
6	Margaret L Vetter Elementary	Condensing Boiler Installation	N	$0	$0	$0	$0
7	Margaret L Vetter Elementary	Burner Replacement	N	$0	$0	$0	$0
8	Margaret L Vetter Elementary	Premium Efficiency Pump Motors and VFDs	Y	$30,000	$2,342	($445)	$1,897
9	Margaret L Vetter Elementary	Rooftop Unit Replacement	Y	$297,600	$1,931	$48	$1,979
10	Margaret L Vetter Elementary	Ductwork Renovations	Y	$6,600	$0	$0	$0
11	Margaret L Vetter Elementary	Destratification Fans	Y	$13,000	$86	$629	$715
13	Margaret L Vetter Elementary	Solar PPA	Y	$0	$18,095	$0	$18,095
15	Margaret L Vetter Elementary	Roof Refurbishment	N	$0	$0	$0	$0
	Margaret L Vetter Elementary	TOTALS		$611,758	$48,214	$3,617	$51,830

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	NATURAL GAS SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	kWh	kW	THERMS
1	Margaret L Vetter Elementary	LED Lighting Replacement	Y	89,753	1.8	-436
2	Margaret L Vetter Elementary	Upgrade and Enhance Energy Management System	Y	130,211	60.3	5,100
3	Margaret L Vetter Elementary	Bi-Polar Ionization Advanced Filtration	N	0	0.0	0
4	Margaret L Vetter Elementary	Steam to Hot Water Conversion	N	0	0.0	0
5	Margaret L Vetter Elementary	Steam Boiler Replacement with additional Condensing Boiler Installation	N	0	0.0	0
6	Margaret L Vetter Elementary	Condensing Boiler Installation	N	0	0.0	0
7	Margaret L Vetter Elementary	Burner Replacement	N	0	0.0	0
8	Margaret L Vetter Elementary	Premium Efficiency Pump Motors and VFDs	Y	20,844	4.5	-613
9	Margaret L Vetter Elementary	Rooftop Unit Replacement	Y	19,833	0.3	66
10	Margaret L Vetter Elementary	Ductwork Renovations	Y	0	0.0	0
11	Margaret L Vetter Elementary	Destratification Fans	Y	892	0.0	868
13	Margaret L Vetter Elementary	Solar PPA	Y	0	0.0	0
15	Margaret L Vetter Elementary	Roof Refurbishment	N	0	0.0	0
	Margaret L Vetter Elementary	TOTALS		261,533	66.9	4,985

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	INSTALLED COST	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS	ANNUAL ENERGY COST SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$	$	$
1	Woodmere Elementary	LED Lighting Replacement	Y	$145,376	$11,210	($77)	$11,133
2	Woodmere Elementary	Upgrade and Enhance Energy Management System	Y	$152,576	$8,946	$1,028	$9,974
3	Woodmere Elementary	Bi-Polar Ionization Advanced Filtration	N	$0	$0	$0	$0
9	Woodmere Elementary	Rooftop Unit Replacement	Y	$469,100	$2,532	$0	$2,532
10	Woodmere Elementary	Ductwork Renovations	Y	$7,100	$0	$0	$0
11	Woodmere Elementary	Destratification Fans	Y	$13,000	$279	$554	$834
13	Woodmere Elementary	Solar PPA	Y	$0	$35,630	$0	$35,630
15	Woodmere Elementary	Roof Refurbishment	N	$0	$0	$0	$0
	Woodmere Elementary	TOTALS		$787,152	$58,597	$1,506	$60,103

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	NATURAL GAS SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	kWh	kW	THERMS
1	Woodmere Elementary	LED Lighting Replacement	Y	108,397	11.4	-112
2	Woodmere Elementary	Upgrade and Enhance Energy Management System	Y	76,347	23.2	1,501
3	Woodmere Elementary	Bi-Polar Ionization Advanced Filtration	N	0	0.0	0
9	Woodmere Elementary	Rooftop Unit Replacement	Y	26,228	0.1	0
10	Woodmere Elementary	Ductwork Renovations	Y	0	0.0	0
11	Woodmere Elementary	Destratification Fans	Y	2,904	0.0	809
13	Woodmere Elementary	Solar PPA	Y	0	0.0	0
15	Woodmere Elementary	Roof Refurbishment	N	0	0.0	0
	Woodmere Elementary	TOTALS		213,876	34.7	2,198

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	INSTALLED COST	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS	ANNUAL ENERGY COST SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$	$	$
1	Transportation Facility	LED Lighting Replacement	Y	$18,626	$1,945	($62)	$1,883
13	Transportation Facility	Solar PPA	Y	$0	$2,154	$0	$2,154
15	Transportation Facility	Roof Refurbishment	N	$0	$0	$0	$0
	Transportation Facility	TOTALS		$18,626	$4,099	($62)	$4,037

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	NATURAL GAS SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	kWh	kW	THERMS
1	Transportation Facility	LED Lighting Replacement	Y	16,908	3.2	-86
13	Transportation Facility	Solar PPA	Y	0	0.0	0
15	Transportation Facility	Roof Refurbishment	N	0	0.0	0
	Transportation Facility	TOTALS		16,908	3.2	-86

ECM Breakdown by Building by Greenhouse Gas Reductions

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	Reduction of CO_2	Reduction of Nox	Reduction of SO_2	Reduction of Hg
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	LBS	LBS	LBS	LBS
1	Memorial Middle School	LED Lighting Replacement	Y	153,735	133	322	679
2	Memorial Middle School	Upgrade and Enhance Energy Management System	Y	300,072	254	471	992
3	Memorial Middle School	Bi-Polar Ionization Advanced Filtration	N	0	0	0	0
9	Memorial Middle School	Rooftop Unit Replacement	Y	122,347	41	97	203
10	Memorial Middle School	Ductwork Renovations	Y	0	0	0	0
11	Memorial Middle School	Destratification Fans	Y	12,964	10	5	10
12	Memorial Middle School	Domestic Hot Water Heater Replacement	N	0	0	0	0
13	Memorial Middle School	Solar PPA	Y	626,365	541	1,258	2,649
14	Memorial Middle School	Combined Heat & Power Unit	Y	33,181	32	156	327
15	Memorial Middle School	Roof Refurbishment	N	0	0	0	0
	Memorial Middle School	TOTALS		1,248,664	1,012	2,309	4,861

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	Reduction of CO_2	Reduction of Nox	Reduction of SO_2	Reduction of Hg
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	LBS	LBS	LBS	LBS
1	Meadowbrook Elementary	LED Lighting Replacement	Y	103,007	89	214	450
2	Meadowbrook Elementary	Upgrade and Enhance Energy Management System	Y	186,719	158	299	629
3	Meadowbrook Elementary	Bi-Polar Ionization Advanced Filtration	N	0	0	0	0
9	Meadowbrook Elementary	Rooftop Unit Replacement	Y	93,905	32	74	156
10	Meadowbrook Elementary	Ductwork Renovations	Y	0	0	0	0
11	Meadowbrook Elementary	Destratification Fans	Y	12,439	10	2	4
13	Meadowbrook Elementary	Solar PPA	Y	244,494	211	491	1,034
15	Meadowbrook Elementary	Roof Refurbishment	N	0	0	0	0
	Meadowbrook Elementary	TOTALS		673,746	533	1,236	2,601

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	Reduction of CO_2	Reduction of Nox	Reduction of SO_2	Reduction of Hg
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	LBS	LBS	LBS	LBS
1	Margaret L Vetter Elementary	LED Lighting Replacement	Y	93,629	81	198	418
2	Margaret L Vetter Elementary	Upgrade and Enhance Energy Management System	Y	202,906	171	288	606
3	Margaret L Vetter Elementary	Bi-Polar Ionization Advanced Filtration	N	0	0	0	0
4	Margaret L Vetter Elementary	Steam to Hot Water Conversion	N	0	0	0	0
5	Margaret L Vetter Elementary	Steam Boiler Replacement with additional Condensing Boiler Installation	N	0	0	0	0
6	Margaret L Vetter Elementary	Condensing Boiler Installation	N	0	0	0	0
7	Margaret L Vetter Elementary	Burner Replacement	N	0	0	0	0
8	Margaret L Vetter Elementary	Premium Efficiency Pump Motors and VFDs	Y	15,757	14	46	97
9	Margaret L Vetter Elementary	Rooftop Unit Replacement	Y	55,600	19	44	92
10	Margaret L Vetter Elementary	Ductwork Renovations	Y	0	0	0	0
11	Margaret L Vetter Elementary	Destratification Fans	Y	11,133	9	2	4
13	Margaret L Vetter Elementary	Solar PPA	Y	257,760	223	518	1,090
15	Margaret L Vetter Elementary	Roof Refurbishment	N	0	0	0	0
	Margaret L Vetter Elementary	TOTALS		636,786	517	1,096	2,307

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	Reduction of CO_2	Reduction of Nox	Reduction of SO_2	Reduction of Hg
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	LBS	LBS	LBS	LBS
1	Woodmere Elementary	LED Lighting Replacement	Y	117,922	102	240	504
2	Woodmere Elementary	Upgrade and Enhance Energy Management System	Y	101,543	86	169	355
3	Woodmere Elementary	Bi-Polar Ionization Advanced Filtration	N	0	0	0	0
9	Woodmere Elementary	Rooftop Unit Replacement	Y	73,438	25	58	122
10	Woodmere Elementary	Ductwork Renovations	Y	0	0	0	0
11	Woodmere Elementary	Destratification Fans	Y	12,661	10	6	14
13	Woodmere Elementary	Solar PPA	Y	507,952	439	1,021	2,148
15	Woodmere Elementary	Roof Refurbishment	N	0	0	0	0
	Woodmere Elementary	TOTALS		813,516	662	1,493	3,143

EATONTOWN BOARD OF EDUCATION			INCLUDED IN PROJECT	Reduction of CO_2	Reduction of Nox	Reduction of SO_2	Reduction of Hg
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	LBS	LBS	LBS	LBS
1	Transportation Facility	LED Lighting Replacement	Y	17,597	15	37	79
13	Transportation Facility	Solar PPA	Y	26,615	23	53	113
15	Transportation Facility	Roof Refurbishment	N	0	0	0	0
	Transportation Facility	TOTALS		44,212	38	91	191

Note:

- **Factors used to calculate Greenhouse Gas Reductions are as follows:**
  - ***CO2 = (1.52*kWh Savings) + (11.7*Therm Savings)***
  - ***NOx = (0.0028*kWh Savings) + (0.0092*Therm Savings)***
  - ***SO2 = (0.0065*kWh Savings)***
  - ***Hg = (0.0000000356* kWh Savings)***

ECM Budgeting Narrative

The budgetary costs carried in the project are based on good faith estimates, contractor supplied budgets for similar ECMs on other recent projects and a database of actual installed costs for various ECMs.

EATONTOWN BOARD OF EDUCATION		INCLUDED IN PROJECT	INSTALLED COST
ECM #	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$
1	LED Lighting Replacement	Y	$565,502
2	Upgrade and Enhance Energy Management System	Y	$647,082
3	Bi-Polar Ionization Advanced Filtration	N	$0
4	Steam to Hot Water Conversion	N	$0
5	Steam Boiler Replacement with additional Condensing Boiler Installation	N	$0
6	Condensing Boiler Installation	N	$0
7	Burner Replacement	N	$0
8	Premium Efficiency Pump Motors and VFDs	Y	$30,000
9	Rooftop Unit Replacement	Y	$1,883,540
10	Ductwork Renovations	Y	$35,000
11	Destratification Fans	Y	$52,000
12	Domestic Water Heater Replacement	N	$0
13	Solar PPA	Y	$0
14	Combined Heat & Power Unit	Y	$275,000
15	Roof Refurbishment	N	$0
	TOTALS		$3,488,124

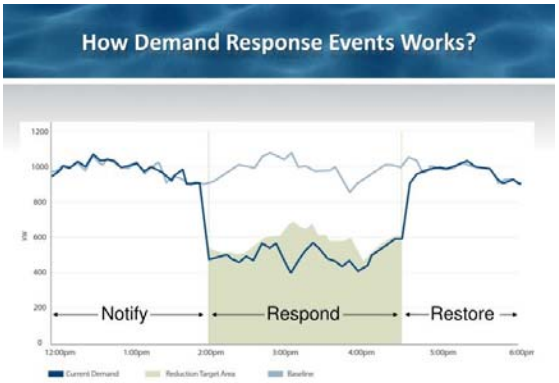
Demand Response & Project Incentives Analysis

Demand Response

Demand Response (DR) is a voluntary Pennsylvania-Jersey-Maryland (PJM) Interconnection program that allows end use customers to reduce their electricity usage during periods of higher power prices. In exchange, end-use customers are compensated through PJM members known as Curtailment Service Providers (CSPs) for decreasing their electricity use when requested by PJM.

Common reduction strategies used in Demand Response include:

- Manual or automatic load drop
- Energy management systems
- Load shedding strategies
- Lighting control strategies
- Backup generation
- Ice storage systems



Benefits of the program include:

- Significant source of new revenue
- Helps to ensure local grid reliability
- Reduces the need for new environmentally taxing energy generation

In the base product, customers commit to reducing their load at the direction of PJM during emergency conditions during the summer months. In the Capacity Performance product, the customer will need to be able to reduce load when directed during the entire year.

SmartStart

The SmartStart Buildings Program offers incentives to upgrade many different technologies in your building. Equipment incentives are calculated based on type, efficiency, size, and application and are evaluated on a case-by-case basis. Starting October 1, 2020, enhanced incentives are now available for certain facilities. SmartStart incentives will be applied for at the Transportation Facility.

SmartStart Buildings Program

Prescriptive Lighting Application

FY21 October 1, 2020 – June 30, 2021

New Jersey's cleanenergy program™ njcleanenergy.com

MEASURE DESCRIPTION

Prescriptive Lighting incentives are available for simple, one for one replacements of existing fixtures with most common interior and exterior LED bulbs, retrofit kits and fixtures in commercial and industrial facilities. Incentive rates are pre-determined based on the LED category type as listed by DesignLights Consortium or ENERGY STAR®. Ground up new construction and major renovations of existing buildings are not eligible for Prescriptive Lighting incentives and should pursue incentives using the Performance Lighting application. For fixtures that are ENERGY STAR® or DLC listed under a category not appearing on this application may be provided incentives through the SmartStart Custom application. Please contact us to discuss the Custom application as additional requirements apply.

	Design Lights Consortium® Qualified Products	Measure Code	Incentive Rate
LED TUBES	2' Linear Replacement Lamps (UL Type A, Type B, Type C)	PL1	$3/tube
	3' Linear Replacement Lamps (UL Type A, Type B, Type C)	PL2	$5/tube
	4' Linear Replacement Lamps (UL Type A, Type B, Type C)	PL3	$5/tube
	8' Linear Replacement Lamps (UL Type A, Type B, Type C)	PL4	$10/tube
	U-Bend Linear Replacement Lamps (UL Type A, Type B, Type C)	PL5	$5/tube

	Design Lights Consortium® Qualified Products	Measure Code	Incentive Rate
EXTERIOR LIGHTING	Architectural Flood and Spot Luminaires	PL27	$50/fixture
	Bollards	PL28	$50/fixture
	Fuel Pump Canopy Luminaires (*Includes new and Retrofit Kits)*	PL29	$100/fixture
	Landscape/Accent Flood and Spot	PL30	$25/fixture
	Outdoor Wall-Mounted Area Luminaires (*Includes Full-Cutoff, Non-Cutoff and Semi-cutoff*)	PL31	$50/fixture
	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires *(Includes new and Retrofit Kits)*	PL32	$100/fixture
	Outdoor Pole/Arm-Mounted Decorative Luminaires *(Includes new and Retrofit Kits)*	PL33	$50/fixture
	Parking Garage Luminaires (Includes new and Retrofit Kits)	PL34	$100/fixture
	Large Outdoor Pole/Arm-Mounted Area and Roadway Retrofit	PL35	$150/fixture

Combined Heat & Power

One of the goals of the State of New Jersey is to enhance energy efficiency through on-site power generation with recovery and productive use of waste heat, and to reduce existing and new demands to the electric power grid. The Board of Public Utilities seeks to accomplish this goal by providing generous financial incentives for Combined Heat & Power (CHP) and Fuel Cell (FC) installations.

Eligible CHP or Waste Heat to Power (WHP) projects must achieve an annual system efficiency of at least 60% (Higher Heating Value - HHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

In order to qualify for incentives, systems must operate a minimum of 5,000 full-load equivalent hours per year (i.e. run at least 5,000 hours per year at full rated kW output). The Office of Clean Energy (OCE) may grant exceptions to this minimum operating hours requirement for Critical Facilities, provided the proposed system operates a minimum of 3,500 full-load equivalent hours per year and is equipped with blackstart and islanding capability. For this program, a Critical Facility is defined as any:

(a) public facility, including any federal, state, county, or municipal facility,

(b) non-profit and/or private facility, including any hospital, police station, fire station, water/wastewater treatment facility, school, multifamily building, or similar facility that:

(A) is determined to be either Tier 1 or critical infrastructure by the New Jersey Office of Emergency Management or the State Office of Homeland Security and Preparedness or

(B) could serve as a Shelter during a power outage. A Shelter is a facility able to provide food, sleeping arrangements, and other amenities to its residents and the community.

The CHP, FC, or WHP system must have a ten (10) year all-inclusive warranty. The warranty must cover the major components of the system eligible for the incentive, to protect against breakdown or degradation in electrical output of more than ten percent from the originally rated electrical output. The warranty shall cover the full cost of repair or replacement of defective components or systems, including coverage for labor costs to remove and reinstall defective components or systems. In the event the system warranty does not meet program requirements, customer must purchase an extended warranty or a ten (10) year maintenance/service contract. The cost of the ten (10) year warranty or service contract may be considered as part of the cost of the project. Notwithstanding the foregoing, public entities that are prohibited from entering into agreements for the full ten (10) years may comply with the 10-year requirement by:

(a) providing an agreement for the longest lawful term,
(b) committing the entity to purchase an agreement for the remaining years, and
(c) either:
(i) providing the vendor's commitment for specific pricing for those remaining years, or
(ii) assuming the pricing for the remaining years will increase by 2.5% each year

Incentive Structure:

Eligible Technologies	Size (Installed Rated Capacity)	Incentive ($/kW)	% of Total Cost Cap per project[3]	$ Cap per project[3]
Powered by non-renewable or renewable fuel source, or combination[4]: Gas Internal Combustion Engine Gas Combustion Turbine Microturbine Fuel Cells with Heat Recovery (FCHR)	≤500 kW	$2,000	30-40%[2]	$2 million
	>500 kW - 1 MW	$1,000		
	> 1 MW - 3 MW	$550	30%	$3 million
	>3 MW	$350		
Fuel Cell without Heat Recover (FCwoHR)	Same as above(1)	Applicable amount above	30%	$1 million
Waste Heat to Power	≤ 1MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

Footnotes:

(1) Incentives are tiered, which means the incentive levels vary based upon the installed rated capacity, as listed in the chart above. For example, a 4 MW CHP system would receive $2.00/watt for the first 500 kW, $1.00/watt for the second 500 kW, $0.55/watt for the next 2 MW and $0.35/watt for the last 1 MW (up to the caps listed).

(2) The maximum incentive will be limited to 30% of total project. For CHP-FC projects up to 1 MW, this cap will be increased to 40% where a cooling application is used or included with the CHP system (e.g. absorption chiller).

(3) Projects will be eligible for incentives shown above, not to exceed the lesser of % of total project cost per project cap or maximum $ per project cap. Projects installing CHP or FC with WHP will be eligible for incentive shown above, not to exceed the lesser caps of the CHP or FC incentive. Minimum efficiency will be calculated based on annual total electricity generated, utilized waste heat at the host site (i.e. not lost/rejected), and energy input.

(4) Systems fueled by a Class 1 Renewable Fuel Source, as defined by N.J.A.C. 14:8-2.5, are eligible for a 30% incentive bonus. If the fuel is mixed, the bonus will be prorated accordingly. For example, if the mix is 60/40 (60% being a Class 1 renewable), the bonus will be 18%. This bonus will be included in the final performance incentive payment, based on system performance and fuel mix consumption data. Total incentive, inclusive of bonus, shall not exceed above stipulated caps.

(5) CHP or FC systems located at Critical Facility and incorporating blackstart and islanding technology are eligible for a 25% incentive bonus. This bonus incentive will be paid with the second/Installation incentive payment. Total incentive, inclusive of bonus, shall not exceed above stipulated caps.

Incentive Payment Schedule

The total incentive is divided into three partial payments. Each stage of payment requires additional documentation and/or has conditions that must be met. At approval, the maximum incentive partial payment amounts are calculated by multiplying the total incentive by the ratios listed in the following table.

Purchase	Installation	Acceptance of 12 months post-installation performance data
30%	50%	20%

(e.g., for the purpose of calculating a payback period)

Pay for Performance Incentives

The P4P Guidelines require that a building be over the threshold of 200 kW based on the 12 months of utility bills submitted with the application. P4P Incentives will be applied for at Memorial Middle School, Meadowbrook Elementary, Margaret L Vetter Elementary and Woodmere Elementary. The program incentive structure is as follows:

Incentive #1: Energy Reduction Plan			
Incentive Amount:		$0.15	per sq ft
Minimum Incentive:		$7,500	
Maximum Incentive:		$50,000	or 50% of facility annual energy cost
Incentive #2: Installation of Recommended Measures			
Minimum Savings Target:		**15%**	
Electric Incentives	Base Incentive based on 15% savings:	$0.09	per projected kWh saved
	For each % over 15% add:	$0.005	
	Maximum Incentive:	$0.11	
Gas Incentives	Base Incentive based on 15 % savings:	$0.90	per projected Therm saved
	For each % over 15% add:	$0.05	
	Maximum Incentive:	$1.25	
Incentive Cap:		**25%**	**of total project cost**
Incentive #3: Post-Construction Benchmarking Report			
Minimum Savings Target:		**15%**	
Electric Incentives	Base Incentive based on 15% savings:	$0.09	per actual kWh saved
	For each % over 15% add:	$0.005	
	Maximum Incentive:	$0.11	
Gas Incentives	Base Incentive based on 15% savings:	$0.90	per actual Therm saved
	For each % over 15% add:	$0.05	
	Maximum Incentive:	$1.25	
Incentive Cap:		**25%**	**of total project cost**

Enhanced Incentives are available for certain facility types as listed below:

- Commercial and Industrial
- Owned or operated by Municipalities
- Owned or operated by K-12 public schools
- Located within Urban Enterprise Zones (UEZ)
- Located within Opportunity Zones (OZ)

Enhanced incentives are equal to an additional 100% of the incentives #2 and #3 listed above. The incentives are subject to a cap of 80% of the Applicant's cost for the project allocated between Incentive #2 and #3:

Incentive #2: Installation of Recommended Measures			
Enhanced Incentives	Electric Savings Additional Incentive	$0.09-$0.11	per projected kWh saved
	Gas Savings Additional Incentive	$0.90-$1.25	per projected Therm saved
	Incentive Cap:	40%	of total project cost
Incentive #3: Post-Construction Benchmarking Report			
Enhanced Incentives	Electric Savings Additional Incentive	$0.09-$0.11	per actual kWh saved
	Gas Savings Additional Incentive	$0.90-$1.25	per actual Therm saved
	Incentive Cap:	40%	of total project cost

Incentive Calculations

Estimated incentive values were calculated in accordance with the New Jersey Clean Energy Program Guidelines. The total incentive amount was calculated to be $569,877 in rebates and incentives - 54% has been applied to the project financial analysis (See Section 4). Please see below, Appendix E and Appendix F for building-by-building details.

