ENERGY SAVINGS PLAN

SUBMITTED BY:
DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648
BPU Submission
6/20/2023

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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 the Casino Reinvestment Development Authority (CRDA) 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 the CRDA with the necessary information to decide which proposed ECMs to implement as part of your (ESIP) project. Working with the CRDA Administration, your selected ESIP project would:

1. Self-fund a $67,572,065 project
2. Generate $3,702,103 in annual energy savings
3. Eligible for $212,700 in Prescriptive Lighting Rebates through Atlantic City Electric
4. Qualifies for $8,887,189 in Solar Investment Tax Credits

NOTES:

- This submitted ESP doesn't constitute any contractual obligation between the CRDA and DCO Energy (DCO). Any contractual obligations will be performed under separate legal documents per mutually signed agreement of the parties involved and subject to the applicable laws and requirements of the ESIP legislation and State of New Jersey.
- The Casino Reinvestment Development Authority is using the ESCO Model for their ESIP project.
- The financial advisor for CRDA is Phoenix Advisors.
- 3rd Party Review and Approval of the Energy Savings Plan was conducted by DLB Associates.

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 H)*
- *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 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 the CRDA's approval of the Energy Savings Plan to implement via the requirements of the ESIP legislation. Your time, effort, and support are appreciated.

ENERGY SAVINGS PLAN

SECTION 2 – CRDA ENERGY BASELINE

Total Utility Consumption

The Casino Reinvestment Development Authority's Energy Savings Plan includes 4 buildings. The Atlantic City Convention Center, Boardwalk Hall/West Hall, WAVE Parking Garage, CRDA Offices. To develop the ESP, DCO Energy was provided with the necessary utility data (Chilled Water, Steam, Hot Water, Electric, Natural Gas & Solar). DCO Energy documented this utility data and established the baseline period of January 2022 through December 2023. A listing of the buildings and the total utility consumption for the 4 sites are detailed below.

BUILDINGS & FACILITIES					
BUILDING #	BUILDING/FACILITY NAME	ADDRESS			SQFT
		STREET	STATE	ZIP	
1	Atlantic City Convention Center	1 Convention Boulevad, Atlantic City	NJ	08401	1,100,000
2	Boardwalk & West Hall	2301 Boardwalk, Atlantic City	NJ	08401	753,713
3	WAVE Parking Garage	2200 Fairmount Avenue, Atlantic City	NJ	08401	411,690
4	CRDA Office	15 S. Pennsylvalia Avenue, Atlantic City	NJ	08401	13,200

CRDA - Energy Use Summary

CASINO REINVESTMENT DEVELOPMENT AUTHORITY BUILDINGS/FACILITIES		UTILITY ELECTRIC			
BUILDING/FACILITY NAME	SQFT	CONSUMPTION kWh	DEMAND kW	USAGE BTU / SQFT	TOTAL COST $$
Atlantic City Convention Center	1,100,000	12,467,607	3,313	38,672	$2,002,133
Boardwalk & West Hall	753,713	7,036,063	1,445	31,852	$1,056,990
WAVE Parking Garage	411,690	411,200	180	3,408	$69,748
CRDA Office	13,200	193,429	60	49,998	$39,070
TOTALS	**2,278,603**	**20,108,299**	**3,313**	**30,110**	**$3,167,941**

CASINO REINVESTMENT DEVELOPMENT AUTHORITY BUILDINGS/FACILITIES		NATURAL GAS			
BUILDING/FACILITY NAME	SQFT	USAGE THERMS	USAGE BTU / SQFT	TOTAL COST $$	BLENDED COST $$ / THERM
Atlantic City Convention Center	1,100,000	11,314	1,029	$20,869	$1.84
Boardwalk & West Hall	753,713	0	0	$0	-
WAVE Parking Garage	411,690	0	0	$424	-
CRDA Office	13,200	2,607	19,748	$3,638	$1.40
TOTALS	**2,278,603**	**13,920**	**611**	**$24,931**	**$1.79**

CASINO REINVESTMENT DEVELOPMENT AUTHORITYBUILDINGS/FACILITIES		SOLAR PPA (kWh)			
BUILDING/FACILITY NAME	SQFT	USAGE SOLAR PPA (kWh)	USAGE BTU / SQFT	TOTAL COST $$	UNIT COST $$ /
Atlantic City Convention Center	1,100,000	3,102,051	9,622	$602,573	$0.194
Boardwalk & West Hall	753,713	0	0	$0	-
WAVE Parking Garage	411,690	552,918	4,582	$0	$0.00
CRDA Office	13,200	0	0	$0	-
TOTALS	**2,278,603**	**4,207,751**	**6,301**	**$602,573**	**$0.14**

CASINO REINVESTMENT DEVELOPMENT AUTHORITYBUILDINGS/FACILITIES		CHILLED WATER (Tons/Hr)			
BUILDING/FACILITY NAME	SQFT	USAGE	USAGE BTU / SQFT	TOTAL COST $$	UNIT COST $$ /
Atlantic City Convention Center	1,100,000	1,018,656	11,113	$931,578	$0.91
Boardwalk & West Hall	753,713	2,187,777	34,832	$464,207	$0.21
WAVE Parking Garage	411,690	0	0	$0	-
CRDA Office	13,200	0	0	$0	-
TOTALS	**2,278,603**	**3,206,433**	**16,886**	**$1,395,785**	**$0.44**

CASINO REINVESTMENT DEVELOPMENT AUTHORITYBUILDINGS/FACILITIES		STEAM/HW (MMBTU)			
BUILDING/FACILITY NAME	SQFT	USAGE	USAGE BTU / SQFT	TOTAL COST $$	UNIT COST $$ /
Atlantic City Convention Center	1,100,000	11,559	10,508.36	$1,029,794	$89.0887
Boardwalk & West Hall	753,713	50,134	66,516.57	$764,204	$15.2431
WAVE Parking Garage	411,690	0	0.00	$0	-
CRDA Office	13,200	0	0.00	$0	-
TOTALS	**2,278,603**	**61,694**	**27,075.19**	**$1,793,998**	**$29.0792**

DCO Energy Efficiency Division
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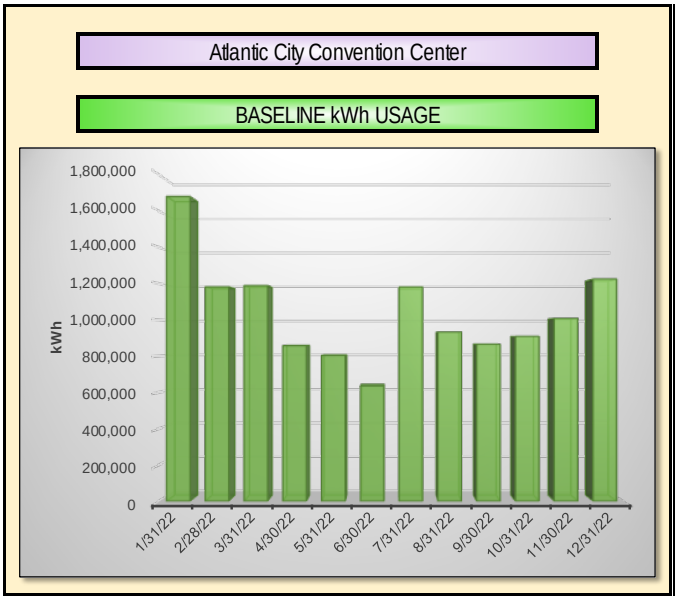
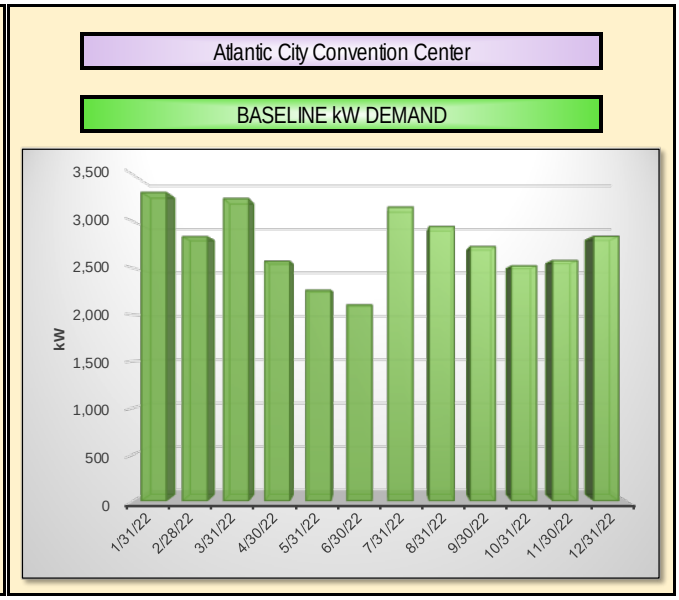
Atlantic City Convention Center - Baseline Energy Use