Incentive Totals

BUILDING	INCENTIVE TYPE	QUANTITY	UNITS	INCENTIVE $/UNIT	INSTALL INCENTIVE	YEAR 1 INCENTIVE	YEAR 2 INCENTIVE	SUBTOTAL	TOTAL
EATONTOWN BOARD OF EDUCATION	P4P 2&3 (electric)	1,139,974	kWh	$0.44	$0	$250,794	$250,794	$501,588	$569,877
	P4P 2&3 (natural gas)	13,419	therms	$5.00	$0	$33,547	$33,547	$67,093	
	Direct Install				$0	$0	$0	$0	
	SmartStart	Various	Various	Various	$0	$1,195	$0	$1,195	
	Combined Heat & Power	0	kW	$0	$0	$0	$0	$0	
	Demand Response	0	kW		$0	$0	$0	$0	
	Energy Efficiency	192	kW	$32.45	$0	$0	$0	$0	
	Sustainable New Jersey	0			$0	$0	$0	$0	
					$0	$0	$0	$0	
				TOTALS	$0	$285,536	$284,341	$569,877	

Incentive Data

BUILDING	INCENTIVE TYPE	QUANTITY	UNITS	INCENTIV $/UNIT	INSTALL INCENTIVE	YEAR 1 INCENTIVE	YEAR 2 INCENTIVE	SUBTOTAL	TOTAL
Memorial Middle School	P4P 2&3 (electric)	402,838	kWh	$0.44		$88,624	$88,624	$177,249	$202,048
Memorial Middle School	P4P 2&3 (natural gas)	4,960	therms	$5.00		$12,399	$12,399	$24,799	
Meadowbrook Elementary	P4P 2&3 (electric)	265,523	kWh	$0.44		$58,415	$58,415	$116,830	$131,595
Meadowbrook Elementary	P4P 2&3 (natural gas)	2,953	therms	$5.00		$7,382	$7,382	$14,765	
Margaret L Vetter Elementary	P4P 2&3 (electric)	260,641	kWh	$0.44		$57,341	$57,341	$114,682	$135,268
Margaret L Vetter Elementary	P4P 2&3 (natural gas)	4,117	therms	$5.00		$10,293	$10,293	$20,586	
Woodmere Elementary	P4P 2&3 (electric)	210,972	kWh	$0.44		$46,414	$46,414	$92,828	$99,771
Woodmere Elementary	P4P 2&3 (natural gas)	1,389	therms	$5.00		$3,472	$3,472	$6,944	
Transportation Facility	SmartStart	Various	Various	Various		$1,195		$1,195	$1,195

No implied and/or written guarantee is being made with respective to the receipt of incentives. All incentives estimates carry inherent risks that may jeopardize the receipt of them. Therefore, Eatontown Board of Education acknowledges and accepts that any project proposed should not rely on the receipt of incentives as a reason to implement it.

ECM 1 - LED Lighting Replacement with Controls

EATONTOWN BOARD OF EDUCATION		Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✓ ECM was evaluated						
ECM included in the project						
ECM	ECM DESCRIPTION					
1	LED Lighting Replacement	✓	✓	✓	✓	✓

Background & Existing Conditions

Lighting retrofits can greatly reduce energy consumption and lower energy bills, while maintaining lighting levels and quality by upgrading lighting components to more efficient and advanced technologies. Upgrading technologies can also offer employees greater control over lighting, allowing for additional energy savings.

Improvements in lighting technologies have led to increased lifetimes for components that will result in fewer failures and lengthen the time between maintenance activities.

The implementation of a routine maintenance program in addition to the lighting retrofit will greatly simplify the maintenance practices and reduce the operational costs.

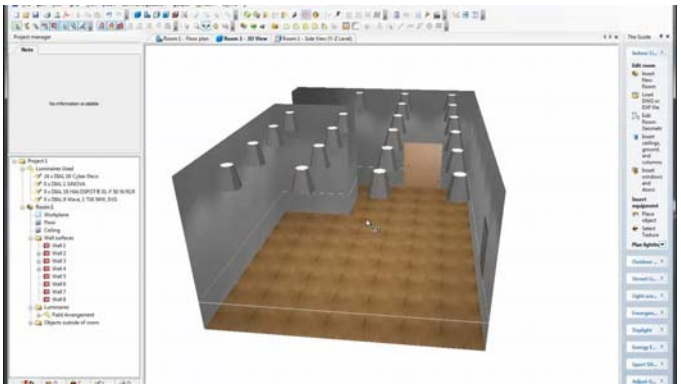
Several new LED lighting lamp and fixture products are now available that were not viable a few years ago. While conventional HID fixtures are controlled only by photocell and timer technologies to turn either on and off, the use of LED fixtures and digital technology allows additional trimming and the use of motion/occupancy-based controls to limit the output of exterior fixtures when sufficient natural lighting is present or for periods when the parking lots and authority grounds are unoccupied.

The replacement of existing fixture heads with premium efficiency / LED-based fixtures is the basis of this listed ECM.

Lighting Level Testing and Commissioning

Assuring that the lighting levels of the interior and exterior spaces are a critical component of lighting retrofit project. Each space being retrofitted will have lighting levels measured and recorded during the design phase of the project.

The lighting system will be designed to assure that the lighting levels meet code and either meet or exceed the existing levels. Lighting measurements will be taken per IES Standards.



When the retrofit has been completed, the lighting levels in each space will be measured again to assure compliance with the system design. All documentation will be delivered to Eatontown Board of Education for approval and record.

Existing interior lighting at Memorial Middle School and Margaret L Vetter Elementary

Scope of Work

- Retrofit the existing fixtures with new LED Bulbs.
  - Disconnect power at the breaker panel for the existing fixture circuit
  - Remove and dispose of existing bulbs and ballasts in a responsible manner
  - Install new ballast
  - Install new sockets (as necessary)
  - Install new bulbs
  - Test new fixture for operation and performance
  - Test existing space for proper lighting levels

- All Retrofit Components will be UL Listed
- Bid documents will call for UL Inspection of each retrofitted fixture

ECM Calculations

Energy Savings from the installation of new LED lighting is based on the reduction in electric power (Watts) from the existing bulbs/fixtures to new LED bulbs/fixture and were modeled using eQuest. See Section 2 for breakdowns of the baseline model energy consumption. The spreadsheet calculations below were entered into the eQuest models to determine energy savings. eQuest also accounts for HVAC cooling savings and heating increase from the reduction in lighting loads. A 57% coincidence factor was applied to the model demand savings to account for unknowns associated with estimating building peak demand.

LED Lighting

BUILDING	SQFT	SPACE	kW_{base}	LPD_{base} (w/sf)	kW_{inst}	LPD_{inst} (w/sf)	ΔkW	CF	Annual Run Hours	Demand Savings (kW)
Memorial Middle School	58,225	INTERIOR	78.97	1.36	27.10	0.47	51.9	0.57	2,575	29.6
		EXTERIOR	3.42		2.10		1.3	0.57	4,308	0.8
Meadowbrook Elementary	42,605	INTERIOR	56.50	1.33	18.96	0.44	37.5	0.57	2,305	21.4
		EXTERIOR	4.95		1.33		3.6	0.57	4,380	2.1
Margaret L Vetter Elementary	33,635	INTERIOR	48.88	1.45	16.53	0.49	32.4	0.57	2,305	18.4
		EXTERIOR	2.38		1.22		1.2	0.57	4,380	0.7
Woodmere Elementary	44,510	INTERIOR	60.2	1.35	20.3	0.46	39.9	0.57	2,305	22.8
		EXTERIOR	6.54		1.6		4.9	0.57	4,380	2.8
Transportation Facility	10,800	INTERIOR	4.56	0.42	1.53	0.14	3.0	0.57	2,141	2.0
		EXTERIOR	2.58		0.70		1.9	0.57	4,380	1.2

The simulation results from the LED Lighting Replacement are shown below. Please see Appendix F for Lighting Line by Lines

LED Lighting Replacement Savings

BUILDING	SQFT	MODEL % DEMAND SAVINGS	COINCIDENCE FACTOR	kW Savings	MODEL % ELECTRIC SAVINGS	kWh SAVINGS	MODEL % THERM SAVINGS	THERM SAVINGS
Memorial Middle School	58,225	11.8%	57%	22	13.1%	145,882.4	-2.8%	(576)
Meadowbrook Elementary	42,605	3.2%	57%	5	15.0%	96,775.9	-1.6%	(295)
Margaret L Vetter Elementary	33,635	1.0%	57%	2	14.8%	89,752.7	-2.0%	(436)
Woodmere Elementary	44,510	4.6%	57%	11	11.7%	108,397.0	-2.2%	(112)

CALCULATED SAVINGS

LED Lighting Replacement Savings

BUILDING	SQFT	SPACE	kW_{base}	LPD_{base}	kW_{inst}	LPD_{inst}	ΔkW	IF	CF	Existing EFLH	Demand Savings (kW)	Energy Savings (kWh)
Transportation Facility	10,800	INTERIOR	4.56	0.42	1.53	0.14	3.0	0.15	0.57	2,141	2.0	7,463
		EXTERIOR	2.58	0.24	0.70	0.06	1.9	0.15	0.57	4,380	1.2	9,444
		SPECIAL		0		0	0				0	0

Algorithms

Demand Savings = (ΔkW) X (CF) X (1+ IF)

Energy Savings = (ΔkW) X (1 + IF) X (EFLH)

ΔKW = (Number of fixtures installed X baseline wattage for new fixture) – (number of replaced fixtures X wattage from table)

IF = Interactive Factor

0.28 = Conversion from kW to tons (Refrigeration)

Eff = Efficiency of typical refrigeration system in kW/ton

Definition of Variables

ΔkW = Change in connected load from baseline to efficient lighting level.

CF = Coincidence Factor

EFLH = Equivalent Full Load Hours

- For building types outside the scope of **Table 4-3**, annual lighting hours, excluding impact of lighting controls, shall not exceed the sum of the following:
    - (Weekday hours per week open) x 50.6 weeks x 90%
    - (Weekday hours per week closed) x 50.6 weeks x 5% + 9.6 hours
    - (Weekend hours per week open) x 52 weeks x 90%
    - (Weekend hours per week closed) x 52 weeks x 5%

  For example, if a library is open 9-6pm Monday through Friday, open 9-1pm on Saturday, and closed on Sunday, annual lighting hours shall not exceed 2,550, which is calculated as the sum of the following:
    - (45 hours per week open on weekdays) x 50.6 weeks x 90% = 2,049 hours
    - (75 hours per week closed on Weekdays) x 50.6 weeks x 5% + 9.6 = 200 hours
    - (4 hours per week open on weekends) x 52 weeks x 90% = 187 hours
    - (44 hours per week closed on weekends) x 52 weeks x 5% = 114 hours

ECM 2 - Energy Management System

EATONTOWN BOARD OF EDUCATION		Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated						
ECM included in the project						
ECM	**ECM DESCRIPTION**					
2	Upgrade and Enhance Energy Management System	✔	✔	✔	✔	

Background & Existing Conditions

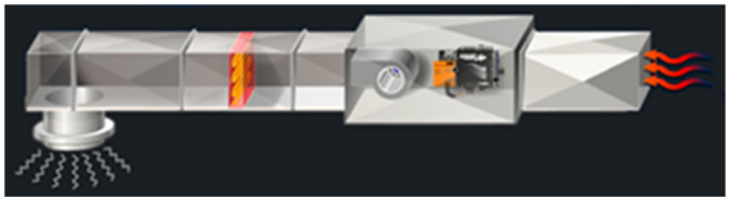
Energy Management Systems (EMS) are systems comprised of sensors, operators, processors, and a front-end user interface that controls and monitors electrical and mechanical building systems. Such systems provide automated control and monitoring of the heating, cooling, ventilation, lighting and performance of a building or group of buildings. The energy management system will provide Eatontown Board of Education with continuous monitoring & reporting of the Electric and Gas Meters.

Web Based Building Automation Interface

Having building systems monitored from a central location enables the operator to receive alerts and predict future problems or troublesome conditions. The data obtained from these can be used to produce a trend analysis and annual consumption forecasts. Advanced control strategies implemented using these systems such as time scheduling, optimum start and stop, night set-back, demand-controlled ventilation, and peak demand limiting. The auditor will be able to use the EMS to diagnose current building system problems as well as tailor specific energy savings strategies that utilize the full capability of the given EMS.

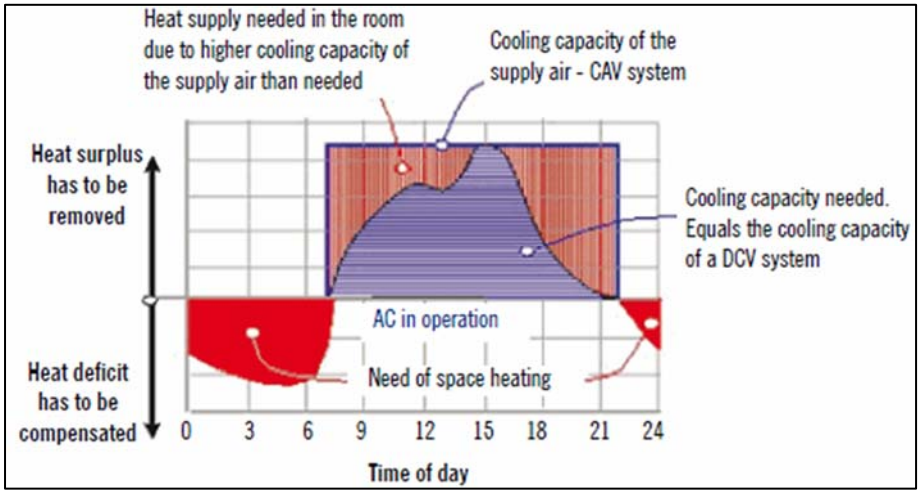
The new District Wide EMS will remove existing pneumatics and, replace or integrate existing proprietary systems with new DDC Controls. Control strategies will be designed and programmed into the system to maintain building comfort while operating the building mechanical system in the most efficient manner possible. Strategies include:

1. Occupancy Scheduling
2. Building Wide Night Set Back
3. Morning Warm Up
4. Individual Room Temperature Set Point Control
5. Supply Air Temperature Reset
6. Chilled & Heating Supply Water Temperature Resets
7. Economizer Control
8. CO2 Ventilation Control



Demand Control Ventilation - Background & Existing Conditions

In most commercial occupancies, ventilation is provided to deal with two types of indoor pollution: (1) odors from people, and (2) off-gassing from building components and furniture. When a space is vacant, it has no people pollution, so the people-related ventilation rate is not needed. Many types of high-occupancy spaces, such as classrooms, multipurpose rooms, theaters, conference rooms, or lobbies have ventilation designed for a high peak occupancy that rarely occurs. Ventilation can be reduced during the many hours of operation when spaces are vacant or at lower than peak occupancy. When ventilation is reduced, building owners or operators save energy because it is not necessary to heat or cool as much outside air. In colder climates, heating for ventilation air is greater and DCV saves the most energy.



Building	Name	Areas Served	Quantity	Type	Existing DCV
Memorial Middle School	RTU [M-AC-1]	Classrooms 10-20, FCS, App Tech	1	Variable Air Volume	Yes
	RTU [M-AC-2]	Classrooms 1-8, 9A&9B, Art Room, Office Areas	1	Variable Air Volume	Yes
	RTU [M-AC-3]	All Purpose Room	1	Single Zone	No
	RTU [M-AC-4A]	Gym	1	Single Zone	No
	RTU [M-AC-4B]	Gym	1	Single Zone	No
	RTU [M-AC-5]	Media Center	1	Single Zone	No
	RTU [M-AC-6]	Music Rm 140	1	Single Zone	No
	RTU [M-AC-7]	21c	1	Single Zone	No
	RTU [M-AC-8]	21A & 21B	1	Single Zone	No
	RTU [M-AC-9]	Gym offices & Hallway	1	Single Zone	No
	RTU [AC-1]	Administration Section	1	Single Zone	No
	RTU [AC-2]	Administration Section	1	Single Zone	No
	RTU [AC-3]	Administration Section	1	Single Zone	No
Meadowbrook Elementary School	RTU [B-AC-1]	Office Areas & Kindergarten Rooms	1	Variable Air Volume	Yes
	RTU [B-AC-2]	Classrooms 12-15,6-11, & Art Room Area	1	Variable Air Volume	Yes
	RTU [B-AC-3]	Classrooms 16-18, 19, 30-32	1	Variable Air Volume	Yes
	RTU [B-AC-4]	Multi- Purpose Room & Stage	1	Single Zone	No
Vetter Elementary School	RTU [V-AC-1]	Classrooms 1-8, Library	1	Variable Air Volume	Yes
	RTU [V-AC-2]	Classrooms 9-21, Nurse	1	Variable Air Volume	Yes
	RTU [V-AC-3]	Multi- Purpose Room & Stage	1	Single Zone	No
Woodmere Elementary School	RTU [W-AC-1]	Classrooms 1-6, Office Areas	1	Variable Air Volume	Yes
	RTU [W-AC-2]	Classrooms 7-11	1	Variable Air Volume	Yes
	RTU [W-AC-3]	Classrooms 12-16	1	Variable Air Volume	Yes
	RTU [W-AC-4]	Classrooms 17-20, K-1, K-2	1	Variable Air Volume	Yes
	RTU [W-AC-5]	MPR	1	Single Zone	No
	RTU [W-AC-6]	MPR	1	Single Zone	No

Demand Control Ventilation Operation

The objective of a CO2 control strategy is to modulate ventilation to maintain target cfm/person ventilation rates based on actual occupancy. The strategy should allow for reduced overall ventilation during periods of less than full occupancy which will save energy. Typical control approaches have used a proportional or proportional-integral control algorithm to modulate ventilation between a base ventilation rate established for non-occupant-related sources and the design ventilation rate for the space. Typically, modulation of outside air above base ventilation begins when indoor CO2 is 100 ppm above outside levels and continues until the target CO2 levels are reached and the design ventilation rate is provided.

Duct sensors are best used where a single space or multiple spaces with common occupancy patterns are being ventilated. An example of this approach would be to place a sensor in the return duct of an air handler that serves multiple classrooms, using an upper limit set point of 500 or 600 ppm CO2 above ambient (instead of 700 ppm). Polarized-media electronic air cleaners can allow for the upper CO2 limit to be raised to 1,500 ppm. This approach works best when the AHU system is serving spaces that are occupied with very similar schedules and rates.

Existing Conditions at Vetter Elementary and Memorial Middle School

Scope of Work – Web Based, District Wide Energy Management System

This measure involves replacing the existing control system with an open-protocol, web-based Energy Management system. This will include replacing control valves with DDC for heating equipment, outdoor air dampers, start up and shut down of the exhaust fans and sensors for controlling these devices. All new equipment will also be integrated into a District-wide front-end. District assigned operators will have remote access to system.

The proposed energy management system will be able to vary the operation of the unit, outdoor air damper, space temperature set points, and air conditioning systems (if applicable). This will include zone scheduling, temperature setback and unoccupied outdoor air shut off. Each building will be provided with electric and natural gas submetering for continuous monitoring and reporting of building energy consumption via Energy Dashboards.

A more specific scope of work includes:

- Building Automation Systems shall be accessible via the Internet.
- User shall have the ability to view the system graphics, change set points, perform overrides, view schedules, change schedules, view alarms, acknowledge alarms, view trend information as well as print, save & e-mail trend information.
- A Secure Internet Connection to the District Network shall be provided and managed by the District IT Department.
- 3-D Graphics Package will be provided for navigating the Building Automation System as well as viewing floor plans, system graphics and equipment graphics.

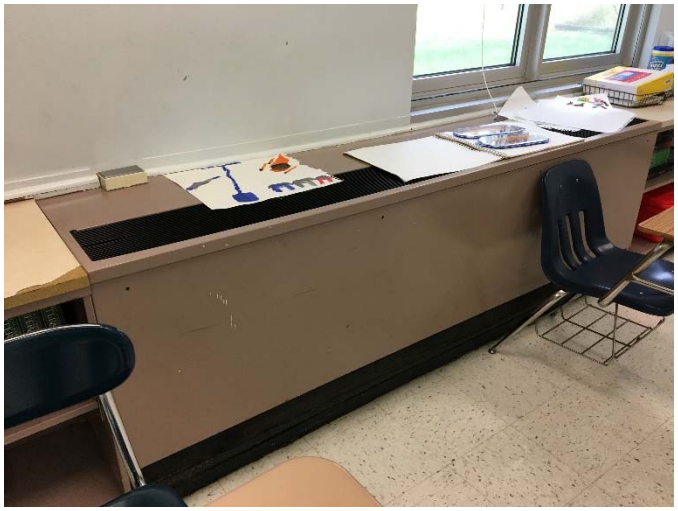
Remote access and mobile interface

- An Energy Monitoring Dashboard will be provided to display and report Gas & Electrical Consumption for each building detailed in this proposal.
- The District Facilities and IT Staff will receive full training on the operation of the system.
- Portable tablets will be provided for remote and mobile BAS Interface.

Scope of Work – Memorial Middle School

- Upgrade network to integrate to the new District Wide Energy Management System
- (1) Boiler Plant
    - New Open Protocol boiler plant controller
    - Wiring of existing boiler plant end devices to new open protocol boiler plant controller
    - Integration of new boiler plant controls into the new District Wide Energy Management System
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

- (28) VAV Boxes
    - Integration of existing VAV controller in the new District Wide Energy Management System
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System
- (24) Unit Ventilators
    - Existing UV contains DDC Controls & End Devices
    - Existing UV OA Damper closed, and supply fan disabled with ventilation air coming from RTUs
    - UV currently controlled by corresponding VAV box and HW Coil Control valve will be addressed under the VAV box integration



  - Enhanced 3D graphics will be provided in the new District Wide Energy Management System
- (6) New Packaged Rooftop Units
  - New Packaged Rooftop Units will be provided with new BACnet Open Protocol Interface and will be integrated into the new District Wide Energy Management System
  - Enhanced 3D graphics will be provided in the new District Wide Energy Management System
- (7) Existing Packaged Rooftop Units
  - Existing Trane LonTalk MP580 controller will be removed and replaced with new BACnet Open Protocol Controller
  - Wiring of existing end devices to new open protocol boiler plant controller
  - Integration of new controls into the new District Wide Energy Management System
  - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

Scope of Work – Meadowbrook Elementary

- Upgrade network to integrate to the new District Wide Energy Management System
- (1) Boiler Plant
    - New Open Protocol boiler plant controller
    - Wiring of existing boiler plant end devices to new open protocol boiler plant controller
    - Integration of new boiler plant controls into the new District Wide Energy Management System
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

- (27) VAV Boxes
    - Integration of existing VAV controller in the new District Wide Energy Management System
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System
- (19) Unit Ventilators
    - Existing UV contains DDC Controls & End Devices
    - Existing UV OA Damper closed, and supply fan disabled with ventilation air coming from RTUs
    - UV currently controlled by corresponding VAV box and HW Coil Control valve will be addressed under the VAV box integration
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

- (3) New Packaged Rooftop Units
    - New Packaged Rooftop Units will be provided with new BACnet Open Protocol Interface and will be integrated into the new District Wide Energy Management System

  - Enhanced 3D graphics will be provided in the new District Wide Energy Management System
- (1) Existing Packaged Rooftop Units
  - Existing Trane LonTalk MP580 controller will be removed and replaced with new BACnet Open Protocol Controller
  - Wiring of existing end devices to new open protocol boiler plant controller
  - Integration of new controls into the new District Wide Energy Management System
  - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

Scope of Work – Margaret L Vetter Elementary

- Upgrade network to integrate to the new District Wide Energy Management System
- (1) Boiler Plant
    - New Open Protocol boiler plant controller
    - Wiring of existing boiler plant end devices to new open protocol boiler plant controller
    - Integration of new boiler plant controls into the new District Wide Energy Management System
    - (4) New VFD Pumps
        - Pump Start/Stop
        - Pump Status
        - VFD Speed
        - VFD Alarm
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

- (30) New VAV Boxes
    - Integration of existing VAV controller in the new District Wide Energy Management System
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System
- (24) Unit Ventilators
    - Existing UV contains DDC Controls & End Devices
    - Existing UV OA Damper closed, and supply fan disabled with ventilation air coming from RTUs
    - UV currently controlled by corresponding VAV box and HW Coil Control valve will be addressed under the VAV box integration
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

- (2) New Packaged Rooftop Units
  - New Packaged Rooftop Units will be provided with new BACnet Open Protocol Interface and will be integrated into the new District Wide Energy Management System
  - Enhanced 3D graphics will be provided in the new District Wide Energy Management System
- (1) Existing Packaged Rooftop Units
  - Existing Trane LonTalk MP580 controller will be removed and replaced with new BACnet Open Protocol Controller
  - Wiring of existing end devices to new open protocol boiler plant controller
  - Integration of new controls into the new District Wide Energy Management System
  - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

Scope of Work – Woodmere Elementary

- Upgrade network to integrate to the new District Wide Energy Management System
- (34) VAV Boxes
    - Integration of existing VAV controller in the new District Wide Energy Management System
    - Electric Baseboard currently controlled by corresponding VAV box will be addressed under the VAV box integration
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

- (3) New Packaged Rooftop Units
    - New Packaged Rooftop Units will be provided with new BACnet Open Protocol Interface and will be integrated into the new District Wide Energy Management System
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System
- (6) Existing Packaged Rooftop Units
    - Existing Trane LonTalk MP580 controller will be removed and replaced with new BACnet Open Protocol Controller
    - Wiring of existing end devices to new open protocol boiler plant controller
    - Integration of new controls into the new District Wide Energy Management System
    - Enhanced 3D graphics will be provided in the new District Wide Energy Management System

ECM Calculations

Energy Savings from the installation of a District Wide Energy Management System were modeled using eQuest. The simulation results are shown below.

Energy Management System Savings							
BUILDING	MODEL % ELECTRIC SAVINGS	kWh SAVINGS	MODEL % DEMAND SAVINGS	kW SAVINGS	MODEL % THERM SAVINGS	MAX % HEATING SAVINGS	THERM SAVINGS
Memorial Middle School	19.1%	213,236	2.1%	7	27.5%	30.0%	5,599
Meadowbrook Elementary	20.9%	135,210	6.2%	18	17.9%	30.0%	3,247
Margaret L Vetter Elementary	21.4%	130,211	19.6%	60	23.1%	30.0%	5,100
Woodmere Elementary	8.2%	76,347	5.4%	23	37.7%	**30.0%**	1,501

Note:

- See existing and proposed temperature, fan and DCV schedules in Appendix H. In general, the existing temperatures were set back at 9 pm. This ECM sets the building temperature back at 6pm during the week and sets the minimum ventilation to 5% of supply air when the spaces are unoccupied. The existing building temperature set points, setbacks and design ventilation rates are unchanged.

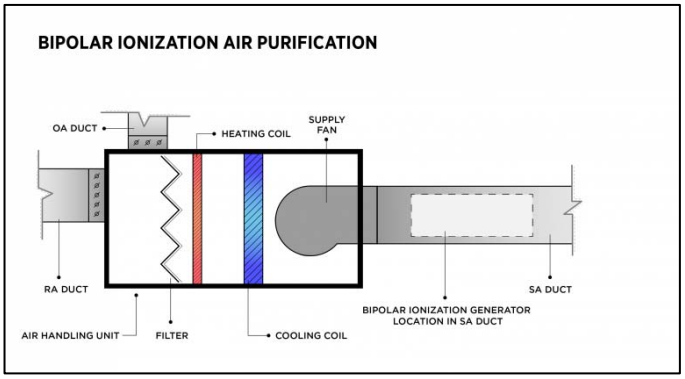
ECM 3- Bi-Polar Ionization Advanced Filtration

EATONTOWN BOARD OF EDUCATION	Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated					
ECM included in the project					
ECM # — ECM DESCRIPTION					
3 — Bi-Polar Ionization Advanced Filtration	✔	✔	✔	✔	

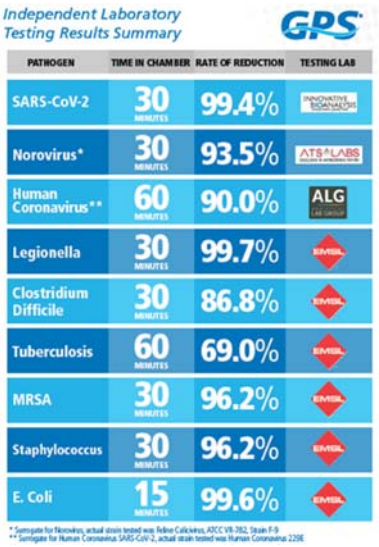
ECM WAS EVALUATED BUT WAS NOT INCLUDED IN THE ESIP PROJECT

Background & Existing Conditions

Pathogens such as mold, viruses and bacteria can all be suspended in the air we breathe, virtually invisible to the eye. Along with pathogens, pollutants, dust, dander, pollen, and smoke can also be intertwined in incoming ventilation air for buildings. Bipolar ionization has become a beneficial way to increase indoor air quality and provide safe and healthy ventilation air to building occupants.



Bi-polar ionization produces a natural bio-climate which is rich in positive and negative oxygen ions. The negative ions contain an extra electron while the positive ions are missing an electron resulting in an unstable condition. To restabilize, these bipolar ions seek out atoms and molecules in the air to trade electrons with, effectively neutralizing particulate matter, bacteria and virus cells, odorous gases and aerosols, and VOCs. Bi-polar ionizers can be installed in the supply air of ductwork or in the HVAC unit itself. Ionizers can also be installed in both new equipment and be retrofitted into older systems. Recently, Bi-polar ionization has been highlighted as a key method in combating the Covid-19 outbreak within indoor air of commercial, educational and government buildings.



Bi-Polar Ionization Advanced Filtration will be installed on the following RTUs

Advanced Filtration Scope of Work				
BUILDING	Description	Notes	Tons	QUANTITY
Memorial Middle School	Packaged VAV-RTU: 50-Tons / RTU [M-AC-1]	Classrooms 10-20, FCS, App Tech	50	1
	Packaged VAV-RTU: 50-Tons / RTU [M-AC-2]	Classrooms 1-8, 9A&9B, Art Room, Office Areas	50	1
	Packaged SZ-RTU: 20-Tons / RTU [M-AC-3]	All Purpose Room	20	1
	Packaged SZ-RTU: 20-Tons / RTU [M-AC-4A]	Gym	20	1
	Packaged SZ-RTU: 20-Tons / RTU [M-AC-4B]	Gym	20	1
	Packaged SZ-RTU: 10-Tons / RTU [M-AC-5]	Media Center	10	1
	Packaged SZ-RTU: 7.5-Tons / RTU [M-AC-6]	Music Rm 140	7.5	1
	Packaged SZ-RTU: 3-Tons / RTU [M-AC-7]	21c	3	1
	Packaged SZ-RTU: 7.5-Tons / RTU [M-AC-8]	21A & 21B	7.5	1
	Packaged SZ-RTU: 4-Tons / RTU [M-AC-9]	Gym offices & Hallway	4	1
	Packaged SZ-RTU: 3-Tons / RTU [AC-1]	Administration Section	3	1
	Packaged SZ-RTU: 4-Tons / RTU [AC-2]	Administration Section	4	1
	Packaged SZ-RTU: 3-Tons / RTU [AC-3]	Administration Section	3	1
Meadowbrook Elementary	Packaged VAV-RTU: 30-Tons / RTU [B-AC-1]	Office Areas & Kindergarten Rooms	30	1
	Packaged VAV-RTU: 35-Tons / RTU [B-AC-2]	Classrooms 12-15,6-11, & Art Room Area	35	1
	Packaged VAV-RTU: 30-Tons / RTU [B-AC-3]	Classrooms 16-18, 19, 30-32	30	1
	Packaged SZ-RTU: 30-Tons / RTU [B-AC-4]	Multi- Purpose Room & Stage	30	1
Margaret L Vetter Elementary	Packaged VAV-RTU: 50-Tons / RTU [V-AC-1]	Classrooms 1-8, Library	50	1
	Packaged VAV-RTU: 50-Tons / RTU [V-AC-2]	Classrooms 9-21, Nurse	50	1
	Packaged VAV-RTU: 20-Tons / RTU [V-AC-3]	Multi- Purpose Room & Stage	20	1
Woodmere Elementary	Packaged VAV-RTU: 35-Tons / RTU [W-AC-1]	Classrooms 1-6, Office Areas	35	1
	Packaged VAV-RTU: 35-Tons / RTU [W-AC-2]	Classrooms 7-11	35	1
	Packaged VAV-RTU: 27.5-Tons / RTU [W-AC-3]	Classrooms 12-16	27.5	1
	Packaged VAV-RTU: 27.5-Tons / RTU [W-AC-4]	Classrooms 17-20, K-1, K-2	27.5	1
	Packaged SZ-RTU: 17.5-Tons / RTU [W-AC-5]	MPR	17.5	1
	Packaged SZ-RTU: 17.5-Tons / RTU [W-AC-6]	MPR	17.5	1

Existing roof top units at Vetter Elementary and Woodmere Elementary

ECM Calculations

There are no Energy Savings associated with this Energy Conservation Measure.

ECM 4 – Steam to Hot Water Conversion

ECM 5 – Steam Boiler Replacement with Additional Boiler Installation

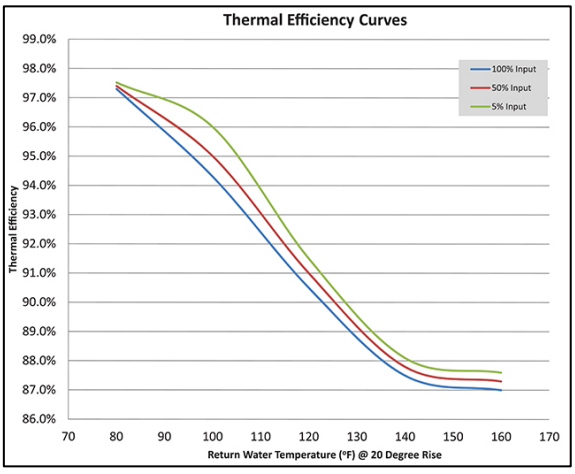
ECM 6 – Condensing Boiler Installation

EATONTOWN BOARD OF EDUCATION	Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✓ ECM was evaluated					
ECM included in the project					
ECM	**ECM DESCRIPTION**				
4	Steam to Hot Water Conversion		✓		
5	Steam Boiler Replacement with additional Condensing Boiler Installation		✓		
6	Condensing Boiler Installation		✓		

ECMS WERE EVALUATED BUT WERE NOT INCLUDED IN THE ESIP PROJECT

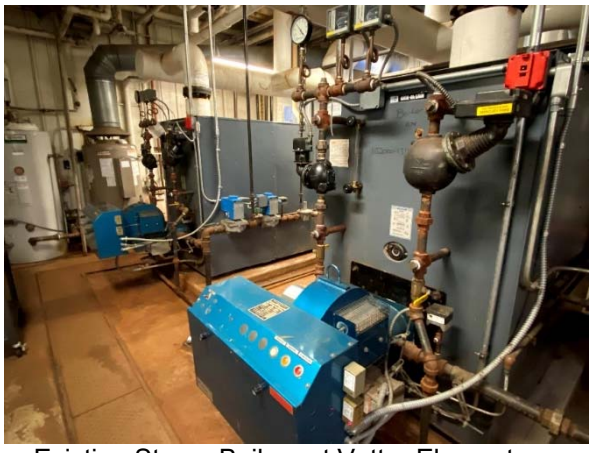
Background & Existing Conditions

Old, oversized boiler systems have efficiencies in the range of 56%–75%. A condensing boiler hot water heating system can achieve efficiencies as high as 97%, converting nearly all the fuel to useful heat. The efficiency of the boiler increases at lower return water temperature. Lower return water temperatures allow more water vapor from the exiting flue gas to condense, allowing its latent heat of vaporization to be recovered.



Margaret L Vetter Elementary contains (2) Steam Boilers, (2) Hot Water Loops and (1) Steam Loop which condition different parts of the building. From the steam to hot water heat exchanger, a hot water loops run through center and west wing of the building. A hot water loop also runs down the eastern interior hallway conditions this space and two bathrooms. The steam loop runs from the boiler room around the classrooms and library on the perimeter of the eastern wing of the building. The layout of spaces conditioned by steam and hot water are shown below:

Margaret L Vetter Elementary currently has (2) 3,103 MBH Weil McLain steam boilers and (1) steam to hot water heat exchanger. A recent boiler efficiency test was not conducted. An existing boiler efficiency of 75.1% is being used for energy savings.


Existing Steam Boilers at Vetter Elementary


Existing Heat Exchanger at Vetter Elementary


Existing Steam Loop at Vetter Elementary


Existing baseboard in steam loop classroom

DCO evaluated (3) three different scenario Energy Conservation Measures which correlate to the existing Steam and Hot Water Loop arrangement at Margaret L Vetter Elementary. Only (1) one scenario ECM related to this arrangement of the three proposed can be chosen.

Margaret L Vetter Elementary – Steam to Hot Water Conversion

Approximately 500 linear feet of east wing steam piping, conditioning 7,000 sqft of interior space, will be replaced with hot water piping. The existing baseboard in each classroom/library space will be replaced with new hot water baseboard. Existing Weil McLain boilers are to be replaced with (2) 3,000 MBH high efficiency condensing hot water boilers. Along with the removal of the steam loop, the heat exchanger will be removed from the boiler room.

Margaret L Vetter Elementary – Steam Boiler Replacement with Additional Boiler Installation

The steam piping will remain to condition 7,000 sqft of interior space along the east wing of the building. Existing Weil McLain boilers will be replaced with (2) 1,035 MBH steam boilers only serving the existing east wing steam loop. The steam to hot water heat exchanger will be removed from the boiler room and replaced with (2) 2,000 MBH condensing hot water boilers. These boilers will only serve the existing hot water loop.

Margaret L Vetter Elementary – Condensing Boiler Installation

The steam piping will remain to condition 7,000 sqft of interior space along the east wing of the building. Existing Weil McLain boilers will remain to serve the existing east wing steam loop. The steam to hot water heat exchanger will be removed and replaced with (2) 2,000 MBH condensing hot water boilers. These boilers will only serve the existing hot water loop.

ECM Calculations – Steam to Hot Water Conversion

Energy Savings from the installation of higher efficiency condensing boilers were modeled using eQuest.

Hot Water and Steam Loops – The condensing boilers were modeled at 87% efficiency at 160F return water. The default eQuest condensing boiler efficiency curve increases efficiency as return water temperature decreases. The new control system will utilize hot water reset – 180F supply at 20F ambient to 120F supply at 55F ambient. A 15:1 turndown ratio was used to limit cycling losses. The simulation results from the higher efficiency units are shown below.

ENERGY MODELING OUTPUTS

Steam to HW Conversion Savings

BUILDING	SQFT	MODEL % ELECTRIC SAVINGS	kWh SAVINGS	BOILER % THERM SAVINGS	CHP REDUCTION OF BOILER LOAD (%)	THERM SAVINGS
Margaret L Vetter Elementary	33,635	-0.2%	(984)	16.8%	34.0%	2,457

Note: Margaret L Vetter Elementary will be receiving a 35-kW combined heat and power unit. The boiler savings were reduced to account for the heat provided by the proposed CHP.

ECM Calculations – Steam Boiler Replacement with Additional Boiler Installation

Energy Savings from the installation of higher efficiency condensing boilers were modeled using eQuest.

Hot Water Loop: The condensing boilers were modeled at 87% efficiency at 160F return water. The default eQuest condensing boiler efficiency curve increases efficiency as return water temperature decreases. The new control system will utilize hot water reset – 180F supply at 20F ambient to 120F supply at 55F ambient. A 15:1 turndown ratio was used to limit cycling losses. The simulation results from the higher efficiency units are shown below.

Steam Loop: The new steam boilers were modeled at 83% efficiency. A 4:1 turndown ratio was used to limit cycling losses. The simulation results from the higher efficiency units are shown below.

ENERGY MODELING OUTPUTS							
Boiler Replacement							
BUILDING	SQFT	MODEL % ELECTRIC SAVINGS	kWh SAVINGS	STEAM BOILER % THERM SAVINGS	HOT WATER BOILER % THERM SAVINGS	CHP REDUCTION OF HOT WATER LOAD (%)	THERM SAVINGS
Margaret L Vetter Elementary	33,635	-0.1%	(787)	4.3%	9.3%	45.5%	2,071

Note: Margaret L Vetter Elementary will be receiving a 35-kW combined heat and power unit. The boiler savings were reduced to account for the heat provided by the proposed CHP.

ECM Calculations – Condensing Boiler Installation

Energy Savings from the installation of higher efficiency condensing boilers were modeled using eQuest.

Hot Water Loop: The condensing boilers were modeled at 87% efficiency at 160F return water. The default eQuest condensing boiler efficiency curve increases efficiency as return water temperature decreases. The new control system will utilize hot water reset – 180F supply at 20F ambient to 120F supply at 55F ambient. A 15:1 turndown ratio was used to limit cycling losses. The simulation results from the higher efficiency units are shown below.

Steam Loop: No changes to existing steam boilers modeled for savings.

ENERGY MODELING OUTPUTS							
Condensing Boiler Installation Savings							
BUILDING	**SQFT**	**MODEL % ELECTRIC SAVINGS**	**kWh SAVINGS**	**STEAM BOILER % THERM SAVINGS**	**HOT WATER BOILER % THERM SAVINGS**	**CHP REDUCTION OF BOILER LOAD (%)**	**THERM SAVINGS**
Margaret L Vetter Elementary	33,635	-0.1%	(753)	0.0%	13.4%	45.5%	1,612

Note: Margaret L Vetter Elementary will be receiving a 35-kW combined heat and power unit. The boiler savings were reduced to account for the heat provided by the proposed CHP.

ECM 7 – Burner Replacement

EATONTOWN BOARD OF EDUCATION		Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated						
ECM included in the project						
ECM	ECM DESCRIPTION					
7	Burner Replacement			✔		

ECM WAS EVALUATED BUT WAS NOT INCLUDED IN THE ESIP PROJECT

Background & Existing Conditions

An efficient boiler burner provides the proper air-to-fuel mixture throughout the full range of firing rates, without constant adjustment. Many burners with complex linkage designs do not hold their air-to-fuel settings over time. Often, they are adjusted to provide high excess air levels to compensate for inconsistencies in the burner performance.

A linkage less burner with O-trim controls allows for the burner to maintain an optimal air to fuel mix ratio during all firing rates. This is achieved by measuring the excess oxygen levels in the flue while the burner fires. The burner then varies the air to fuel mix ratio in real time, as needed, to maintain optimal combustion efficiency. This leads to reduced fuel consumption and associated costs.

In the event a complete boiler replacement is not economically feasible, a burner replacement upgrade can be recommended to improve the efficiency of the existing boilers. Installation of new linkage less burner and O-trim controls will be included. See the Boiler Replacement ECM for existing burners.

Margaret L Vetter Elementary has (2) existing burners, one for each steam boiler. Existing burners to be replaced with new high efficiency burners.

Existing burner at Vetter Elementary

ECM Calculations

Energy Savings from the installation of high efficiency burners were modeled using eQuest. The new burners were modeled with an added 3% efficiency on the existing boiler. The simulation results are shown below.

ENERGY MODELING OUTPUTS

Burner Replacement Savings

BUILDING	SQFT	MODEL % ELECTRIC SAVINGS	kWh SAVINGS	MODEL % THERM SAVINGS	THERM SAVINGS
Margaret L Vetter Elementary	33,635	-0.2%	(1,093)	3.1%	680

ECM 8 - Premium Efficiency Pump Motors and VFDs

EATONTOWN BOARD OF EDUCATION		Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated ECM included in the project						
ECM	ECM DESCRIPTION					
8	Premium Efficiency Pump Motors and VFDs			✔		

Background & Existing Conditions

Premium efficiency electric motors will help optimize fan and pump efficiency, reduce electrical power consumption and improve system reliability. These motors are designed to run cooler, last longer, and require less maintenance than the existing standard efficiency motors. Premium efficiency motors can be as high as 95% efficient (as opposed to standard efficiency motors of 78% to 88%) and are capable of operating at varying speeds allowing Variable Frequency Drive (VFD) installations where applicable.

Margaret L Vetter Elementary has (4) existing constant speed hot water system pumps. Existing pumps to be replaced with new variable speed pumps with variable frequency drives.

Existing Hot Water Loop Pumps at Vetter Elementary

ECM Calculations

Energy Savings from the installation of variable speed pumps were modeled using eQuest. Pumps were modeled at a minimum speed of 40%. The simulation results are shown below.

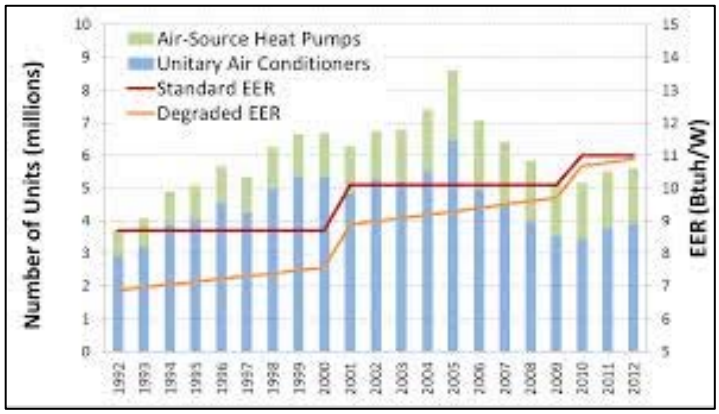
ENERGY MODELING OUTPUTS						
VFD Savings						
BUILDING	MODEL % ELECTRIC SAVINGS	kWh SAVINGS	MODEL % DEMAND SAVINGS	kW SAVINGS	MODEL % THERM SAVINGS	THERM SAVINGS
Margaret L Vetter Elementary	3.4%	20,844	1.5%	5	-2.8%	(613)

ECM 9 - Rooftop Unit Replacement

EATONTOWN BOARD OF EDUCATION	Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated					
ECM included in the project					
ECM	**ECM DESCRIPTION**				
9	Rooftop Unit Replacement	✔	✔	✔	✔	

Background & Existing Conditions

Many commercial buildings are operating with older and inefficient HVAC systems. The average life expectancy of commercial HVAC RTU equipment is 10 to 15 years—which means that many commercial buildings are ready for new natural gas rooftop units. Technology improvements and demand have led to greater energy efficiency and more choices in systems. Installing new, higher efficiency units will provide energy savings as well as deliver enhanced technology and controls of the RTUs when compared to the existing units.



The following Rooftop Units will be replaced with high efficiency units:

RTU Replacement Scope of Work						
BUILDING	SQFT	INSTALL? (Y/N)	Description	Notes	Tons	QUANTITY
Memorial Middle School	58,225	Y	Packaged VAV-RTU: 50-Tons / RTU [M-AC-1]	Classrooms 10-20, FCS, App Tech	50	1
		Y	Packaged VAV-RTU: 50-Tons / RTU [M-AC-2]	Classrooms 1-8, 9A&9B, Art Room, Office Areas	50	1
		Y	Packaged SZ-RTU: 20-Tons / RTU [M-AC-3]	All Purpose Room	20	1
		N	Packaged SZ-RTU: 20-Tons / RTU [M-AC-4A]	Gym	20	1
		N	Packaged SZ-RTU: 20-Tons / RTU [M-AC-4B]	Gym	20	1
		Y	Packaged SZ-RTU: 10-Tons / RTU [M-AC-5]	Media Center	10	1
		Y	Packaged SZ-RTU: 7.5-Tons / RTU [M-AC-6]	Music Rm 140	7.5	1
		N	Packaged SZ-RTU: 3-Tons / RTU [M-AC-7]	21c	3	1
		Y	Packaged SZ-RTU: 7.5-Tons / RTU [M-AC-8]	21A & 21B	7.5	1
		N	Packaged SZ-RTU: 4-Tons / RTU [M-AC-9]	Gym offices & Hallway	4	1
		N	Packaged SZ-RTU: 3-Tons / RTU [AC-1]	Administration Section	3	1
		N	Packaged SZ-RTU: 4-Tons / RTU [AC-2]	Administration Section	4	1
		N	Packaged SZ-RTU: 3-Tons / RTU [AC-3]	Administration Section	3	1
		N				
		N				
		N				
		N				
Meadowbrook Elementary	42,605	Y	Packaged VAV-RTU: 30-Tons / RTU [B-AC-1]	Office Areas & Kindergarten Rooms	30	1
		Y	Packaged VAV-RTU: 35-Tons / RTU [B-AC-2]	Classrooms 12-15,6-11, & Art Room Area	35	1
		Y	Packaged VAV-RTU: 30-Tons / RTU [B-AC-3]	Classrooms 16-18, 19, 30-32	30	1
		N	Packaged SZ-RTU: 30-Tons / RTU [B-AC-4]	Multi- Purpose Room & Stage	30	1
		N				
		N				
		N				
		N				
Margaret L Vetter Elementary	33,635	N	Packaged VAV-RTU: 50-Tons / RTU [V-AC-1]	Classrooms 1-8, Library	50	1
		Y	Packaged VAV-RTU: 50-Tons / RTU [V-AC-2]	Classrooms 9-21, Nurse	50	1
		Y	Packaged SZ-RTU: 20-Tons / RTU [V-AC-3]	Multi- Purpose Room & Stage	20	1
		N				
		N				
		N				
		N				
Woodmere Elementary	44,510	Y	Packaged VAV-RTU: 35-Tons / RTU [W-AC-1]	Classrooms 1-6, Office Areas	35	1
		Y	Packaged VAV-RTU: 35-Tons / RTU [W-AC-2]	Classrooms 7-11	35	1
		N	Packaged VAV-RTU: 27.5-Tons / RTU [W-AC-3]	Classrooms 12-16	27.5	1
		Y	Packaged VAV-RTU: 27.5-Tons / RTU [W-AC-4]	Classrooms 17-20, K-1, K-2	27.5	1
		N	Packaged SZ-RTU: 17.5-Tons / RTU [W-AC-5]	MPR	17.5	1
		N	Packaged SZ-RTU: 17.5-Tons / RTU [W-AC-6]	MPR	17.5	1
		N				
		N				
		N				
		N				

RTU Replacement Scope of Work						
School	New RTU Replacements	Total Existing RTU	% of Total RTU	New Replacement Tons	Total Existing Tons	% of Total Tons
Memorial Middle School	6	13	46.2%	145	202	71.8%
Meadowbrook Elementary	3	4	75.0%	95	125	76.0%
Vetter Elementary	2	3	66.7%	70	120	58.3%
Woodmere Elementary	3	6	50.0%	97.5	160	60.9%
Totals	**14**	26	**53.8%**	**407.5**	607	**67.1%**

Rooftop Unit Replacement scope of work for Eatontown Board of Education includes 14 units across the four schools, equating to 407.5 tons of cooling. Rooftop Units selected for replacement were selected by the Board based off existing conditions and priority.


Existing roof top units at Memorial Middle School and Meadowbrook Elementary


Existing roof top units at Vetter Elementary and Woodmere Elementary

ECM Calculations

Energy Savings from the installation of higher efficiency Packaged Rooftop Units were modeled using eQuest. Gas fired furnace and DX cooling efficiency were increased to comply with the minimum efficiency required for new units in the P4P Guidelines. The simulation results from the higher efficiency units are shown below.

ENERGY MODELING OUTPUTS

RTU Replacement Savings

BUILDING	SQFT	MODEL % ELECTRIC SAVINGS	kWh SAVINGS	MODEL % DEMAND SAVINGS	kW SAVINGS	MODEL % THERM SAVINGS	THERMS SAVINGS
Memorial Middle School	58,225	3.9%	43,719	0.0%	(0.1)	-0.3%	(64)
Meadowbrook Elementary	42,605	5.2%	33,537	0.0%	0.1	0.0%	1
Margaret L Vetter Elementary	33,635	3.3%	19,833	0.1%	0.3	0.3%	66
Woodmere Elementary	44,510	2.8%	26,228	0.0%	0.1	0.0%	0

ECM 10 – Ductwork Renovations

EATONTOWN BOARD OF EDUCATION	Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated ECM included in the project					
ECM	ECM DESCRIPTION				
10	Ductwork Renovations	✔	✔	✔	✔	

Background & Existing Conditions

A ductwork system is a branching network of round or rectangular tubes which are generally constructed of sheet metal, fiberglass board, or a flexible plastic and-wire composite located within walls, floors, and ceilings. This system, depending on the season, distributes heated or cooled air (including ventilation air) from a rooftop unit or air handler to various rooms. This system can make a big difference in both the cost and the effectiveness of heating and cooling a large building. The ductwork system can also have an important effect on health of the occupants through the distribution of indoor air pollution. Ductwork repairs can be a very cost-effective energy conservation measure especially if ductwork is in penthouse or attic spaces.

Duct systems lose energy by conduction of heat from the warm surface, and air leakage through small cracks and seams**.** Ductwork located in attics or penthouse spaces that are nearly as cold as the temperature outside, heat loss through conduction will occur if insulation is in poor condition. Air leakage through supply and return ductwork can occur through accidental holes or poorly connected duct sections. In addition to increased efficiency of the

system, sealing and insulating ducts can help with common comfort problems, such as rooms that are too hot in the summer or too cold in the winter.

The following ductwork improvements will be made across the district:

Ductwork Renovations Scope of Work				
BUILDING	**SQFT**	**CATEGORY**	**Total Tons**	**QUANTITY**
Memorial Middle School	58,225	Ductwork Insulation	202	1
		RTU Outside Air Intake Screen Replacement		1
Meadowbrook Elementary	42,605	Ductwork Insulation	125	1
		RTU Outside Air Intake Screen Replacement		1
Margaret L Vetter Elementary	33,635	Ductwork Insulation	120	1
		RTU Outside Air Intake Screen Replacement		1
Woodmere Elementary	44,510	Ductwork Insulation	160	1
		Exterior Ductwork Insulation		1

Existing ductwork at Memorial Middle School and Vetter Elementary

ECM Calculations

There are no Energy Savings associated with this Energy Conservation Measure.

ECM 11 – Destratification Fans

EATONTOWN BOARD OF EDUCATION		Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✓ ECM was evaluated						
ECM included in the project						
ECM	ECM DESCRIPTION					
11	Destratification Fans	✓	✓	✓	✓	

Background & Existing Conditions

Large indoor spaces with high ceilings such as a gymnasium are prone to a condition called stratification. Stratification is a common property of air to separate due to temperature difference. Typically, a layer of warm air will sit on top of a layer of cold air. The lower cold air causes discomfort for occupants of the space as well as increased energy usage of air handling systems to overcome this condition. Destratification fans provide the turbulence in the space necessary for warm and cold air to mix. The result is a blended comfortable air temperature with less usage of the rooms HVAC systems.


Existing gymnasium at Memorial Middle School and existing multipurpose room at Meadowbrook Elementary


Existing multipurpose rooms at Vetter Elementary and Woodmere Elementary

Destratification fans will be installed in the following spaces across the district:

Destratification Fan Scope of Work			
BUILDING	CATEGORY	NOTES	QUANTITY
Memorial Middle School	Air Pear 25	Gym	4
Meadowbrook Elementary	Air Pear 25	Multi-Purpose Room	4
Margaret L Vetter Elementary	Air Pear 25	Multi-Purpose Room	4
Woodmere Elementary	Air Pear 25	Multi-Purpose Room	4

ECM Calculations

Energy Savings from the installation of Destratification Fans were modeled using eQuest. The thermostat setpoints were adjusted in these spaces based on a floor-to-ceiling temperature difference determined by P4P Guidelines. The equipment load in the space was increased reflected added fan usage. The simulation results from the higher efficiency units are shown below.

Destratification Fan Savings					
BUILDING	SQFT	MODEL % ELECTRIC SAVINGS	kWh SAVINGS	MODEL % THERM SAVINGS	THERM SAVINGS
Memorial Middle School	58,225	0.20%	2,252	4.4%	896
Meadowbrook Elementary	42,605	0.14%	905	5.4%	978
Margaret L Vetter Elementary	33,635	0.15%	892	3.9%	868
Woodmere Elementary	44,510	0.31%	2,904	16.2%	809

ECM 12 – Domestic Water Heater Replacement

EATONTOWN BOARD OF EDUCATION		Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated						
ECM included in the project						
ECM	**ECM DESCRIPTION**					
12	Domestic Water Heater Replacement	✔				

ECM WAS EVALUATED BUT WAS NOT INCLUDED IN THE ESIP PROJECT

Background & Existing Conditions

In a storage (tank) water heater, water is always kept hot and ready for use in insulated storage tanks with capacities ranging from 20 to 140 gallons. Many fuel options are available, including electricity, natural gas, oil, and propane. One drawback of these units is the energy used to keep the water hot at all times, otherwise known as “standby losses.” Condensing gas water heaters are a very promising new entry to the market. A condensing gas water heater works like a normal tank-type water heater, except that before the combustion gases are vented outside, the heat in those gases is captured and used to help heat the water in the tank.

Memorial Middle School has (2) existing domestic hot water heaters. Existing domestic hot water heaters to be replaced with (2) new high efficiency domestic hot water heaters.

Existing Hot Water Heater Tanks at Memorial Middle School

ECM Calculations

Energy Savings from the installation of a Domestic Water Heat Replacement were modeled using eQuest. The simulation results are shown below.

ENERGY MODELING OUTPUTS					
Domestic Hot Water Replacement Savings					
BUILDING	**SQFT**	**MODEL % ELECTRIC SAVINGS**	**kWh SAVINGS**	**MODEL % THERM SAVINGS**	**THERM SAVINGS**
Memorial Middle School	58,225	0.00%	0	0.5%	92

ECM 13 – Solar Power Purchase Agreement

EATONTOWN BOARD OF EDUCATION

✓	ECM was evaluated
	ECM included in the project

ECM	ECM DESCRIPTION	Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
13	Solar PPA	✓	✓	✓	✓	✓

The renewable energy industry is one of the fastest growing and evolving components to modern building system design. The ability to capture solar energy will provide long term economic and environmental benefits. Technology improvements are rapidly evolving as well, and the market is flooded with new products with new features that have only been available within the last few years, with promising new technologies and updates on the verge of becoming available to the market.

Photovoltaic (PV) solar array

Clients have the opportunity to purchase power through a Power Purchase Agreement, predetermining fixed low rates for the duration of the agreement, without having to manage any part of the process. This allows the solar provider to manage compliance reporting, filings, and maintenance of the equipment for the entire length of the contract.

A solar PPA makes going green easy. Work takes place around the client's schedule, and a safe and functional environment is maintained throughout installation of the system.

Assessment

A preliminary assessment of your facilities will allow for the design of a system that meets your energy needs and environmental goals.

Agreement
Power Purchase Agreements allow for the sale of the energy produced on a per kWh basis, while a lease agreement allows the solar provider to access the system they own so that they may monitor and maintain the system for you.

Installation
A turnkey system includes the design, construction, commissioning, and interconnection with local utilities.

Monitoring
The solar provider monitors the PV installation to ensure performance and for ease of billing. The client has the capability to track output and environmental benefits online.

Management
The solar provider handles all compliance and reporting requirements for the client. They will file documentation with federal and state agencies and participate in state and utility REC markets.

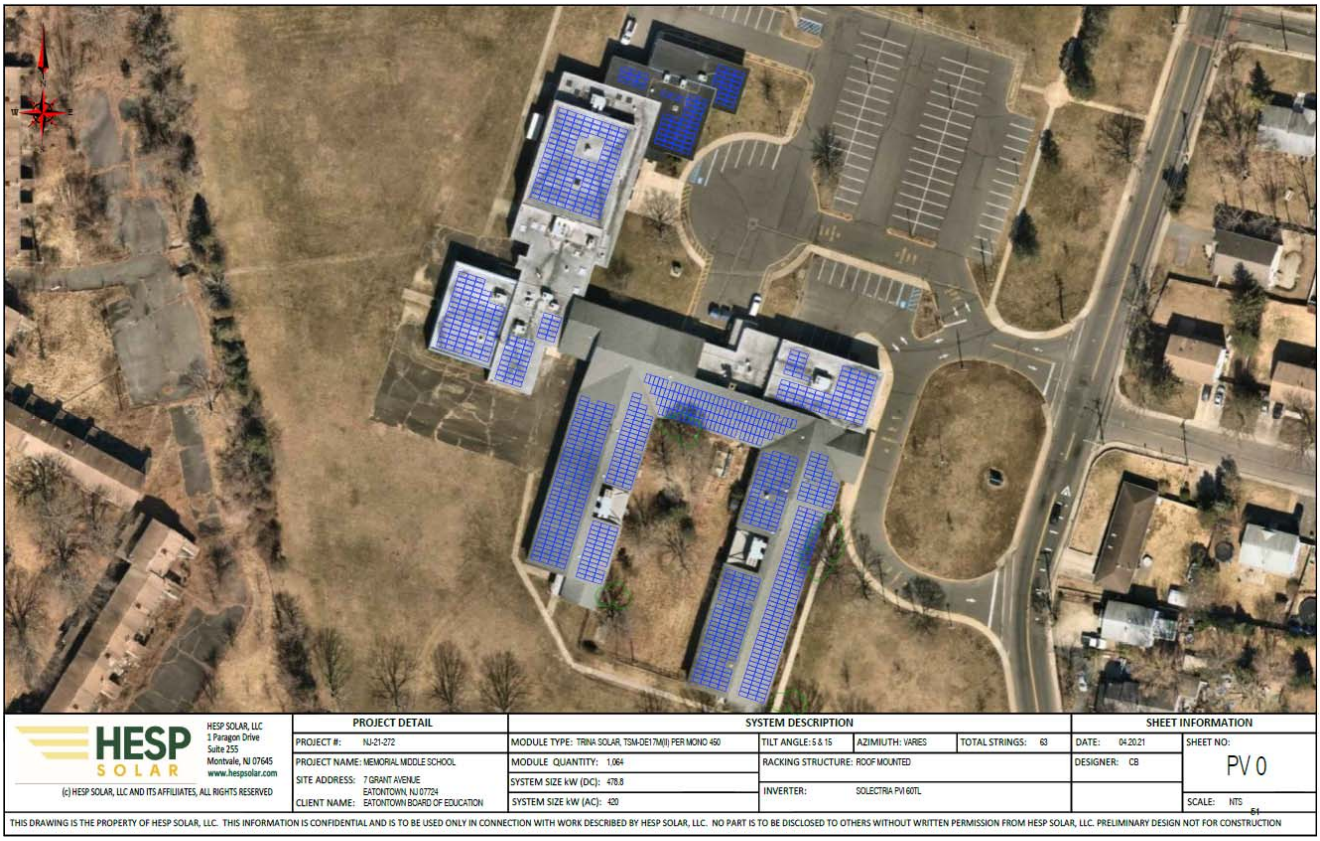
Scope of Work

- Savings estimates are calculated from proposals received during the Eatontown Board of Education Solar PPA RFP process
- Installation of the Solar PV System shall be in accordance with NFPA 70. NEC 2011. ARTICLE 690.Solar Photovoltaic (PV) Systems
- PPA Firm will receive any incentives available

Solar Photovoltaic Arrays

Eatontown Board of Education roof mounted solar opportunities are show below:

Memorial Middle School

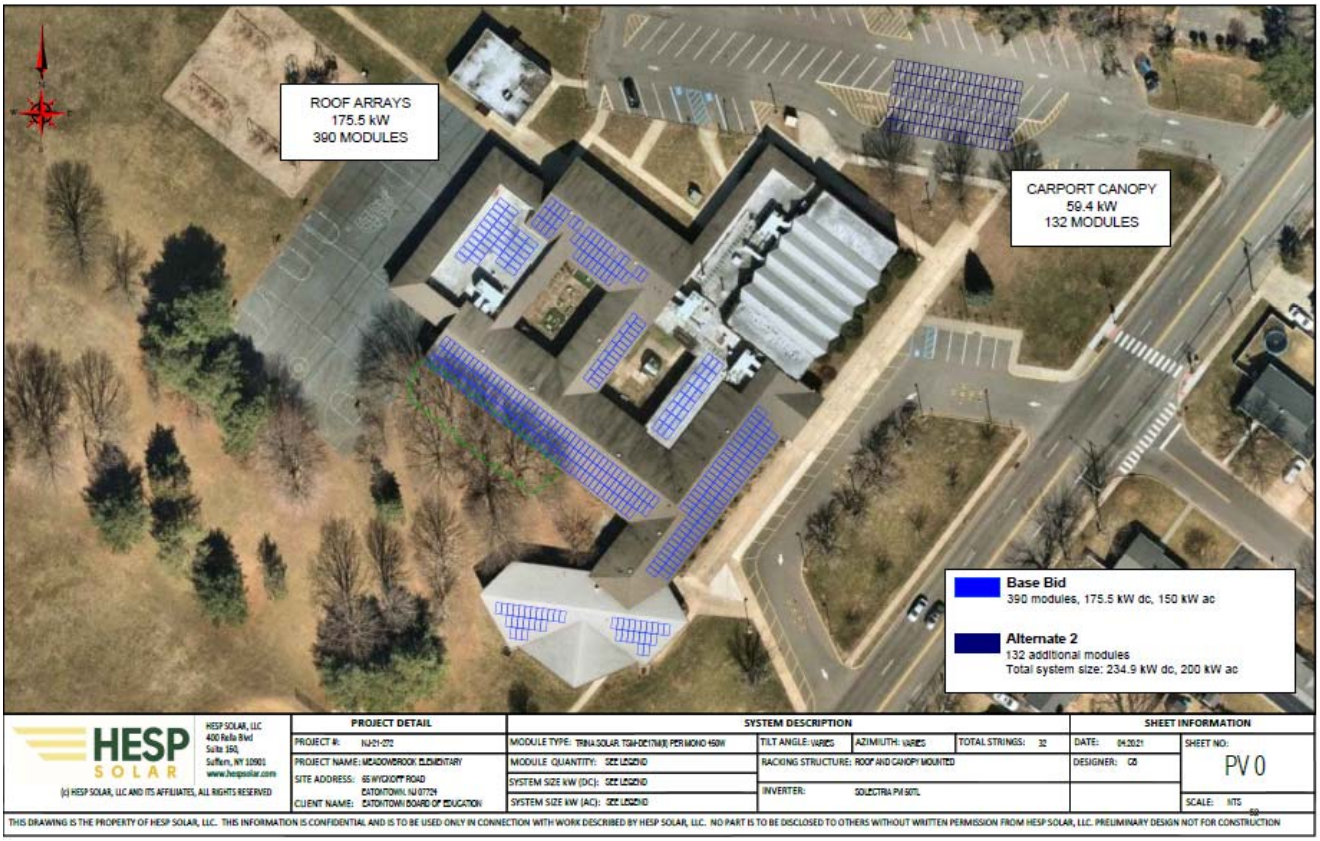


HESP SOLAR

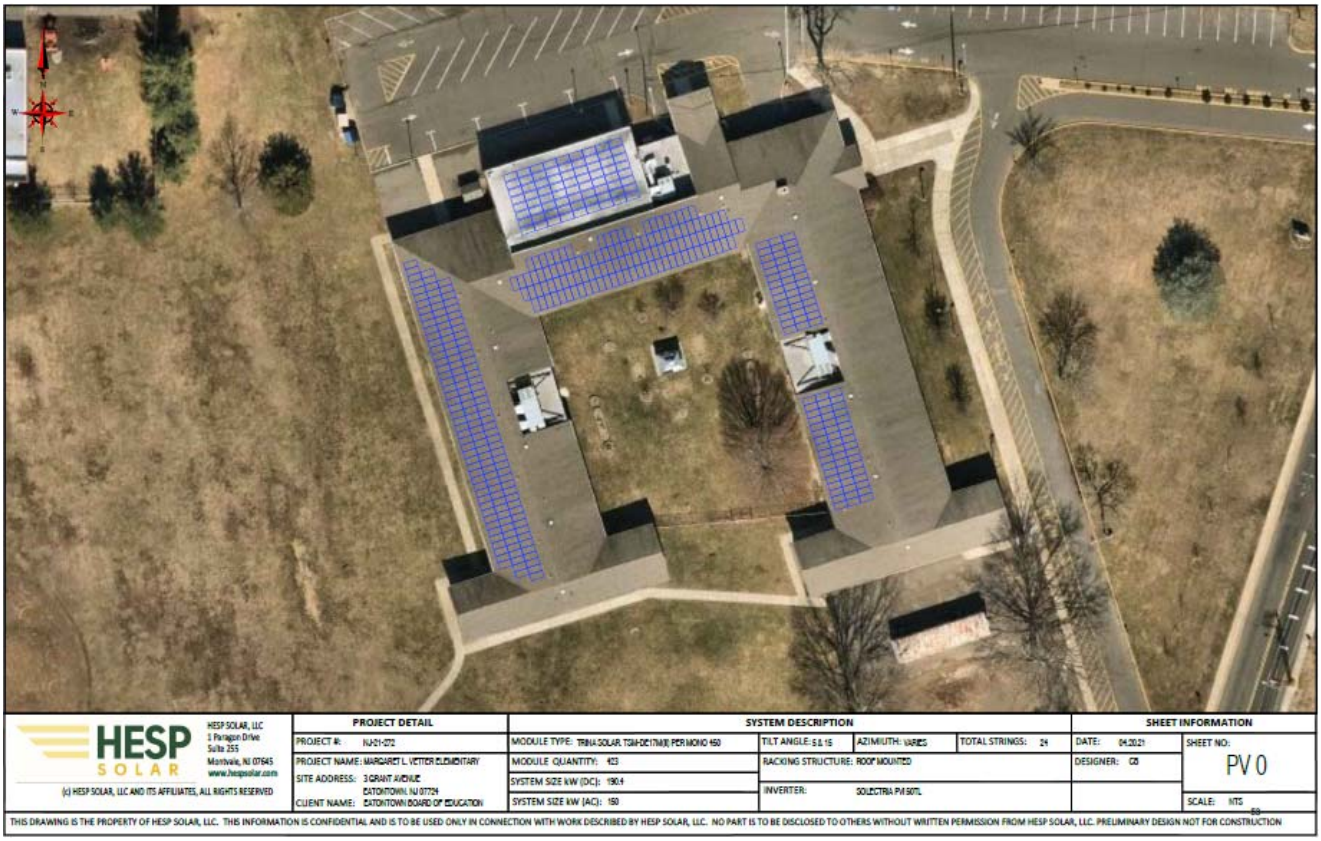
HESP SOLAR, LLC
1 Paragon Drive
Suite 255
Montvale, NJ 07645
www.hespsolar.com

PROJECT DETAIL		SYSTEM DESCRIPTION				SHEET INFORMATION	
PROJECT #:	NJ-21-272	MODULE TYPE: TRINA SOLAR, TSM-DE17M(II) PER MOND 450	TILT ANGLE: 5 & 15	AZIMIUTH: VARIES	TOTAL STRINGS: 63	DATE: 04.20.21	SHEET NO: PV 0
PROJECT NAME:	MEMORIAL MIDDLE SCHOOL	MODULE QUANTITY: 1,064	RACKING STRUCTURE: ROOF MOUNTED			DESIGNER: CB	
SITE ADDRESS:	7 GRANT AVENUE EATONTOWN, NJ 07724	SYSTEM SIZE kW (DC): 478.8	INVERTER: SOLECTRIA PVI 60TL				
CLIENT NAME:	EATONTOWN BOARD OF EDUCATION	SYSTEM SIZE kW (AC): 420					SCALE: NTS

Meadowbrook Elementary



Margaret L Vetter Elementary



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PROJECT DETAIL		SYSTEM DESCRIPTION				SHEET INFORMATION	
PROJECT #:	NJ21-272	MODULE TYPE:	TRINA SOLAR, TSM-DE17M(II) PER MONO 450	TILT ANGLE: 5 & 15	AZIMUTH: VARIES	TOTAL STRINGS: 24	DATE: 04.2021	SHEET NO: PV 0
PROJECT NAME:	MARGARET L VETTER ELEMENTARY	MODULE QUANTITY:	423	RACKING STRUCTURE:	ROOF MOUNTED		DESIGNER: CB	
SITE ADDRESS:	3 GRANT AVENUE EATONTOWN, NJ 07724	SYSTEM SIZE kW (DC):	190.4	INVERTER:	SOLECTRIA PVI 50TL			
CLIENT NAME:	EATONTOWN BOARD OF EDUCATION	SYSTEM SIZE kW (AC):	150					SCALE: NTS

Woodmere Elementary

HESP SOLAR

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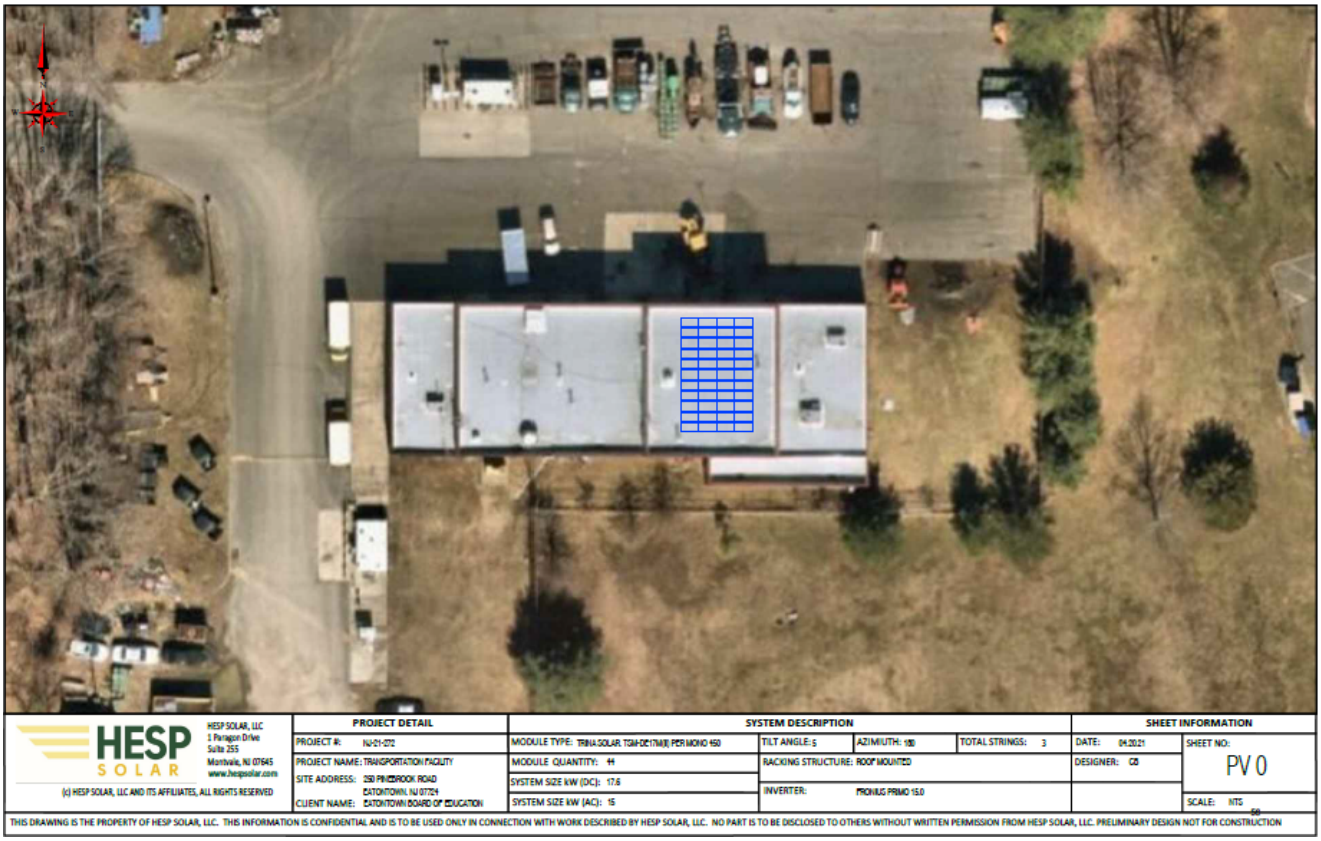
400 Rella Blvd
Suite 360,
Suffern, NY 10901
www.hespsolar.com

PROJECT DETAIL		SYSTEM DESCRIPTION				SHEET INFORMATION	
PROJECT #:	NJ21-272	MODULE TYPE: TRINA SOLAR TSM-DE17M(II) PER MONO 450W	TILT ANGLE: VARIES	AZIMUTH: VARIES	TOTAL STRINGS: 49	DATE: 04.2021	SHEET NO: PV 0
PROJECT NAME:	WOODMERE ELEMENTARY ALTERNATE 1	MODULE QUANTITY: 836	RACKING STRUCTURE: ROOF MOUNTED			DESIGNER: CB	
SITE ADDRESS:	65 RALEIGH COURT EATONTOWN, NJ 07724	SYSTEM SIZE kW (DC): 376.2	INVERTER: SOLECTRIA PVI 60TL				
CLIENT NAME:	EATONTOWN BOARD OF EDUCATION	SYSTEM SIZE kW (AC): 300				SCALE: NTS	

Transportation Facility



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PROJECT DETAIL		SYSTEM DESCRIPTION				SHEET INFORMATION	
PROJECT #:	NJ-21-272	MODULE TYPE:	TRINA SOLAR TSM-DE17M(II) PER MONO 450	TILT ANGLE: 5	AZIMUTH: 180	TOTAL STRINGS: 3	DATE: 04.2021	SHEET NO: PV 0
PROJECT NAME:	TRANSPORTATION FACILITY	MODULE QUANTITY:	44	RACKING STRUCTURE:	ROOF MOUNTED		DESIGNER: CB	
SITE ADDRESS:	150 PINEBROOK ROAD EATONTOWN, NJ 07724	SYSTEM SIZE kW (DC):	17.6	INVERTER:	FRONIUS PRIMO 15.0			
CLIENT NAME:	EATONTOWN BOARD OF EDUCATION	SYSTEM SIZE kW (AC):	15				SCALE: NTS	

ECM Calculations

The energy savings shown below are a result of the reduced electrical cost from the PPA for the kWh generated by the solar panels. Actual rates and solar generation estimates were taken from the proposals received during the Eatontown Board of Education Solar PPA RFP process. A comparison was done to ensure the generated kWh did not exceed the post-project estimated energy consumption. In cases where the generated kWh exceeded the post-project electrical consumption, the generation numbers were reduced to ensure the site would not generate more electric than it consumes. The PPA term is 15 years.

PPA RATE ($/kWh)	ANNUAL ESCALATION RATE	ANNUAL PANEL DERATING	END OF PPA REMOVAL COST
$0.0190	1.00%	0.50%	$0

INSTALLED CAPACITY (kWdc)	REQ'D ROOFING UPGRADES	TOTAL ECM YEAR 1 SAVINGS
1,240.7	$0	$116,976

Solar PPA - Rates & Savings

BUILDING	SQFT	MOUNTING CATEGORY	INSTALLED ARRAY (kWdc)	ANNUAL YIELD RATIO (kWh/kWdc)	INSTALLED kWh GENERATION	$$/kWh RATES		SAVINGS	TOTAL SAVINGS
						UTILITY	NEW PPA		
Memorial Middle School	58,225	Roof	478.8	1,189	569,423	$0.096	$0.0190	$44,000	**$44,000**
Meadowbrook Elementary	42,605	Roof	175.5	1,266	222,267	$0.096	$0.0190	$17,096	**$17,096**
Margaret L Vetter Elementary	33,635	Roof	190.4	1,231	234,327	$0.096	$0.0190	$18,095	**$18,095**
Woodmere Elementary	44,510	Roof	376.2	1,227	461,775	$0.096	$0.0190	$35,630	**$35,630**
Transportation Facility	10,800	Roof	19.8	1,222	24,196	$0.108	$0.0190	$2,154	**$2,154**

YEAR	PPA kWh PRODUCTION	UTILITY SAVINGS	PPA COST	NET SOLAR SAVINGS
1	1,511,987	$145,704	($28,728)	$116,976
2	1,504,428	$148,165	($28,870)	$119,295
3	1,496,905	$150,667	($29,013)	$121,655
4	1,489,421	$153,212	($29,156)	$124,056
5	1,481,974	$155,800	($29,301)	$126,499
6	1,474,564	$158,431	($29,446)	$128,986
7	1,467,191	$161,107	($29,592)	$131,516
8	1,459,855	$163,828	($29,738)	$134,090
9	1,452,556	$166,596	($29,885)	$136,710
10	1,445,293	$169,409	($30,033)	$139,376
11	1,438,067	$172,271	($30,182)	$142,089
12	1,430,876	$175,180	($30,331)	$144,849
13	1,423,722	$178,139	($30,481)	$147,658
14	1,416,603	$181,148	($30,632)	$150,516
15	1,409,520	$184,207	($30,784)	$153,424
Total	21,902,963	2,463,866	($446,173)	$2,017,693

Memorial Middle School							
YEAR	$$/kWh RATES			SOLAR kWh	UTILITY SAVINGS	PPA COST	TOTAL SAVINGS
	UTILITY	SOLAR PPA	MAINT.				
1	$0.096	$0.0190	$0	569,423	$54,819	($10,819)	$44,000
2	$0.098	$0.0192	$0	566,576	$55,745	($10,873)	$44,873
3	$0.101	$0.0194	$0	563,743	$56,687	($10,926)	$45,760
4	$0.103	$0.0196	$0	560,924	$57,644	($10,980)	$46,664
5	$0.105	$0.0198	$0	558,119	$58,618	($11,035)	$47,583
6	$0.107	$0.0200	$0	555,329	$59,608	($11,089)	$48,518
7	$0.110	$0.0202	$0	552,552	$60,615	($11,144)	$49,470
8	$0.112	$0.0204	$0	549,789	$61,638	($11,200)	$50,439
9	$0.115	$0.0206	$0	547,040	$62,680	($11,255)	$51,425
10	$0.117	$0.0208	$0	544,305	$63,738	($11,311)	$52,428
11	$0.120	$0.0210	$0	541,584	$64,815	($11,367)	$53,448
12	$0.122	$0.0212	$0	538,876	$65,909	($11,423)	$54,487
13	$0.125	$0.0214	$0	536,181	$67,023	($11,479)	$55,543
14	$0.128	$0.0216	$0	533,500	$68,155	($11,536)	$56,618
15	$0.131	$0.0218	$0	530,833	$69,306	($11,593)	$57,712
Total				8,248,774	$927,000	-$168,031	$758,969

Meadowbrook Elementary							
YEAR	$$/kWh RATES			SOLAR kWh	UTILITY SAVINGS	PPA COST	TOTAL SAVINGS
	UTILITY	SOLAR PPA	MAINT.				
1	$0.096	$0.0190	$0	222,267	$21,319	($4,223)	$17,096
2	$0.098	$0.0192	$0	221,156	$21,679	($4,244)	$17,435
3	$0.100	$0.0194	$0	220,050	$22,046	($4,265)	$17,781
4	$0.10	$0.0196	$0	218,950	$22,418	($4,286)	$18,132
5	$0.105	$0.0198	$0	217,855	$22,797	($4,307)	$18,489
6	$0.107	$0.0200	$0	216,766	$23,182	($4,329)	$18,853
7	$0.109	$0.0202	$0	215,682	$23,573	($4,350)	$19,223
8	$0.112	$0.0204	$0	214,603	$23,971	($4,372)	$19,600
9	$0.114	$0.0206	$0	213,530	$24,376	($4,393)	$19,983
10	$0.117	$0.0208	$0	212,463	$24,788	($4,415)	$20,373
11	$0.119	$0.0210	$0	211,400	$25,207	($4,437)	$20,770
12	$0.122	$0.0212	$0	210,343	$25,632	($4,459)	$21,173
13	$0.125	$0.0214	$0	209,292	$26,065	($4,481)	$21,584
14	$0.127	$0.0216	$0	208,245	$26,505	($4,503)	$22,002
15	$0.130	$0.0218	$0	207,204	$26,953	($4,525)	$22,428
Total				3,219,805	$360,511	-$65,589	$294,923

Margaret L Vetter Elementary							
YEAR	$$/kWh RATES			SOLAR kWh	UTILITY SAVINGS	PPA COST	SAVINGS
	UTILITY	SOLAR PPA	MAINT.				
1	$0.096	$0.0190	$0.0000	234,327	$22,548	($4,452)	$18,095
2	$0.098	$0.0192	$0.0000	233,156	$22,928	($4,474)	$18,454
3	$0.101	$0.0194	$0.0000	231,990	$23,316	($4,496)	$18,819
4	$0.103	$0.0196	$0.0000	230,830	$23,710	($4,519)	$19,191
5	$0.105	$0.0198	$0.0000	229,676	$24,110	($4,541)	$19,569
6	$0.107	$0.0200	$0.0000	228,527	$24,517	($4,564)	$19,954
7	$0.110	$0.0202	$0.0000	227,385	$24,931	($4,586)	$20,345
8	$0.112	$0.0204	$0.0000	226,248	$25,352	($4,609)	$20,744
9	$0.115	$0.0206	$0.0000	225,117	$25,781	($4,632)	$21,149
10	$0.117	$0.0208	$0.0000	223,991	$26,216	($4,655)	$21,561
11	$0.120	$0.0210	$0.0000	222,871	$26,659	($4,678)	$21,981
12	$0.122	$0.0212	$0.0000	221,757	$27,109	($4,701)	$22,408
13	$0.125	$0.0214	$0.0000	220,648	$27,567	($4,724)	$22,843
14	$0.128	$0.0216	$0.0000	219,545	$28,033	($4,747)	$23,285
15	$0.130	$0.0218	$0.0000	218,447	$28,506	($4,771)	$23,735
Total				3,394,515	$381,282	-$69,148	$312,135

Woodmere Elementary							
YEAR	$$/kWh RATES			SOLAR kWh	UTILITY SAVINGS	PPA COST	SAVINGS
	UTILITY	SOLAR PPA	MAINT.				
1	$0.096	$0.0190	$0	461,775	$44,404	($8,774)	$35,630
2	$0.098	$0.0192	$0	459,466	$45,154	($8,817)	$36,337
3	$0.100	$0.0194	$0	457,169	$45,917	($8,861)	$37,056
4	$0.103	$0.0196	$0	454,883	$46,692	($8,905)	$37,788
5	$0.105	$0.0198	$0	452,608	$47,481	($8,949)	$38,532
6	$0.107	$0.0200	$0	450,345	$48,283	($8,993)	$39,290
7	$0.110	$0.0202	$0	448,093	$49,098	($9,038)	$40,061
8	$0.112	$0.0204	$0	445,853	$49,928	($9,082)	$40,845
9	$0.114	$0.0206	$0	443,624	$50,771	($9,127)	$41,644
10	$0.117	$0.0208	$0	441,406	$51,628	($9,172)	$42,456
11	$0.120	$0.0210	$0	439,199	$52,500	($9,218)	$43,283
12	$0.122	$0.0212	$0	437,003	$53,387	($9,263)	$44,124
13	$0.125	$0.0214	$0	434,818	$54,289	($9,309)	$44,979
14	$0.128	$0.0216	$0	432,644	$55,206	($9,355)	$45,850
15	$0.130	$0.0218	$0	430,480	$56,138	($9,402)	$46,736
Total				6,689,364	$750,876	-$136,265	$614,610

Transportation Facility							
YEAR	$$/kWh RATES			SOLAR kWh	UTILITY SAVINGS	PPA COST	SAVINGS
	UTILITY	SOLAR PPA	MAINT.				
1	$0.108	$0.0190	$0	24,196	$2,614	($460)	$2,154
2	$0.110	$0.0192	$0	24,075	$2,658	($462)	$2,196
3	$0.113	$0.0194	$0	23,954	$2,703	($464)	$2,238
4	$0.115	$0.0196	$0	23,835	$2,748	($467)	$2,282
5	$0.118	$0.0198	$0	23,715	$2,795	($469)	$2,326
6	$0.120	$0.0200	$0	23,597	$2,842	($471)	$2,371
7	$0.123	$0.0202	$0	23,479	$2,890	($474)	$2,416
8	$0.126	$0.0204	$0	23,362	$2,939	($476)	$2,463
9	$0.129	$0.0206	$0	23,245	$2,988	($478)	$2,510
10	$0.131	$0.0208	$0	23,129	$3,039	($481)	$2,558
11	$0.134	$0.0210	$0	23,013	$3,090	($483)	$2,607
12	$0.137	$0.0212	$0	22,898	$3,142	($485)	$2,657
13	$0.140	$0.0214	$0	22,783	$3,195	($488)	$2,708
14	$0.143	$0.0216	$0	22,669	$3,249	($490)	$2,759
15	$0.146	$0.0218	$0	22,556	$3,304	($493)	$2,812
Total				350,505	$44,197	-$7,140	$37,057

ECM 14 – Combined Heat & Power

EATONTOWN BOARD OF EDUCATION	Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated					
ECM included in the project					
ECM / **ECM DESCRIPTION**					
14 — Combined Heat & Power Unit	✔				

Background & Existing Conditions

CHP offers energy and environmental benefits over electric-only and thermal-only systems in both central and distributed power generation applications. CHP systems have the potential for a wide range of applications and the higher efficiencies result in lower emissions than separate heat and power generation.

The simultaneous production of useful thermal and electrical energy in CHP systems lead to increased fuel efficiency. CHP units can be strategically located at the point of energy use. Such onsite generation avoids the transmission and distribution losses associated with electricity purchased via the grid from central stations. CHP is versatile and can be coupled with existing and planned technologies for many different applications in the industrial, commercial, and residential sectors.

The CHP will act as supplemental heating for the hot water boiler plant and domestic hot water loop. The CHPs will shut off when there isn't adequate heating load for combined heating and power. If necessary, heat can be rejected through a radiator when the full heating load is not required.

ECM Calculations

Assumptions		
% Maintenance downtime	1.0%	
Downtime for maintenance	87.6	hrs spread throughout year

CHP Input Data		
Electrical output	35	kW
Thermal output	204,040	BTU/hr
Gas input (HHV)	407,144	Btu/hr
Overall efficiency	79.4%	

Runtime Analysis	
Run hours	3,114
% Boiler load displaced by CHP	94.9%

		Fuel Usage Without CHP			
Month	Days	Total Gas - Post ECMs	Proposed Boiler Efficiency	Non-Displaceable Gas Therms	Displaceable Gas Therms
Jan	31	3,501	74%	2,324	1,177
Feb	28	2,865	73%	1,868	997
Mar	31	2,350	70%	1,482	868
Apr	30	1,258	66%	894	364
May	31	313	0%	313	0
Jun	30	190	0%	190	0
Jul	31	160	0%	160	0
Aug	31	107	0%	107	0
Sep	30	168	0%	168	0
Oct	31	544	53%	375	169
Nov	30	1,695	64%	1,048	647
Dec	31	2,811	72%	1,805	1,006
Total:	365	15,962		10,735	5,228

		35 kW Cogen Plant Thermal Operation							
Month	Days	Combined Cogen Run Hours	Max Daily Run Hours w/ Heat Dump	Cogen Dump Hours	Total Cogen Hours w/ Heat Dump	Utilized Cogen Heat Therms	Avoided Boiler Gas Therms	Full Load Run Hours	System Operating Efficiency
Jan	31	737	23.8	0	737	861	1,163	737	71%
Feb	28	665	23.8	0	665	717	981	665	70%
Mar	31	737	23.8	0	737	570	818	737	67%
Apr	30	713	23.8	0	713	222	336	713	64%
May	31	737	23.8	0	737	0	0	737	0%
Jun	30	713	23.8	0	713	0	0	713	0%
Jul	31	737	23.8	0	737	0	0	737	0%
Aug	31	737	23.8	0	737	0	0	737	0%
Sep	30	713	23.8	0	713	0	0	713	0%
Oct	31	737	23.8	0	737	78	148	737	52%
Nov	30	713	23.8	0	713	339	526	713	63%
Dec	31	737	23.8	0	737	700	975	737	69%
Total:	365	8,672		0	8,672	3,488	4,947	8,672	67%

		Fuel Usage With CHP			Electric Savings With CHP			
Month	Days	Supplemental Boiler Gas Therms	Cogen Gas Therms	Total Gas	Run Hours	Equivalent Full Load Run Hours	kW Demand Savings	Cogen Electric Generation kWh
Jan	31	14	2,018	4,356	671	473	35.00	16,542
Feb	28	15	1,711	3,595	587	398	35.00	13,945
Mar	31	50	1,442	2,974	528	330	35.00	11,550
Apr	30	28	605	1,527	232	137	35.00	4,803
May	31	0	0	313	0	0	0.00	0
Jun	30	0	0	190	0	0	0.00	0
Jul	31	0	0	160	0	0	0.00	0
Aug	31	0	0	107	0	0	0.00	0
Sep	30	0	0	168	0	0	0.00	0
Oct	31	21	308	704	129	68	35.00	2,363
Nov	30	121	934	2,103	363	210	35.00	7,346
Dec	31	31	1,708	3,545	604	395	35.00	13,815
Total:	365	280	8,727	19,742	3,114	2,010	20.42	70,365

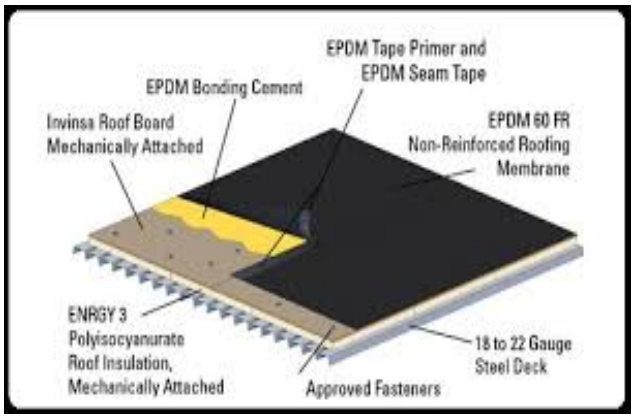
ECM 15 – Roof Refurbishment

EATONTOWN BOARD OF EDUCATION	Memorial Middle School	Meadowbrook Elementary	Margaret L Vetter Elementary	Woodmere Elementary	Transportation Facility
✔ ECM was evaluated					
ECM included in the project					
ECM	ECM DESCRIPTION				
15	Roof Refurbishment	✔	✔	✔	✔	✔

ECM WAS EVALUATED BUT WAS NOT INCLUDED IN THE ESIP PROJECT

Background & Existing Conditions

EPDM is a synthetic rubber that covers the entirety of your roof, forming a durable membrane that keeps the elements on the outside where they belong. However, while there is no questioning its strength, you don't have to worry that an EPDM roofing system is going to add a dangerous amount of weight onto your structure. EPDM generally weighs about 1/3 a pound per square foot. Just about any building out there is a candidate for EPDM, thanks to how lightweight it is.



Scope of Work

Roof repairs are being evaluated in the ESIP project only where the existing roof systems do not have 15 years of warranty remaining and are being targeted for Solar PPA installation. By not including the roof repairs in the Solar PPA, the district will be assured the lowest possible PPA Rate. See the following chart for the roofing scope of work.

Roof Replacement Scope of Work				
BUILDING	REPLACE? (Y/N)	Category	NOTES	QUANTITY (SF)
Memorial Middle School	Y	All Roof Sections	Restoration	58,225
Meadowbrook Elementary	Y	All Roof Sections	Restoration	42,605
Margaret L Vetter Elementary	Y	All Roof Sections	Restoration	33,635
Woodmere Elementary	Y	All Roof Sections	Restoration	44,510
Transportation Facility	Y	All Roof Sections	Restoration	10,800

ECM Calculations

Energy savings from roof restoration were modeled using eQuest for the four schools. Wet insulation will be replaced as part of the roofing restoration. The roof R value was increased by 5 in the eQuest models to account for the new insulation. The entire roof was modeled with this improved R value. The savings below only account for the percentage of roof being replaced.

ENERGY MODELING OUTPUTS								
Roof Restoration Savings								
BUILDING	SQFT	MODEL % ELECTRIC SAVINGS	% ROOF AREA REPLACED	kWh SAVINGS	MODEL % DEMAND SAVINGS	kW SAVINGS	MODEL % THERM SAVINGS	THERM SAVINGS
Memorial Middle School	58,225	1.8%	100%	20,086	1.6%	5	4.1%	843
Meadowbrook Elementary	42,605	2.4%	100%	15,612	2.8%	8	3.4%	620
Margaret L Vetter Elementary	33,635	-0.2%	100%	(1,513)	2.2%	7	3.6%	789
Woodmere Elementary	44,510	2.1%	100%	19,211	1.1%	5	5.4%	268

CALCULATED SAVINGS							
Roof Refurbishment Savings							
BUILDING	SQFT	ROOF SQFT	R VALUE (BEFORE)	U VALUE (BEFORE)	R VALUE (AFTER)	U VALUE (AFTER)	ANNUAL HEATING DEGREE DAYS
Transportation Facility	10,800	10,800	15	0.067	25	0.040	2,783

Roof Refurbishment Savings								
AVERAGE ANNUAL HEATING DELTA T	Q BEFORE (BTUH)	Q AFTER (BTUH)	BTUH SAVINGS	ANNUAL HEATING SAVINGS (BTU)	GAS HEATING EFFICIENCY (%AFUE)	TOTAL HEATING SAVINGS (Therms)	ANNUAL COOLING DEGREE DAYS	AVERAGE ANNUAL COOLING DELTA T
12.6	9,090	5,454	3,636	31,850,496	80%	398	893	9.4

Roof Refurbishment Savings								
Q BEFORE (BTUH)	Q AFTER (BTUH)	BTUH COOLING SAVINGS	ANNUAL COOLING SAVINGS (BTU)	COOLING EFFICIENCY (EER - BTU/Wh)	COOLING SAVINGS (kWh)	HOURS	TOTAL ELECTRIC SAVINGS (kWh)	TOTAL GAS SAVINGS (THERMS)
6,802	4,081	2,721	23,832,576	11.5	2,072	8,760	2,072	398

$$q_{bd} = U \times A \times \Delta t_{bd} \text{ (Btu/h)}$$

ENERGY SAVINGS PLAN

SECTION 4 – FINANCIAL ANALYSIS

Form V – ESCO Construction and Service Fees

FORM V

ESCO's ENERGY SAVINGS PLAN (ESP):
ESCOs PROPOSED FINAL PROJECT COST FORM
EATONTOWN BOARD OF EDUCATION
ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: DCO Energy
PROPOSED CONSTRUCTION FEES:

Fee Category	Fees [1] Dollar ($) Value	Percentage of Hard Costs
Estimated Value of Hard Costs [2]	$ 3,488,124	
ECM Contingency	$ 210,639	
Total Value of Hard Costs	$ 3,698,763	
Project Service Fees		
Investment Grade Energy Audit	$ 46,235	1.25%
Design Engineering Fees	$ -	0.00%
Construction Management & Project Administration	$ 235,611	6.37%
System Commissioning	$ 36,988	1.00%
Equipment Initial Training Fees	$ 11,096	0.30%
ESCO Overhead	$ 110,963	3.00%
ESCO Profit	$ 147,951	4.00%
ESCO Termination Fee	$ 0	0.00%
Project Service Fees Sub Total	$ 329,930	8.92%
TOTAL FINANCED PROJECT COSTS:	$ 4,287,606	15.92%

PROPOSED ANNUAL SERVICE FEES

First Year Annual Service Fees	Fees [1] Dollar ($) Value	Percentage of Hard Costs
SAVINGS GUARANTEE *(OPTION)*	$0	0.00%
Measurement & Verification *(Associated w/ Savings Guarantee Option)*	$14,055	0.38%
ENERGY STAR Services *(optional)*	$0	0.00%
Post Construction Services *(if applicable)*	$0	0.00%
Performance Monitoring	w/ M&V	0.00%
On-going Training Services	w/ M&V	0.00%
Verification Reports	w/ M&V	0.00%
TOTAL FIRST YEAR ANNUAL SERVICES	$0	0.00%

NOTES:
(1) Fees should include all mark-ups, overhead, and profit. Figures stated as a range will NOT be accepted.
(2) The total value of Hard Costs is defined in accordance with standard AIA definitions that include: Labor Costs, Subcontractor Costs, Cost of Materials and Equipment, Temporary Facilities and Related Items, and Miscellaneous Costs such as Permits, Bonds Taxes, Insurance, Mark-ups, Overhead and Profit, etc.

ESCO's proposed interest rate at the time of submission: 5% TO BE USED BY ALL RESPONDING ESCOs FOR PROPOSAL

Form VI – Project Cash Flow Analysis

FORM VI

ESCO's ENERGY SAVINGS PLAN (ESP):
ESCO's ANNUAL CASH FLOW ANALYSIS FORM
EATONTOWN BOARD OF EDUCATION - ENERGY SAVING IMPROVEMENT PROGRAM

ESCO Name: DCO Energy

Note: Respondents must use the following assumptions in all financial calculations:
(a) The cost of all types of energy should be assumed to inflate at **2.4% gas, 2.2%** electric per year and
1. Term of Agreement: 20 years
2. Construction Period [2] (months): 12 Months
3. Cash Flow Analysis Format:

Additional Fees	
Cost of Issuance	$125,000
3rd Party Review	$0
SSP	$334,395
Total	$459,395

Project Cost[1]: **$4,287,606**
Direct Install Incentive Payment: **$0**
Additional Fees: **$459,395**
Financed Amount: **$4,747,001**

Interest Rate: **2.25%**

Year	Annual Energy Savings	Solar PPA Savings	Annual Operational Savings	Energy Rebates / Incentives	Total Annual Savings	Annual Project Costs	Board Costs	Annual Service Costs[3]	Net Cash-Flow to Client	Cumulative Cash Flow
Installation										
Year 1	$ 142,294	$ 116,976	$ 13,650	$ 154,820	$ 427,740	$ (425,340)			$ 2,400	$ 2,400
Year 2	$ 145,444	$ 119,295	$ 13,650	$ 154,172	$ 432,560	$ (430,160)			$ 2,400	$ 4,800
Year 3	$ 148,663	$ 121,655	$ 1,190	$ -	$ 271,507	$ (269,107)			$ 2,400	$ 7,200
Year 4	$ 151,954	$ 124,056	$ 1,190	$ -	$ 277,199	$ (274,799)			$ 2,400	$ 9,600
Year 5	$ 155,317	$ 126,499	$ 1,190		$ 283,006	$ (280,606)			$ 2,400	$ 12,000
Year 6	$ 158,755	$ 128,986			$ 287,741	$ (285,341)			$ 2,400	$ 14,400
Year 7	$ 162,269	$ 131,516			$ 293,785	$ (291,385)			$ 2,400	$ 16,800
Year 8	$ 165,861	$ 134,090			$ 299,951	$ (297,551)			$ 2,400	$ 19,200
Year 9	$ 169,532	$ 136,710			$ 306,243	$ (303,843)			$ 2,400	$ 21,600
Year 10	$ 173,285	$ 139,376			$ 312,661	$ (310,261)			$ 2,400	$ 24,000
Year 11	$ 177,121	$ 142,089			$ 319,210	$ (316,810)			$ 2,400	$ 26,400
Year 12	$ 181,042	$ 144,849			$ 325,891	$ (323,491)			$ 2,400	$ 28,800
Year 13	$ 185,049	$ 147,658			$ 332,707	$ (330,307)			$ 2,400	$ 31,200
Year 14	$ 189,146	$ 150,516			$ 339,661	$ (337,261)			$ 2,400	$ 33,600
Year 15	$ 193,333	$ 153,424			$ 346,756	$ (344,356)			$ 2,400	$ 36,000
Year 16	$ 197,613	$ -			$ 197,613	$ (195,213)			$ 2,400	$ 38,400
Year 17	$ 201,987	$ -			$ 201,987	$ (199,587)			$ 2,400	$ 40,800
Year 18	$ 206,459	$ -			$ 206,459	$ (204,059)			$ 2,400	$ 43,200
Year 19	$ 211,030	$ -			$ 211,030	$ (208,630)			$ 2,400	$ 45,600
Year 20	$ 215,702	$ -			$ 215,702	$ (213,302)			$ 2,400	$ 48,000
Totals	$ 3,531,855	$ 2,017,693	$ 30,869	$ 308,992	$ 5,889,409	$ (5,841,409)	$ -	$ -	$ 48,000	

NOTES:
(1) Includes: Hard costs and project service fees defined in ESCO's PROPOSED "FORM V"
(2) No payments are made by Eatontown Board of Education during the construction period.
(3) This figure should equal the value indicated on the ESCO's PROPOSED "FORM V". DO NOT include in the Financed Project Cost.

Utility Inflation Details

Per Form VI, the annual inflation rate for electric is 2.2%, natural gas and fuel oil is 2.4% and 1.0% for solar per PPA bid results.

Utility Inflation Worksheet					
Year	TOTAL ANNUAL ELECTRIC COST SAVINGS (INCLUDING SOLAR PPA SAVINGS)	NET ANNUAL ELECTRIC COST SAVINGS (EXCLUDING SOLAR PPA SAVINGS)	ANNUAL NATURAL GAS COST SAVINGS	Net Solar Savings	Total
2	$283,852.50	$135,687.55	$9,756.16	$119,294.98	$264,738.69
3	$289,340.13	$138,672.68	$9,990.30	$121,654.58	$270,317.57
4	$294,935.70	$141,723.48	$10,230.07	$124,055.74	$276,009.29
5	$300,641.38	$144,841.39	$10,475.59	$126,499.17	$281,816.16
6	$306,459.35	$148,027.90	$10,727.01	$128,985.59	$287,740.51
7	$312,391.87	$151,284.52	$10,984.46	$131,515.74	$293,784.72
8	$318,441.23	$154,612.78	$11,248.08	$134,090.37	$299,951.23
9	$324,609.77	$158,014.26	$11,518.04	$136,710.23	$306,242.52
10	$330,899.89	$161,490.57	$11,794.47	$139,376.09	$312,661.14
11	$337,314.00	$165,043.37	$12,077.54	$142,088.75	$319,209.66
12	$343,854.61	$168,674.32	$12,367.40	$144,849.00	$325,890.72
13	$350,524.24	$172,385.15	$12,664.22	$147,657.66	$332,707.03
14	$357,325.48	$176,177.63	$12,968.16	$150,515.55	$339,661.33
15	$364,260.98	$180,053.54	$13,279.39	$153,423.50	$346,756.43
16	$184,014.71	$184,014.71	$13,598.10	$0.00	$197,612.81
17	$188,063.04	$188,063.04	$13,924.45	$0.00	$201,987.49
18	$192,200.42	$192,200.42	$14,258.64	$0.00	$206,459.06
19	$196,428.83	$196,428.83	$14,600.85	$0.00	$211,029.68
20	$200,750.27	$200,750.27	$14,951.27	$0.00	$215,701.53

ENERGY SAVINGS PLAN

SECTION 5 – RISK, DESIGN, & COMPLIANCE

Assessment of Risks, Design & Compliance Issues

Moving from a conceptual design to engineered documents DCO has identified areas of the project that could change during the detailed design. The table below represents potential conceptual areas of concern that will need to be investigated further with a corresponding party responsible for the compliance of each item.

Issue	Category	Responsible Party
Alteration of expected Maintenance and Operational Savings	Risk	Eatontown Board of Education
Disposition of Abandoned Equipment (Steam Piping, Condensate Piping, Oil Tanks, etc.)	Risk	Eatontown Board of Education
New Natural Gas Distribution	Risk	Eatontown Board of Education
Integrity of re-used Infrastructure	Risk	Eatontown Board of Education
Life Safety System Coordination	Risk	Eatontown Board of Education
Coordination with Eatontown Board of Education Information Technology Department	Risk	Eatontown Board of Education
Ventilation Compliance with Code	Compliance	Consulting Engineer
Temperature, Humidity and Air Change Compliance with Code	Compliance	Consulting Engineer
Boiler Capacity and Turndown	Design	Consulting Engineer
Natural Gas Regulator Compliance with Code	Compliance	Consulting Engineer
Undocumented Underground Utilities	Risk	Consulting Engineer
Code Compliance of Existing Electrical Infrastructure	Compliance	Consulting Engineer
Lighting Levels	Compliance	Consulting Engineer

Design Light Consortium rating for bulbs	Compliance	Consulting Engineer
Underwriters Laboratory Testing for retrofitted LED Lighting Systems	Compliance	Consulting Engineer
Lighting Retrofits within hard ceilings for fixtures and occupancy sensors	Risk	Consulting Engineer
Street/Parking Lot Pole Structural Integrity	Risk	Consulting Engineer
Unrealized Energy Savings 1. Energy Modeling 2. Performance Monitoring 3. Capacity of Equipment 4. Efficiency of Equipment 5. Run Hours of Equipment	Risk	DCO/ Consulting Engineer 1. DCO 2. DCO 3. Consulting Engineer / Basis of Design Vendor 4. Consulting Engineer / Basis of Design Vendor 5. Eatontown Board of Education
Existing Plumbing Infrastructure with New Low Flow Devices	Design	Consulting Engineer
Adaptation to New RTUs (Curb, Electric, Ductwork, Condensate)	Design	Consulting Engineer / Basis of Design Manufacture
Structural Loads for Rooftop Equipment Replacement	Design	Consulting Engineer
Transformer Loading	Risk	Consulting Engineer
Site Work for Equipment	Design	Consulting Engineer
Condition of Roof Under Units	Risk	Consulting Engineer
Adequate Crane Lifts & Clearances	Design	Consulting Engineer / Rigger
Physical Space Constraints and Clearance for Equipment Replacement	Design	Consulting Engineer

Refrigerant Reclaim / Refrigerant Disposal	Compliance	Contractor
Existing Tie in Locations	Design	Consulting Engineer
Schedule Oversight	Risk	DCO Energy
Impact of Boiler Flue	Design	Consulting Engineer
Impact of Space Usage During Construction	Risk	Consulting Engineer & Eatontown Board of Education
Scope changes relating to requests by Authorities Having Jurisdiction.	Risk	Eatontown Board of Education (via contingency)
Department of Environmental Protection Permitting	Risk	Consulting Engineer
Modifications of Energy Saving Control Sequences and Setpoints impacting Energy Savings and Incentives	Risk	Eatontown Board of Education
Post Construction Calibration of Sensors, Meters, & Safety Devices	Risk	Eatontown Board of Education
Adequate time and access for bidding contractor site surveys	Risk	Eatontown Board of Education
Utility Interconnection approval for the CHP Unit	Risk	Eatontown Board of Education

Measurement & Verification (M&V) Plan

Our approach to M&V of energy savings aligns with the International Performance Measurement & Verification Protocol. More detailed information may be found a. It's most cost-effective to perform M&V using the least costly option that still adequately documents system performance and permits analysis of savings. This approach lowers the total cost of the program leaving more dollars available to perform more facility improvements. Depending upon which ECMs are implemented by Eatontown Board of Education, the M&V plan proposed by DCO would incorporate one or more of the following options which outlines the four most common approaches for M&V:

Option A – Retrofit Isolation with Key Parameter Measurement	This option is based on a combination of measured and estimated factors when variations in factors are not expected. Measurements are spot or short-term and are taken at the component or system level, both in the baseline and post-installation cases. Measurements should include the key performance parameter(s) which define the energy use of the ECM. Estimated factors are supported by historical or manufacturer's data. Savings are determined by means of engineering calculations of baseline and post-installation energy use based on measured and estimated values.	Direct measurements and estimated values, engineering calculations and/or component or system models often developed through regression analysis. Adjustments to models are not typically required.
Option B – Retrofit Isolation with Parameter Measurement	This option is based on periodic or continuous measurements of energy use taken at the component or system level when variations in factors are expected. Energy or proxies of energy use are measured continuously. Periodic spot or short-term measurements may suffice when variations in factors are not expected. Savings are determined form analysis of baseline and reporting period energy use of proxies of energy use.	Direct measurements, engineering calculations, and/or component or system models often developed through regression analysis. Adjustments to models may be required.
Option C – Utility Data Analysis	This option is based on long-term, continuous, whole-building utility meter, facility level, or sub-meter energy (or water) data. Savings are determined from analysis of baseline and reporting period energy data. Typically, regression analysis is conducted to correlate with and adjust energy use to independent variables such as weather, but simple comparisons may also be used.	Based on regression analysis of utility meter data to account for factors that drive energy use. Adjustments to models are typically required.
Option D – Calibrated	Computer simulation software is used to model energy performance of a whole-facility (or sub-facility). Models must be calibrated with actual hourly or monthly billing data from the facility. Implementation of simulation modeling requires	Based on computer simulation model calibrated with whole-building or end-use

Computer Simulation	engineering expertise. Inputs to the model include facility characteristics; performance specifications of new and existing equipment or systems; engineering estimates, spot-, short-term, or long-term measurements of system components; and long-term whole-building utility meter data. After the model has been calibrated, savings are determined by comparing a simulation of the baseline with either a simulation of the performance period or actual utility data	metered data or both. Adjustments to models are required.

Each of the options can be used for a wide array of energy efficiency upgrades and each has different costs and complexities associated with it. When selecting an M&V approach, the following general rule of thumb can be applied:

OPTION A

- When magnitude of savings is low for the entire project or a portion of the project
- The risk for not achieving savings is low

OPTION B

- For simple equipment replacement projects
- When energy savings values per individual measure are desired
- When interactive effects are to be ignored or are estimated using estimating methods that do not involve long term measurements
- When sub-meters already exist that record the energy use of subsystems under consideration

OPTION C

- For complex equipment replacement and controls projects
- When predicted energy savings are in excess of 10 to 20 percent as compared with the record energy use
- When energy savings per individual measure are not desired
- When interactive effects are to be included
- When the independent variables that affect energy, use are complex and excessively difficult or expensive

OPTION D

- When new construction projects are involved
- When energy savings values per measure are desired
- When Option C tools cannot cost effectively evaluate particular measures or their interactions with the building when complex baseline adjustments are anticipated

DCO will perform measurement and verification of the energy units savings at the conclusion of each month in the first year of the energy units guarantee. After the first year, M&V will be performed and presented within 30 days of year end. Eatontown Board of Education will work with DCO to provide necessary information and provide access to any buildings to allow DCO to properly verify and measure energy savings. DCO's energy guarantee will be based on units of energy saved as determined from the baseline provided in the RFP, or adjusted baseline if original baseline is determined by both parties to be inaccurate.

Adjustments to the baseline and associated savings will be taken for weather, hours of operation, building usage, utility rate increases, code or statute changes, requirements listed in Table 1, and any other actions that adversely affect the savings beyond the control of DCO. Any savings discrepancies will be resolved to the satisfaction of both the Eatontown Board of Education and DCO in a timely manner.

As part of the optional energy guarantee, DCO uses weather normalization procedures to correct for the effect of weather variance on energy savings in subsequent years. Baseline energy and weather data are used to establish an algorithm to predict how the baseline building uses energy as a function of weather. The algorithm is then applied to subsequent years to correct for the impact weather may have on future building energy use. The weather normalization procedure and algorithms will be covered in detail as part of the optional energy guarantee contract provided to Eatontown Board of Education.

Maintenance Plan

Owner Tasks and Responsibilities:

As a general statement, Eatontown Board of Education or its 3rd party service providers shall be responsible for providing ongoing maintenance through the duration of the M&V period. DCO will review operational procedures and schedules associated with such things as the building automation/control upgrades as well as the manufacturers' published requirements for all installed equipment be it: quarterly, semi-annually or annually. In most cases, Eatontown Board of Education is already aware of or self-implementing similar maintenance practices on campus or has contracted a 3rd party for such services. Failure to properly maintain the equipment may cause energy savings goals to fall short.

Specific Areas of Consideration:

In order to sustain energy savings Eatontown Board of Education's Staff will be required to implement new maintenance tasks and even modify existing policies and practices. Outlined are two examples of specific instances.

Example 1. Advanced Building Operations Programming:

Eatontown Board of Education will be given specific training on the changes and advancements in the environmental operations and energy savings strategies. Eatontown Board of Education will be responsible for following the agreed upon guidelines associated with programmed schedules and any use of override functions.

Example 2. Verification of Proper Operations: Mechanical Equipment

Eatontown Board of Education will be required to assure that proper mechanical maintenance continues to be implemented on its mechanical equipment. Example: outside air dampers will require proper operation with the appropriate seals in order to maintain ECM(s) such as demand ventilation. DCO will periodically spot check system operations to verify the Owner or its 3rd party representative is implementing proper maintenance. Any deficiencies that may be identified will be brought to Eatontown Board of Education's attention for correction.

ENERGY SAVINGS PLAN

SECTION 6 – OPERATION & MAINTENANCE

It is critical to the success of achieving continued energy savings that Eatontown Board of Education develop and implement an Operation and Maintenance Plan. In this section are some recommendations for maintenance tasks for various pieces of equipment and systems to assist Eatontown Board of Education and/or 3rd party maintenance contractors.

Air Handling Units

Comprehensive Annual Inspection

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly
   a) Inspect the unit for cleanliness.
   b) Inspect the fan wheel and shaft for wear and clearance.
   c) Check the sheaves and pulleys for wear and alignment.
   d) Check the belts for tension, wear, cracks, and glazing.
   e) Verify tight bolts, set screws, and locking collars.
   f) Check dampers for wear, security and linkage adjustment.
   g) Verify clean condensate pan.
   h) Verify proper operation of the condensate drain.
   i) Verify clean air filters.
   j) Verify clean coils.
   k) Verify proper operation of the spray pump, if applicable.
   l) Verify smooth fan operation.
   m) Log operating conditions after system has stabilized.
   n) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.
4. Lubrication
   a) Lubricate the fan shaft bearings, if applicable.
   b) Lubricate the motor bearings, if applicable.
5. Controls and Safeties
   a) Test the operation of the low temperature safety device, if applicable.
   b) Test the operation of the high static pressure safety device, if applicable.
   c) Test the operation of the low static pressure safety device, if applicable.
   d) Check the thermal cutout on electric heaters, if applicable.
   e) Check the step controller, if applicable.

f) Check and record supply air and control air pressure, if applicable.
g) Verify the operation of the control system and dampers while the fan is operating.

6. Motor and Starter
   a) Clean the starter and cabinet.
   b) Inspect the wiring and connections for tightness and signs of overheating and discoloration. This includes wiring to the electric heat, if applicable.
   c) Check the condition of the contacts for wear and pitting.
   d) Check the contactors for free and smooth operation.
   e) Meg the motor and record readings.

Heating Inspection

1. Gas Heat Option
   a) Visually inspect the heat exchanger.
   b) Inspect the combustion air blower fan, and clean, if required.
   c) Lubricate the combustion air blower fan motor, if applicable.
   d) Verify the operation of the combustion air flow-proving device.
   e) Test the operation of the high gas pressure safety device, if applicable. Calibrate, if necessary.
   f) Test the operation of the low gas pressure safety device, if applicable. Calibrate, if necessary.
   g) Verify the operation of the flame detection device.
   h) Test the operation of the high temperature limit switch.
   i) Verify the integrity of the flue system.
   j) Verify the operation of the operating controls.
   k) Verify the burner sequence of operation.
   l) Verify proper gas pressure to the unit and/or at the manifold, if applicable.
   m) Perform combustion test. Make adjustments as necessary.
2. Electric Heat Option
   a) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   b) Check and calibrate operating and safety controls, if applicable.
   c) Verify the operation of the heating elements.
   d) Check voltage and amperage and compare readings with the watt rating on the heater.
3. Hot Water / Steam Heat Option
   a) Inspect control valves and traps.
   b) Check and calibrate all operating and safety controls.
   c) Verify the operation of the heating coils.
   d) Verify the operation of the unit low temperature safety device.

Scheduled Running Inspection

1. Check the general condition of the fan.
2. Verify smooth fan operation.
3. Check and record supply and control air pressure, if applicable.
4. Verify the operation of the control system.
5. Log the operating conditions after the system has stabilized.
6. Review operating procedures with operating personnel.
7. Provide a written report of completed work, operating log, and indicate uncorrected deficiencies detected.

Oil Sample/Spectrographic Analysis

1. Pull oil sample for spectrographic analysis

Refrigerant Sample/Analysis

1. Pull refrigerant sample for spectrographic analysis for contaminants (oil, water, and acid), using approved containers

Boilers

Comprehensive Annual Inspection

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly
   a) Secure and drain the boiler.
   b) Open the fire and water side for cleaning and inspection.
   c) Check heating surfaces and water side for corrosion, pitting, scale, blisters, bulges, and soot.
   d) Inspect refractory.
   e) Clean fire inspection glass.
   f) Check blow-down valve packing, and lubricate.
   g) Check and test boiler blow-down valve.

h) Perform hydrostatic test, if required.
i) Verify proper operation of the level float.
j) Gas Train Burner Assembly
    1. Check the gas train isolation valves for leaks.
    2. Check the gas supply piping for leaks.
    3. Check the gas pilot solenoid valve for wear and leaks.
    4. Check the main gas and the pilot gas regulators for wear and leaks.
    5. Test the low gas pressure switch. Calibrate and record setting.
    6. Test the high gas pressure switch. Calibrate and record setting.
    7. Verify the operation of the burner fan air flow switch.
    8. Inspect and clean the burner assembly.
    9. Inspect and clean the pilot igniter assembly.
    10. Inspect and clean the burner fan.
    11. Run the fan and check for vibration.
    12. Inspect the flue and flue damper.
    13. Burner Control Panel:
        a) Inspect the panel for cleanliness.
        b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
k) Clean burner fan wheel and air dampers. Check fan for vibration.
l) Verify tightness on linkage set screws.
m) Check gas valves for leakage (where test cocks are provided).
n) Verify proper operation of the feed water pump.
o) Verify proper operation of the feed water treating equipment.

4. Controls and Safeties
    a) Disassemble and inspect low water cutoff safety device.
    b) Reassemble boiler low water cutoff safety device with new gaskets.
    c) Clean contacts in program timer, if applicable.
    d) Check the operation of the low water cutoff safety device and feed controls.
    e) Verify the setting and test the operation of the operating and limit controls.
    f) Verify the operation of the water level control.

Startup/Checkout Procedure

1. Verify proper water level in the boiler
2. Test the safety/relief valve after startup (full pressure test).
3. Clean or replace fuel filters.

4. Clean fuel nozzles.
5. Inspect clean, and functionally test the flame scanner and flame safeguard relay.
6. Clean and adjust the ignition electrode.
7. Replace the vacuum tube in the flame safeguard control, if applicable.
8. Perform pilot turn down test.
9. Verify proper steam pressure.
10. Perform combustion test and adjust the burner for maximum efficiency.
11. Test the following items:
    a) Firing rate
    b) Fuel/air ratio
    c) CO2
    d) CO
    e) NOX
    f) Perform smoke test.
12. Review operating procedures
13. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

Mid-Season Running Inspection

1. Check the general condition of the unit.
2. Inspect the burner.
3. Adjust the burner controls to obtain proper combustion.
4. Check the operation of the pressure relief valve.
5. Check the operation of the low water cutoff and feed controls.
6. Check the setting and test the operation of the operating and limit controls.
7. Check the operation of the modulating motor.
8. Lift the safety/relief valves with at least 70% of rated pressure.
9. Blow down and try gauge cocks to confirm glass water level.
10. Check and test boiler blow down valve.
11. Log operating conditions after the system has stabilized.
12. Review operating procedures
13. Provide a written report of completed work, operating log, and indicate uncorrected deficiencies detected.

Seasonal Shut-down Procedure

1. Shut down boiler at boiler controls.
2. Shut off fuel lines at main valves.
3. Review operating procedures
4. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

Cooling Towers

Startup/Checkout Procedure

1. Fill the basin and verify the float level.
2. Verify the operation of the basin heaters
3. Verify the operation, setpoint, and sensitivity of the basin heater temperature control device.
4. Start the condenser water pumps.
5. Verify the balance of the return water through the distribution boxes.
6. Verify proper operation of the bypass valve(s), if applicable.
7. Operate fan and verify smooth operation.
8. Log operation after system has stabilized.
9. Review operating procedures
10. Provide a written report of completed work, operating log, and indicate uncorrected deficiencies detected.

Comprehensive Annual Inspection

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly
   a) Structure
      1. Disassemble all screens and access panels for inspection.
      2. Inspect the conditions of the slats, if applicable.
      3. Inspect the condition of the tower fill.
      4. Inspect the condition of the support structure.
      5. Inspect the condition of the basins (upper and lower) and/or spray nozzles.
      6. Verify clean basins and strainer(s).

7. Verify the condition and operation of the basin fill valve system.

b) Mechanical
   1. Inspect belts for wear, cracks, and glazing.
   2. Verify correct belt tension. Adjust the tension as necessary.
   3. Inspect sheaves and pulleys for wear, condition, and alignment.
   4. Inspect fan shaft and bearings for condition.
   5. Inspect fan assembly for condition, security, and clearances. (e.g. blade tip clearance).

4. Lubrication System
   a) Lubricate motor bearings.
   b) Lubricate fan shaft bearings.
5. Motor And Starter
   a) Clean the starter and cabinet.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   c) Check the condition of the contacts for wear and pitting.
   d) Check the contactor(s) for free and smooth operation.
   e) Meg the motor(s) and record readings.
   f) Check disconnect terminal block for wear, tightness and signs of overheating and discoloration.
   g) Check the condition and operation of the basin heater contactor(s).

Shut-Down Procedure

1. Check the general condition of the tower.
2. Turn off electrical power to basin heaters, tower fans, and pipe heaters as necessary.
3. Drain tower and condenser water piping.
4. Review operating procedures
5. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

Burners

Gas Train

1. Check the gas train isolation valves for leaks.

2. Check the gas supply piping for leaks.
3. Check the gas pilot solenoid valve for wear and leaks.
4. Check the main gas and the pilot gas regulators for wear and leaks.
5. Test the low gas pressure switch. Calibrate and record setting.
6. Test the high gas pressure switch. Calibrate and record setting.
7. Verify the operation of the burner fan air flow switch.
8. Inspect and clean the burner assembly.
9. Inspect and clean the pilot ignitor assembly.
10. Inspect and clean the burner fan.
11. Run the fan and check for vibration.
12. Inspect the flue and flue damper.
13. Burner Control Panel:
    a) Inspect the panel for cleanliness.
    b) Inspect wiring and connections for tightness and signs of overheating.
14. Clean burner fan wheel and air dampers. Check the fan for vibration.
15. Verify tightness of the linkage set screws.
16. Check the gas valves against leakage (where test cocks are provided

Oil Train

1. Check the gas train isolation valves for leaks.
2. Check the gas supply piping for leaks.
3. Check the gas pilot solenoid valve for wear and leaks.
4. Check the main gas and the pilot gas regulators for wear and leaks.
5. Test the low gas pressure switch. Calibrate and record setting.
6. Test the high gas pressure switch. Calibrate and record setting.
7. Verify the operation of the burner fan air flow switch.
8. Inspect and clean the burner assembly.
9. Inspect and clean the pilot ignitor assembly.
10. Inspect and clean the burner fan.
11. Run the fan and check for vibration.
12. Inspect the flue and flue damper.
13. Burner Control Panel:
    a) Inspect the panel for cleanliness.
    b) Inspect wiring and connections for tightness and signs of overheating.
14. Clean burner fan wheel and air dampers. Check the fan for vibration.
15. Verify tightness of the linkage set screws.

16. Check the gas valves against leakage (where test cocks are provided).

Dual Fuel Train

1. Check the gas train isolation valves for leaks.
2. Check the gas supply piping for leaks.
3. Check the gas pilot solenoid valve for wear and leaks.
4. Check the main gas and the pilot gas regulators for wear and leaks.
5. Test the low gas pressure switch. Calibrate and record setting.
6. Test the high gas pressure switch. Calibrate and record setting.
7. Verify the operation of the burner fan air flow switch.
8. Inspect and clean the burner assembly.
9. Inspect and clean the pilot ignitor assembly.
10. Inspect and clean the burner fan.
11. Run the fan and check for vibration.
12. Inspect the flue and flue damper.
13. Burner Control Panel:
    a) Inspect the panel for cleanliness.
    b) Inspect wiring and connections for tightness and signs of overheating.
14. Clean burner fan wheel and air dampers. Check the fan for vibration.
15. Verify tightness of the linkage set screws.
16. Check the gas valves against leakage (where test cocks are provided)

Energy Management System

Maintenance Inspection

1. Review reports for operational problems and trends.
2. Make a back-up copy of the BAS program.
3. Check for loose or damaged parts or wiring.
4. Check for any accumulation of dirt or moisture. Clean if required.
5. Verify proper electrical grounding.
6. Verify control panel power supplies for proper output voltages.
7. Inspect interconnecting cables and electrical connections.
8. Verify that manual override switches are in the desired positions.

9. Check the operation of all binary and analog outputs, if applicable.
10. Calibrate control devices, if applicable.
11. Verify the correct time and date.
12. Check and update the holiday schedules and daylight savings time.
13. Via terminal mode, view the event log and input/output points for any unusual status or override conditions.
14. Clean the external surfaces of the panel enclosure.
15. Review operating program and parameters.
16. Check cable connections for security.
17. Review operating procedures
18. Provide a written report of completed work, and indicate any uncorrected deficiencies detected.

Maintenance Inspection (Control Panels)

1. Control Panel
   a) Verify secure connections on all internal wiring, LAN, and communication links.
   b) Check for loose or damaged parts or wiring.
   c) Check for any accumulation of dirt or moisture. Clean if required.
   d) Remove excessive dust from heat sink surfaces
   e) Verify proper system electrical grounding.
   f) Verify proper output voltages on control panel power supplies.
   g) Check LED Indications to verify proper operation
   h) Verify LAN communications
   i) Verify that cards are seated and secured.
   j) Check wiring trunks and check for possible Error Code Indications
   k) Check voltage level of
   l) Verify the proper operation of critical control processes and points associated with this unit an make adjustments if necessary.
   m) Check Volatile memory available
   n) Cheek Non volatile memory available
   o) Check Processor idle time
   p) Clean external surfaces of the panel enclosure.
   q) Check modem operation, if applicable.
   r) View the event log and input/output points for any unusual status or override conditions.
   s) Verify correct time and date.
   t) Check and update holiday schedules, if applicable, and daylight savings time.

u) Review operating procedures with operating personnel.
v) Provide a written report of completed work, and indicate any uncorrected deficiencies detected.

Maintenance Inspection (EMS - Sequence of Operations)

Central Plant

In order to assure effective environmental conditioning while minimizing the cost to operate the equipment, technicians will review operating sequences and practices for the chiller plant. An initial survey of current equipment operating parameters will be conducted within the first 60 days of the contract term during cooling season. This survey will include:

1. Chiller(s) operation
2. Cooling tower(s) operation
3. Pump(s) operation
4. Economizer operation (where applicable)
5. Environmental safety

A detailed report of findings and recommendations for changes, if any, will be made. Agreed upon operational changes which require only adjustment of controls or programming will be made during regularly scheduled maintenance visits as part of this agreement at no additional cost. Any recommended alterations that require addition of devices or equipment will be accompanied by a guaranteed cost proposal reflecting the applicable discounts determined by this agreement.

Building Systems

In order to assure effective environmental conditioning while minimizing the cost to operate the equipment, technicians will review operating sequences and practices for covered airside systems. An initial survey of current systems operating parameters will be conducted within the first 60 days of the contract term, except seasonally operated systems, which will be surveyed during the appropriate operating season. This survey will include:

1. Time schedule(s)
2. Reset schedule(s)
3. Economizer changeover (where applicable)
4. Setpoints

5. Energy Management routines

A detailed report of findings and recommendations for changes, if any, will be made. Agreed upon operational changes which require only adjustment of controls or programming will be made during regularly scheduled maintenance visits as part of this agreement at no additional cost. Any recommended alterations that require addition of devices or equipment will be accompanied by a guaranteed cost proposal reflecting the applicable discounts determined by this agreement.

Fans

Maintenance Procedure

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly
   a) Check the general condition of the unit.
   b) Verify tightness of the fan, fan guards, louvers, etc.
   c) Verify clean burner assembly.
   d) Check sheaves and pulleys for wear and alignment, if applicable.
   e) Check belts for tension, wear, cracks, and/or glazing.
4. Lubrication
   a) Lubricate the fan motor, if applicable.
   b) Lubricate the fan bearings as necessary.
5. Controls and Safeties
   a) Verify proper operation of the temperature control device.
   b) Verify proper operation of the high temperature control device.
   c) Verify proper operation of the fan switch.
   d) Verify proper operation of the pilot safety device, if applicable.
6. Electrical
   a) Inspect wiring and connections for tightness and signs of overheating and discoloration.
7. Startup and Checkout
   a) Start the unit.
   b) Verify proper combustion air to the burner.
   c) Verify proper gas pressure to the burner.

d) Check the flame for proper combustion.

Comprehensive Annual Inspection

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly
   a) Disassemble all screens and panels necessary to gain access to the fan mechanism.
   b) Disassemble the control mechanism (AVPB only).
   c) Clean all accessible rotor components to include control pitch mechanism (AVPB only).
   d) Inspect blades for wear.
   e) Inspect blade arms for wear (AVPB only).
   f) Check blade tip clearance.
   g) Check for oil leak on the blade bearing housing (AVPB only).
   h) Clean motor and fan housing.
   i) Reassemble all removed screens and plates.
4. Lubrication
   a) Lubricate the motor bearings.
   b) Lubricate the shaft bearings (AVPA only).
5. Controls and Safeties
   a) Test the operation of the high static safety device. Calibrate and record setting.
   b) Test the operation of the low static safety device. Calibrate and record setting.
   c) Test the operation of the vibration safety device. Calibrate and record setting.
   d) Verify the operation of the phase monitor, if applicable.
   e) Inspect pneumatic and electrical controls for condition and calibration.
   f) Verify proper operation.
6. Motor and Starter
   a) Clean the starter and cabinet.
   b) Clean the disconnect switch and cabinet at the fan, if applicable.
   c) Inspect the wiring and connections for tightness and signs of overheating and discoloration.
   d) Check the condition of the contacts for wear and pitting.
   e) Check the contactors for free and smooth operation.
   f) Meg the motor and record readings.
7. Startup / Checkout Procedure
   a) Start the fan.
   b) Verify the operation of the starter.

c) Check and record supply and control air pressure.
d) Verify the operation of the control system while the fan is operating.
e) Log the operating conditions after the system has stabilized.
f) Review operating procedures with operating personnel.
g) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

Scheduled Running Inspection (fans)

1. Check the general operation of the fan.
2. Check and record supply and control air pressure.
3. Verify the operation of the control system.
4. Log the operating conditions after the system has stabilized.
5. Review operating procedures with operating personnel.
6. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

Comprehensive Annual Inspection (fans)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly
   a) Verify tight bolts, set screws, and locking collars.
   b) Inspect sheaves and pulleys for wear and alignment.
   c) Inspect belts for tension, wear, cracks, and glazing.
   d) Inspect dampers for wear, security, and clearances, if applicable.
   e) Verify clean air filters.
   f) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.
4. Lubrication
   a) Lubricate fan bearings.
   b) Lubricate motor bearings, if applicable.
5. Controls and Safeties
   a) Verify the operation of the control system while the fan is operating.
   b) Verify the setting of the low temperature safety device, if applicable.
   c) Verify the operation of the pre-heat control device, if applicable.
   d) Verify the operation of the cooling control device, if applicable.

e) Verify the operation of the re-heat control device, if applicable.
f) Verify the operation of the humidity control device, if applicable.

6. Motor and Starter
   a) Clean the starter and cabinet.
   b) Inspect the wiring and connections for tightness and signs of overheating and discoloration.
   c) Check the condition of the contacts for wear and pitting.
   d) Check the contactors for free and smooth operation.
   e) Meg the motor and record readings.
   f) Check volts and amps of the motor.

Lubricate/Grease Bearings

1. Lubricate and/or grease bearings according to manufacturer's specifications

MEG Motor

1. Check the integrity of the insulation on the motor windings and the motor leads, using a megohm meter.

Coils

Maintenance Procedure

1. Record and report abnormal conditions.
2. Visually inspect the coil for leaks.
3. Inspect the coil for cleanliness.

Pumps

Annual Inspection

1. Record and report abnormal conditions, measurements taken, etc.

2. Review logs for operational problems and trends.
3. General Assembly
   a) Check motor shaft and pump shaft for alignment, if applicable.
   b) Inspect the coupling for wear.
   c) Verify that the shaft guard is in place and tight, if applicable.
   d) Verify water flow through the pump.

   e) Check for leaks on the mechanical pump seals, if applicable.
   f) Verify proper drip rate on the pump seal packing, if applicable.
   g) Verify smooth operation of the pump.
   h) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.
4. Lubrication
   a) Lubricate the motor bearings as necessary.
   b) Lubricate the pump bearings as necessary.
5. Motor and Starter
   a) Clean the starter and cabinet.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   c) Meg the motor.
   d) Verify tight connections on the motor terminals.
   e) Check the condition of the contacts for wear and pitting, if applicable.
   f) Check the contactors for free and smooth operation.
   g) Verify proper volts and amps.

Pump Run Inspection

1. Verify smooth operation of the pump.
2. Check for leaks on the mechanical pump seals, if applicable.
3. Verify proper drip rate on the pump seal packing, if applicable.
4. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

Mechanical Starters with Electronic Controls

Comprehensive Annual Maintenance

1. Clean the starter and cabinet.
2. Inspect wiring and connections for tightness and signs of overheating and discoloration.
3. Check condition of the contacts for wear and pitting.
4. Check contactors for free and smooth operation.
5. Check the mechanical linkages for wear, security, and clearances.
6. Verify the overload settings.

VFD Starters

Comprehensive Annual Maintenance

1. Clean the starter and cabinet.
2. Inspect wiring and connections for tightness and signs of overheating and discoloration.
3. Check the tightness of the motor terminal connections.
4. Verify the operation of the cooling loop.
5. Verify proper operation of the frequency drive.

Rooftop Units

Comprehensive Annual Maintenance

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly
   a) Inspect for leaks and report results.
   b) Calculate refrigerant loss rate and report to the customer.
   c) Repair minor leaks as required (e.g. valve packing, flare nuts).
   d) Visually inspect condenser tubes for cleanliness.
4. Controls and Safeties
   a) Inspect the control panel for cleanliness.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.

c) Verify the working condition of all indicator/alarm lights, if applicable.
d) Test the low water temperature control device. Calibrate and record setting.
e) Test the low evaporator pressure safety device. Calibrate and record setting.
f) Test the oil pressure safety device. Calibrate and record setting, if applicable.
g) Check programmed parameters of RCM control, if applicable.

5. Lubrication System
   a) Check oil level in the compressor.
   b) Test oil for acid content and discoloration. Make recommendations to the customer based on the results of the test.
   c) Verify the operation of the oil heater. Measure amps and compare reading with the watt rating of the heater.

6. Motor and Starter
   a) Clean the starter and cabinet.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   c) Check condition of the contacts for wear and pitting.
   d) Check the contactors for free and smooth operation.
   e) Check the tightness of the motor terminal connections.
   f) Meg the motor and record readings.
   g) Verify the operation of the electrical interlocks.
   h) Measure voltage and record. Voltage should be nominal voltage ± 10%.

Comprehensive Maintenance Inspection (RTU Heating Cycle)

1. Perform heating inspection/maintenance applicable to the unit (steam/hot water, gas, electric).
2. Verify smooth operation of the fans.
3. Check the belts for tension, wear, cracks, and glazing.
4. Verify clean air filters.
5. Gas Heat Option
   a) Visually inspect the heat exchanger.
   b) Inspect the combustion air blower fan, and clean, if required.
   c) Lubricate the combustion air blower fan motor, if applicable.
   d) Verify the operation of the combustion air flow-proving device.
   e) Test the operation of the high gas pressure safety device, if applicable. Calibrate, if necessary.

f) Test the operation of the low gas pressure safety device, if applicable. Calibrate, if necessary.
g) Verify the operation of the flame detection device.
h) Test the operation of the high temperature limit switch. i.. Verify the integrity of the flue system.
i) Verify the operation of the operating controls.
j) Verify the burner sequence of operation.
k) Verify proper gas pressure to the unit and/or at the manifold, if applicable.
l) Perform combustion test. Make adjustments as necessary.

6. Electric Heat Option
   a) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   b) Check and calibrate operating and safety controls, if applicable.
   c) Verify the operation of the heating elements.
   d) Check voltage and amperage and compare readings with the watt rating on the heater.

7. Hot Water / Steam Heat Option
   a) Inspect control valves and traps.
   b) Check and calibrate all operating and safety controls.
   c) Verify the operation of the heating coils.
   d) Verify the operation of the unit low temperature safety device.

Mid-Season Cooling Inspection (RTU)

1. Check the general condition of the unit.
2. Log the operating condition after system has stabilized.
3. Verify the operation of the control circuits.
4. Analyze the recorded data. Compare the data to the original design conditions.
5. Review operating procedures with operating personnel.
6. Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

Comprehensive Maintenance Inspection (RTU - Cooling Cycle)

1. Record and report abnormal conditions, measurements taken, etc.
2. Review logs for operational problems and trends.
3. General Assembly
   a) Inspect for leaks and report results.

b) Calculate refrigerant loss rate and report to the customer.
c) Repair minor leaks as required (e.g. valve packing, flare nuts).
d) Check pulleys and sheaves for wear and alignment.
e) Check belts for tension, wear, cracks, and glazing.
f) Verify clean evaporator coil, blower wheel, and condensate pan.
g) Verify clean air filters.
h) Verify proper operation of the condensate drain.
i) Verify proper operation of the dampers and/or inlet guide vanes, if applicable.

4. Controls and Safeties
   a) Inspect the control panel for cleanliness.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   c) Verify the working condition of all indicator/alarm lights, if applicable.
   d) Test the low evaporator pressure safety device. Calibrate and record setting, if applicable.
   e) Test the high condenser pressure safety device. Calibrate and record setting, applicable.
   f) Test the oil pressure safety device, if applicable. Calibrate and record setting.
   g) Test the high static pressure safety device, if applicable. Calibrate and record setting.
   h) Verify the operation of the static pressure control device, if applicable.
5. Lubrication
   a) Verify the operation of the oil heater, if applicable.
   b) Lubricate the fan bearings as required.
   c) Lubricate the fan motor bearings as required.
   d) Lubricate the damper bearings, if applicable.
6. Motor and Starter
   a) Clean the starter and cabinet.
   b) Inspect wiring and connections for tightness and signs of overheating and discoloration.
   c) Check the condition of the contacts for wear and pitting.
   d) Check the contactors for free and smooth operation.
7. Startup /Checkout Procedure
   a) Verify the operation of the oil heater.
   b) Verify full water system, including the cooling tower and the condenser.
   c) Verify clean cooling tower and strainers.
   d) Test all flow-proving devices on the condenser water circuit.
   e) Start the condenser water pump and the cooling tower fan(s).
   f) Verify flow rate through the condenser.
   g) Start the unit.

h) Verify smooth operation of the compressor(s) and fan(s).
i) Check the setpoint and sensitivity of the temperature control device.
j) Verify the operation of the condenser water temperature control device.
k) Verify clean condenser using pressure and temperature.
l) Check operation and setup of the Unit Control Module.
m) Check the superheat and subcooling on the refrigeration circuit(s).
n) Log the operating conditions after the system has stabilized.
o) Review operating procedures with operating personnel.
p) Provide a written report of completed work, operating log, and indicate any uncorrected deficiencies detected.

ENERGY SAVINGS PLAN

SECTION 7 – OPTIONAL ENERGY GUARANTEE

OPTIONAL ENERGY GUARANTEE OVERVIEW

NOTE: *The following is meant only to serve as a description of an optional energy guarantee and does not constitute any contractual obligations between Eatontown Board of Education and DCO. If Eatontown Board of Education chooses to implement an energy guarantee contract, a separate document will be used based on mutual agreement and acceptance of all parties of its terms and conditions.*

A successful energy project consists of a partnership between an ESCO and Owner. Both parties have defined roles and accept their individual responsibilities as well as support any joint initiatives of the program as defined in the RFP and this document. Both DCO and the Eatontown Board of Education will have a role in ongoing maintenance and operations as defined in the agreed-upon energy guarantee contractual documents. Both parties will be required to meet their obligations for the guaranteed energy units savings (referred to as "guarantee or savings") to be achieved and to ensure the guarantee stays intact.

DCO will guarantee Eatontown Board of Education will achieve 100% of the total energy units savings per the provisions of the agreed-upon energy guarantee contractual documents based on the final selection of ECMs and their associated energy savings as measured and verified by the Owner's third-party, independent firm. The energy savings will be in energy units, not dollars as DCO has no control over the costs of utilities. The energy units guarantee contract shall commence thirty (30) days after the start-up and commissioning of the last Energy Conservation Measure (ECM) and be enforced for a period of one (1) year or until terminated by Eatontown Board of Education. The one (1) Year Guarantee is provided by DCO for a cost of $0. The Measurement & Verification required by ESIP Legislation in association with the acceptance of an Energy Savings Guarantee will be provided by DCO Energy at a cost of 0.72% of the Hard Costs of the ECMs as outlined in Form V of the RFP Response (also shown Section 4 of this document).

SAVINGS VERIFICATION

There are events that cause energy savings to change. Eatontown Board of Education and DCO will agree to baseline energy consumption that represents the facility's energy use and cost prior to the date of any Agreement (the "Base Year") and parameters, which affect the energy usage and cost of the facility, including but not limited to, utility rates, local weather profile, facility square footage, environmental conditions, schedules (e.g., lighting, HVAC) and an inventory of equipment in the facility. Energy savings are determined by comparing

measured energy use or demand before and after implementation of an energy savings program.

ECM ENERGY SAVINGS = BASELINE ENERGY USE – POST INSTALLATION ENERGY USE +/- ADJUSTMENTS

Changes in estimated energy savings fall into two categories. These categories are Routine Adjustments and Non-Routine Adjustments. Routine Adjustments are expected changes during the savings reporting period to energy governing factors (e.g. weather). DCO uses IPMVP approved mathematical techniques to determine adjustments. Non-Routine Adjustments include energy-governing factors which are not usually expected to change, such as the facility size, the design and operation of installed equipment, occupancy and the type of occupants or any physical changes to the building or equipment that impact the facilities' utility use. These factors will be monitored for change throughout the reporting period.

DCO will perform monthly utility bill analysis and audit reports which compare the current year with base year energy consumption and costs. DCO will perform periodic on-site analysis to determine whether mechanical and electrical systems are operating at optimal efficiency and to assess the occupancy and operational schedules of the buildings.

As part of the optional energy guarantee, DCO uses weather normalization procedures to correct for the effect of weather variance on energy savings in subsequent years. Baseline energy and weather data are used to establish an algorithm to predict how the baseline building uses energy as a function of weather. The algorithm is then applied to subsequent years to correct for the impact weather may have on future building energy use. The weather normalization procedure and algorithms will be covered in detail as part of the optional energy guarantee contract provided to Eatontown Board of Education.

ENERGY SAVINGS PLAN

APPENDICIES

APPENDIX LIST	
APPENDIX A	Construction Contingency Allowance
APPENDIX B	Design Bid Build Procedures
APPENDIX C	Operations & Maintenance Savings
APPENDIX D	Project Changes in Financing
APPENDIX E	Incentives in Debt Service
APPENDIX F	Lighting Line by Lines
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ENERGY SAVINGS PLAN

APPENDIX A – CONSTRUCTION CONTINGENCY ALLOWANCE

Appendix A – Construction Contingency Allowance

Experience shows that during the construction phase there are four major categories of potential change of scope issues that benefit from having an appropriate Construction Contingency Allowance (CCA).

- Unknown conditions
- Building inspector's modifications
- Project owner requested changes
- Design clarifications or modifications

Unknown Conditions

Renovations to older facilities have greater potential for revealing unknown. Missing or inaccurate Blueprints, deviations from the original blue prints by the original builder and unknown or undocumented modifications during the life of the facility.

Areas such as behind a wall/roof/equipment or under the slab can bring unforeseen conditions which can delay the new construction and change the anticipated scope of the work. Therefore, it is advisable to dedicate a CCA that is higher than that for new construction.

Building Inspection Modifications

A plan review for the local building jurisdiction reviews the construction documents prior to issuing a building permit. However, there remains the likelihood that the building inspector will request modifications to the plans based upon experience and their interpretation of the applicable building code.

While we can ask for code review and documentation, if you hope to get a Certificate of Occupancy under a tight schedule from this same inspector requested modifications will need to be implemented as successfully appeals take time.

Whether it is adding an extra exit sign, smoke detector or fire extinguisher, or whether it is something more significant, it may require more work from the contractor, thus added expense. The CCA is intended to be the source of funds necessary for these requested modifications.

Project Owner Requested Changes

It is nearly impossible to express your every desire during the design phase. You will always see something during construction that you would like to change.

There is nothing necessarily wrong with that.

The CCA is intended to be the source of funds necessary for these requested changes.

Design Clarifications or Modifications

No designer has ever developed the perfect set of construction documents.

There are always items that can be detailed better or more clearly. The design intent should be adequately reflected in the drawings and specifications so that the contractor can bid and build the ECM to meet the design intent.

However, there will be times during construction when the builder will not be readily able to identify the exact intent of particular details or systems. At that time the builder will submit a Request for Information (RFI) to the designer for clarification or more information. The designer will issue clarifications or directives so that the builder can continue to meet the design intent.

On occasion, the RFI will reveal that something more than was shown in the construction documents is necessary to fulfill the design intent. The clarification or modification may impact the scope of the work to a degree that additional construction costs become necessary.

As long as the design omission is not negligent, the CCA is intended to be the source of funds necessary for these design clarifications or modifications.

Allowance Method

Detailed plans, schematics and specifications for Eatontown Board of Education were not available to deliver a cost estimate for each ECM. The budgetary costs carried in the project are based on good faith estimates, contractor supplied budgets for similar ECMs on other recent projects and a database of actual installed costs for various ECMs.

a. Allowance Amount (6.04% of Hard Costs)

BID PACKAGE ALLOWANCE SCHEDULE	
ECM	CONTINGENCY AMOUNT
Solar PPA	$0
LED Lighting Replacement	$34,149
Upgrade and Enhance Energy Management System	$39,076
Rooftop Unit Replacement	$113,742
Combined Heat & Power Unit	$16,607
Premium Efficiency Pump Motors and VFDs	$1,812
Ductwork Renovations	$2,114
Destratification Fans	$3,140
TOTAL	**$210,639**

Project total construction contingency allowance amount is 6.04% of estimated hard costs and is agreed upon by DCO and Eatontown Board of Education

ENERGY SAVINGS PLAN

APPENDIX B – DESIGN BID BUILD

Appendix B – Design Bid Build Procedures

Design–bid–build (or **design/bid/build**, and abbreviated **D–B–B** or **D/B/B** accordingly), also known as **Design–tender** (or "design/tender") **traditional method** or **hard bid** is the method of delivery for this project.

Design–bid–build is the traditional method for project delivery and differs in several substantial aspects from design–build.

There are three main sequential phases to the design–bid–build delivery method:

- The design phase
- The bidding (or tender) phase
- The construction phase

Design Phase

In this phase DCO will design and produce bid documents, including construction drawings and technical specifications, on which various contractors will in turn bid to construct the project.

The Energy Savings Plan (ESP) is intended to document owner's project requirements and provide a conceptual and/or schematic design and good faith estimates.

With the ESP DCO will bring in other design professionals including mechanical, electrical, and plumbing engineers (MEP specifications engineers), a fire protection engineer, structural engineer, sometimes a civil engineer and a landscape architect to help complete the construction drawings and technical.

The design document should reflect the intent of the energy savings plan for scope, price, savings, operations & maintenance savings, incentive and schedule.

The finished bid documents are coordinated by the DCO and owner for issuance to contractors during the bid phase.

Bid (or tender) phase

Bidding is according to NJ Public Bid Law and is "open", in which any qualified bidder may participate.

The various contractors bidding obtain bid documents, and then put them out to multiple subcontractors for bids on sub-components of the project.

Questions may arise during the bid period, and DCO will issue clarifications or corrections to the bid documents in the form of addenda.

From these elements, the contractor compiles a complete bid for submission by the established closing date and time bid date.

Bids are to be based on a base bid lump sum plus alternates, bid requirements and alternates are elucidated within the bid documents.

Once bids are received, DCO reviews the bids, seeks any clarifications required of the bidders, investigates contractor qualifications, ensures all documentation is in order (including bonding if required), and advises the owner as to the ranking of the bids.

If the bids fall in a range acceptable to the owner, the project is awarded to the contractor with the lowest reasonable bid.

In the event that all of the bids do not satisfy the needs of the owner the following options become available to DCO:

- Re-bid the construction of the project on a future when monies become available and/or construction costs go down.
- Revise the design of that ECM (at no cost to the client) so as to make the project smaller or reduce features or elements of the project to bring the cost down. The revised bid documents can then be issued again for bid.
    - DCO will provide guidance on energy savings, operation and maintenance savings and incentives to ensure the project is self-funding.
- Revise the design of future ECM(s) (at no cost to the client) so as to make the project smaller or reduce features or elements of the project to bring the cost down. The current bid package can then be contracted
    - DCO will provide guidance on energy savings, operation and maintenance savings and incentives to ensure the project is self-funding.

Construction phase

Once the construction of the project has been awarded to the contractor, the bid documents (e.g., approved construction drawings and technical specifications) may not be altered.

The necessary permits (for example, a building permit) must be achieved from all jurisdictional authorities in order for the construction process to begin.

Should design changes be necessary during construction, whether initiated by the contractor, owner, or as discovered by the architect, DCO will issue sketches or written clarifications and handle the project through allowance (See Appendix A).

The contractor may be required to document "as built" conditions to the owner.

Bidding Method

1. To achieve energy savings and fund debt service payments as rapidly as possible the bid packages will be bid in the following order:

BID METHOD SCHEDULE		
ECM	COST + ALLOWANCE	SAVINGS
Solar PPA	$0	$116,976
LED Lighting Replacement	$599,651	$46,155
Upgrade and Enhance Energy Management System	$686,158	$72,470
Rooftop Unit Replacement	$1,997,282	$11,896
Combined Heat & Power Unit	$291,607	$6,637
Premium Efficiency Pump Motors and VFDs	$31,812	$1,897
Ductwork Renovations	$37,114	$0
Destratification Fans	$55,140	$3,239
TOTAL	**$3,698,763**	**$259,270**

2. Bids in group 1 (Green) are within 15% of budget value they will be awarded.
3. Bids in group 2 (Yellow) may be value engineered from the project to meet budget
    a. DCO will provide the impact of ECMs value engineered:
        i. Energy Savings
        ii. Operations and Maintenance Savings
        iii. Incentive
4. Bids in group 3 (Red) may be value engineered **or removed** from the project to meet budget
    a. DCO will provide the impact of ECMs value engineered or removed:
        i. Energy Savings
        ii. Operations and Maintenance Savings
        iii. Incentive
5. As per ESIP law DCO fee will be applied to the ECM hard cost.
    a. DCO will receive no compensation for bids that are under budget
    b. DCO will receive no penalty for bids that are over budget
6. If the budget overruns make savings unachievable at the current budget, DCO will provide additional ECMs above the budget to meet the required energy savings

    Project bidding strategy is agreed upon by DCO and Eatontown Board of Education

ENERGY SAVINGS PLAN

APPENDIX C – OPERATIONS AND MAINTENANCE SAVINGS

Appendix C – Operation & Maintenance Savings

Operations and Maintenance and other non-energy-related cost savings are allowable in NJ ESIPs, and are defined as reduction in expenses (other than energy cost savings) related to energy and water consuming equipment:

Energy-related cost savings can result from avoided expenditures for operations, maintenance, equipment repair, or equipment replacement due to the ESIP project.

Sources of O&M savings include:

- Termination of service personnel
- Lower maintenance service contract costs
- Decrease in repair costs
    - Avoided repair and replacement costs as a result of replacing old and unreliable equipment
    - Material savings due to new equipment warranties
    - Material savings due to the longer life items not needing replacement
        - In particular, reduction in florescent bulbs due to LED

Termination of service personnel

As a result of the ESIP, a number of the client's maintenance staff members may no longer be required. If there will be a reduction in the government's maintenance staff, O&M savings can be claimed.

A problem could arise if the maintenance staff is not reduced. Then it would be necessary to determine what new O&M responsibilities the facility has taken on, or savings should not be claimed. For example, it could be that a new building was constructed. During the performance period, it is important to establish that any increased maintenance was not due to the equipment installed under the ESIP

Lower maintenance service contract costs

Prior to the implementation of the ESIP mechanical and electrical equipment was maintained by a third party under a maintenance contract. The ESIP replaces the aging equipment with newer, more efficient equipment, which can reduce the service costs to the client.

Decrease in repair costs

The client is responsible for maintenance both before and after the equipment installation. Although there is no reduction in staff for which to claim labor savings, there will be cost savings on replacement materials.

Material-related savings frequently result from lighting and lighting controls projects.

For this project, lighting maintenance savings will result from the following:

1. Reduced material requirements (e.g., lamps)
2. Reduced operating time — Control measures increase equipment life by reducing the burn time of lamps and ballasts
3. Warranty-related savings — newly installed lamps, and fixtures come with a manufacturer warranty of 10 years.

O&M Savings

Project total O&M savings to fund debt service amount: $13,650

Project O&M Savings strategy is agreed upon by DCO and Eatontown Board of Education.

ENERGY SAVINGS PLAN

APPENDIX D – PROJECT CHANGES IN FINANCING

Appendix D – Project Changes in Financing

The Energy savings plan has been approved using:

Interest rate of: 2.25%
Term: ..... 20 Years
Construction Term ..... 1 Year
Construction Interest Only Payment of ..... TBD by Eatontown financial advisor
Annual Surplus of no less than $2,400

During financing DCO will provide assistance but does not guarantee the timing of savings or incentives.

While beneficial to the client financing changes are the responsibility of the client, bond counsel and/or financial advisor. DCO represents in no way advice on these financial items

Financial items may include but are not limited to:

- Timing of payments
- Splitting payments into bi-annual, tri-annual, etc.
- Coordination with the client's fiscal year
- Local finance board material, forms and presentations
- Multiple tiered interest rates

ENERGY SAVINGS PLAN

APPENDIX E – INCENTIVES IN DEBT SERVICE

Appendix E – Incentives in Debt Service

Estimated incentive values were calculated in accordance with the New Jersey Clean Energy Program Guidelines. The total incentive amount was calculated to be $569,877 in rebates and incentives - 54%, $308,992, has been applied to the project financial analysis (See Section 4). Please see below and Appendix F for building-by-building details.

Incentive Totals

BUILDING	INCENTIVE TYPE	QUANTITY	UNITS	INCENTIVE $/UNIT	INSTALL INCENTIVE	YEAR 1 INCENTIVE	YEAR 2 INCENTIVE	SUBTOTAL	TOTAL
EATONTOWN BOARD OF EDUCATION	P4P 2&3 (electric)	1,139,974	kWh	$0.44	$0	$250,794	$250,794	$501,588	$569,877
	P4P 2&3 (natural gas)	13,419	therms	$5.00	$0	$33,547	$33,547	$67,093	
	Direct Install				$0	$0	$0	$0	
	SmartStart	Various	Various	Various	$0	$1,195	$0	$1,195	
	Combined Heat & Power	0	kW	$0	$0	$0	$0	$0	
	Demand Response	0	kW		$0	$0	$0	$0	
	Energy Efficiency	192	kW	$32.45	$0	$0	$0	$0	
	Sustainable New Jersey	0			$0	$0	$0	$0	
					$0	$0	$0	$0	
				TOTALS	$0	$285,536	$284,341	$569,877	

Incentive Data

BUILDING	INCENTIVE TYPE	QUANTITY	UNITS	INCENTIV $/UNIT	INSTALL INCENTIVE	YEAR 1 INCENTIVE	YEAR 2 INCENTIVE	SUBTOTAL	TOTAL
Memorial Middle School	P4P 2&3 (electric)	402,838	kWh	$0.44		$88,624	$88,624	$177,249	$202,048
Memorial Middle School	P4P 2&3 (natural gas)	4,960	therms	$5.00		$12,399	$12,399	$24,799	
Meadowbrook Elementary	P4P 2&3 (electric)	265,523	kWh	$0.44		$58,415	$58,415	$116,830	$131,595
Meadowbrook Elementary	P4P 2&3 (natural gas)	2,953	therms	$5.00		$7,382	$7,382	$14,765	
Margaret L Vetter Elementary	P4P 2&3 (electric)	260,641	kWh	$0.44		$57,341	$57,341	$114,682	$135,268
Margaret L Vetter Elementary	P4P 2&3 (natural gas)	4,117	therms	$5.00		$10,293	$10,293	$20,586	
Woodmere Elementary	P4P 2&3 (electric)	210,972	kWh	$0.44		$46,414	$46,414	$92,828	$99,771
Woodmere Elementary	P4P 2&3 (natural gas)	1,389	therms	$5.00		$3,472	$3,472	$6,944	
Transportation Facility	SmartStart	Various	Various	Various		$1,195		$1,195	$1,195

No implied and/or written guarantee is being made with respective to the receipt of incentives. All incentives estimates carry inherent risks that may jeopardize the receipt of them. Therefore, Eatontown Board of Education acknowledges and accepts that any project proposed should not rely on the receipt of incentives as a reason to implement it.

ENERGY SAVINGS PLAN

APPENDIX F – LIGHTING LINE BY LINES

SPREADSHEETS PROVIDED IN A SEPARATE FILE

ENERGY SAVINGS PLAN

APPENDIX G – LOCAL GOVERNMENT ENERGY AUDITS

ENERGY SAVINGS PLAN

APPENDIX H – SCHEDULES BY BUILDING

Memorial Middle School – Baseline Schedules

Memorial Middle School – Administration - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-9pm	70F/72F	65F/80F	5am-9pm	70F/72F	65F/80F
Friday	5am-9pm	70F/72F	65F/80F	5am-9pm	70F/72F	65F/80F
Saturday – Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Memorial Middle School – Classroom - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-9pm	70F/72F	65F/80F	5am-9pm	70F/72F	65F/80F
Friday	5am-9pm	70F/72F	65F/80F	5am-9pm	70F/72F	65F/80F
Saturday – Sunday	5am-9pm	70F/72F	65F/80F	5am-9pm	70F/72F	65F/80F
Holiday	5am-9pm	70F/72F	65F/80F	5am-9pm	70F/72F	65F/80F

Memorial Middle School – Gym + Multi-Purpose Room - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Friday	5am-9pm	70F/72F	65F/80F	5am-9pm	70F/72F	65F/80F
Friday	5am-9pm	70F/72F	65F/80F	5am-9pm	70F/72F	65F/80F
Saturday-Sunday	5am-7pm	70F/72F	65F/80F	5am-7pm	70F/72F	65F/80F
Holiday	5am-7pm	70F/72F	65F/80F	5am-7pm	70F/72F	65F/80F

Memorial Middle School - Administration - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Friday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Saturday – Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Memorial Middle School - Classroom - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Friday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Saturday – Sunday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Holiday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle

Memorial Middle School – Gym + Multi-Purpose Room - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Friday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Saturday-Sunday	5am-7pm	ON	Cycle	5am-7pm	ON	Cycle
Holiday	5am-7pm	ON	Cycle	5am-7pm	ON	Cycle

Memorial Middle School - DCV Schedule - RTU-1-2 Only - (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	15% of SA CFM	7am-6pm	Design OA	15% of SA CFM
Friday	7am-6pm	Design OA	15% of SA CFM	7am-6pm	Design OA	15% of SA CFM
Saturday – Sunday	N/A	N/A	15% of SA CFM	N/A	N/A	15% of SA CFM
Holiday	N/A	N/A	15% of SA CFM	N/A	N/A	15% of SA CFM

Memorial Middle School – Energy Management System Schedules

Memorial Middle School – Administration + Classroom- Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday – Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Memorial Middle School – Gym + Multi-Purpose Room - Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday-Sunday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F
Holiday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F

Memorial Middle School - Administration + Classroom- Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday – Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Memorial Middle School – Gym + Multi-Purpose Room - Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday-Sunday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle
Holiday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle

Memorial Middle School - DCV Schedule - Administration + Classroom (RTU-1-2) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	5% of SA CFM	7am-6pm	Design OA	5% of SA CFM
Friday	7am-6pm	Design OA	5% of SA CFM	7am-6pm	Design OA	5% of SA CFM
Saturday – Sunday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM
Holiday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM

Memorial Middle School - DCV Schedule - Classroom (RTU-6-9 and Admin RTU 1-3) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	5% of SA CFM	7am-4pm	Design OA	5% of SA CFM
Friday	7am-6pm	Design OA	5% of SA CFM	7am-4pm	Design OA	5% of SA CFM
Saturday – Sunday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM
Holiday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM

Memorial Middle School - DCV Schedule - Gym + Multi-Purpose Room (RTU-3-5) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Friday	7am-6pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Saturday – Sunday	7am-4pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Holiday	7am-4pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM

Meadowbrook Elementary – Baseline Schedules

Meadowbrook Elementary School – Administration - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-5pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-5pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday – Sunday	5am-3pm	70F/72F	65F/80F	5am-3pm	70F/72F	65F/80F
Holiday	5am-3pm	70F/72F	65F/80F	5am-3pm	70F/72F	65F/80F

Meadowbrook Elementary School – Classroom - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday – Sunday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Holiday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F

Meadowbrook Elementary School –Multi-Purpose Room - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday-Sunday	5am-7pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Holiday	5am-7pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F

Meadowbrook Elementary School - Administration - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-5pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-5pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday – Sunday	5am-3pm	ON	Cycle	5am-3pm	ON	Cycle
Holiday	5am-3pm	ON	Cycle	5am-3pm	ON	Cycle

Meadowbrook Elementary School - Classroom - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday – Sunday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Holiday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle

Meadowbrook Elementary School – Gym + Multi-Purpose Room - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday-Sunday	5am-7pm	ON	Cycle	5am-4pm	ON	Cycle
Holiday	5am-7pm	ON	Cycle	5am-4pm	ON	Cycle

Meadowbrook Elementary School – Gym + Multi-Purpose Room - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday-Sunday	5am-7pm	ON	Cycle	5am-4pm	ON	Cycle
Holiday	5am-7pm	ON	Cycle	5am-4pm	ON	Cycle

Meadowbrook Elementary -Energy Management System Schedules

Meadowbrook Elementary School – Administration - Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-5pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-5pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday – Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Meadowbrook Elementary School – Classroom - Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday – Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Meadowbrook Elementary School -Multi-Purpose Room - Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday-Sunday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F
Holiday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F

Meadowbrook Elementary School - Administration - Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday – Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Meadowbrook Elementary School - Classroom - Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday – Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Meadowbrook Elementary School – Multi-Purpose Room - Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday-Sunday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle
Holiday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle

Meadowbrook Elementary School - DCV Schedule - Administration + Classroom (RTU-1-4) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	5% of SA CFM	7am-6pm	Design OA	5% of SA CFM
Friday	7am-6pm	Design OA	5% of SA CFM	7am-6pm	Design OA	5% of SA CFM
Saturday – Sunday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM
Holiday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM

Meadowbrook Elementary School - DCV Schedule - Multi-Purpose Room (RTU-5-6) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Friday	7am-6pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Saturday – Sunday	7am-4pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Holiday	7am-4pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM

Margaret L Vetter Elementary – Baseline Schedules

Vetter Elementary – Administration + Classroom Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday – Sunday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Holiday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F

Vetter Elementary School – Multi-Purpose Room - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Friday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-9pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday-Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Vetter Elementary School - Administration +Classroom Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday – Sunday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle
Holiday	5am-9pm	ON	Cycle	5am-4pm	ON	Cycle

Vetter Elementary School – Multi-Purpose Room - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Friday	5am-9pm	ON	Cycle	5am-9pm	ON	Cycle
Saturday-Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Vetter Elementary School - DCV Schedule - Administration + Classroom (RTU-1-2 Only) - (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	15% of SA CFM	7am-6pm	Design OA	15% of SA CFM
Friday	7am-6pm	Design OA	15% of SA CFM	7am-6pm	Design OA	15% of SA CFM
Saturday – Sunday	N/A	N/A	15% of SA CFM	N/A	N/A	15% of SA CFM
Holiday	N/A	N/A	15% of SA CFM	N/A	N/A	15% of SA CFM

Margaret L Vetter Elementary – Energy Management System Schedules

Vetter Elementary School – Administration + Classroom Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday – Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Vetter Elementary School – Multi-Purpose Room - Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Friday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday-Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Vetter Elementary School - Administration + Classroom Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday – Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Vetter Elementary School – Multi-Purpose Room - Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Friday	5am-6pm	ON	Cycle	5am-4pm	ON	Cycle
Saturday-Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Vetter Elementary School - DCV Schedule - Administration + Classroom (RTU-1-2) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	5% of SA CFM	7am-6pm	Design OA	5% of SA CFM
Friday	7am-6pm	Design OA	5% of SA CFM	7am-6pm	Design OA	5% of SA CFM
Saturday – Sunday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM
Holiday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM

Vetter Elementary School - DCV Schedule - Multi-Purpose Room (RTU-3) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-6pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Friday	7am-6pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Saturday – Sunday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM
Holiday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM

Woodmere Elementary – Baseline Schedules

Woodmere Elementary School – Administration + Classroom - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Friday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F
Saturday	7am-9am	70F/72F	65F/80F	7am-9am	70F/72F	65F/80F
Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Woodmere Elementary School – Multi-Purpose Room - Temperature Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Friday	7am-4pm	70F/72F	65F/80F	7am-4pm	70F/72F	65F/80F
Saturday	7am-9am	70F/72F	65F/80F	7am-9am	70F/72F	65F/80F
Sunday	6am-8pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F
Holiday	6am-8pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F

Woodmere Elementary School – Administration + Classroom - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Friday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle
Saturday	7am-9am	ON	Cycle	7am-9am	ON	Cycle
Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Woodmere Elementary School – Multi-Purpose Room - Fan Schedule (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Friday	7am-4pm	ON	Cycle	7am-4pm	ON	Cycle
Saturday	7am-9am	ON	Cycle	7am-9am	ON	Cycle
Sunday	6am-8pm	ON	Cycle	6am-4pm	ON	Cycle
Holiday	6am-8pm	ON	Cycle	6am-4pm	ON	Cycle

Woodmere Elementary School - DCV Schedule - Administration + Classroom (RTU-1-4) - (Baseline)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-4pm	Design OA	15% of SA CFM	7am-4pm	Design OA	15% of SA CFM
Friday	7am-4pm	Design OA	15% of SA CFM	7am-4pm	Design OA	15% of SA CFM
Saturday – Sunday	N/A	N/A	15% of SA CFM	N/A	N/A	15% of SA CFM
Holiday	N/A	N/A	15% of SA CFM	N/A	N/A	15% of SA CFM

Woodmere Elementary School – Energy Management System Schedules

Woodmere Elementary School – Administration + Classroom - Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Thursday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F
Friday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F
Saturday – Sunday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Holiday	N/A	N/A	65F/80F	N/A	N/A	65F/80F

Woodmere Elementary School – Multi-Purpose Room - Temperature Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint	Occ Hrs	Occ Heat/Cool Setpoint	Unocc Heat/Cool Setpoint
Monday-Friday	5am-6pm	70F/72F	65F/80F	5am-4pm	70F/72F	65F/80F
Saturday	N/A	N/A	65F/80F	N/A	N/A	65F/80F
Sunday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F
Holiday	6am-4pm	70F/72F	65F/80F	6am-4pm	70F/72F	65F/80F

Woodmere Elementary School - Administration + Classroom - Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Thursday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle
Friday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle
Saturday – Sunday	N/A	N/A	Cycle	N/A	N/A	Cycle
Holiday	N/A	N/A	Cycle	N/A	N/A	Cycle

Woodmere Elementary School – Multi-Purpose Room - Fan Schedule (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint	Occ Hrs	Occ Fan Setpoint	Unocc Fan Setpoint
Monday-Friday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle
Saturday	N/A	N/A	Cycle	N/A	N/A	Cycle
Sunday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle
Holiday	6am-4pm	ON	Cycle	6am-4pm	ON	Cycle

Woodmere Elementary School - DCV Schedule - Administration + Classroom (RTU-1-4) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Thursday	7am-4pm	Design OA	5% of SA CFM	7am-4pm	Design OA	5% of SA CFM
Friday	7am-4pm	Design OA	5% of SA CFM	7am-4pm	Design OA	5% of SA CFM
Saturday – Sunday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM
Holiday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM

Woodmere Elementary School - DCV Schedule - Multi-Purpose Room (RTU-5-6) - (EMS)						
	School Year - 1/1 to 6/18, 9/4 to 12/31			Summer – 6/19 to 9/3		
	Occ Hrs	Occ OA	Unocc OA	Occ Hrs	Occ OA	Unocc OA
Monday-Friday	7am-4pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Saturday	N/A	N/A	5% of SA CFM	N/A	N/A	5% of SA CFM
Sunday	7am-4pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM
Holiday	7am-4pm	Design OA	5% of SA CFM	8am-3pm	Design OA	5% of SA CFM