Atlantic City Convention Center						ELECTRIC METER #1						
Provider:	AC Elec.			Account #	5500 3541 962				Meter #	KZD388782540		
Commodity:				Account #					Meter #	KZD388782558		
Billing Period Start Date	Actual Reading	Net Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
1/1/22	**1/31/22**	**1,492,119**	**3,313**	**$40,966**	**$168,529**	**$32,724**	$136	$242,356	$0.162	31	61%	5,091,110,028
2/1/22	**2/28/22**	**1,049,769**	**2,837**	**$28,821**	**$68,916**	**$25,342**	$123	$123,202	$0.117	28	55%	3,581,811,828
3/1/22	**3/31/22**	**1,065,245**	**3,247**	**$29,586**	**$68,028**	**$32,101**	$136	$129,851	$0.122	31	44%	3,634,615,940
4/1/22	**4/30/22**	**749,333**	**2,574**	**$20,688**	**$61,269**	**$24,781**	$132	$106,870	$0.143	30	40%	2,556,724,196
5/1/22	**5/31/22**	**698,515**	**2,262**	**$19,401**	**$61,091**	**$22,476**	$136	$103,104	$0.148	31	42%	2,383,333,180
6/1/22	**6/30/22**	**508,246**	**2,105**	**$11,579**	**$52,736**	**$20,232**	$132	$84,679	$0.167	30	34%	1,734,135,352
7/1/22	**7/31/22**	**1,053,612**	**3,154**	**$24,451**	**$122,696**	**$31,346**	$136	$178,629	$0.170	31	45%	3,594,924,144
8/1/22	**8/31/22**	**795,215**	**2,946**	**$18,456**	**$108,042**	**$29,255**	$135	$155,888	$0.196	31	36%	2,713,273,580
9/1/22	**9/30/22**	**747,328**	**2,731**	**$17,664**	**$71,428**	**$29,393**	$132	$118,616	$0.159	30	38%	2,549,883,136
10/1/22	**10/31/22**	**787,572**	**2,523**	**$18,182**	**$69,657**	**$28,097**	$136	$116,072	$0.147	31	42%	2,687,195,664
11/1/22	**11/30/22**	**890,771**	**2,580**	**$20,564**	**$74,925**	**$27,814**	$132	$123,435	$0.139	30	48%	3,039,310,652
12/1/22	**12/31/22**	**1,085,860**	**2,840**	**$25,068**	**$200,839**	**$31,642**	$136	$257,685	$0.237	31	51%	3,704,954,320
TOTALS		10,923,585	3,313	$275,426	$1,128,155	$335,203	$1,602	$1,740,386	$0.159	365	38%	37,271,272,020

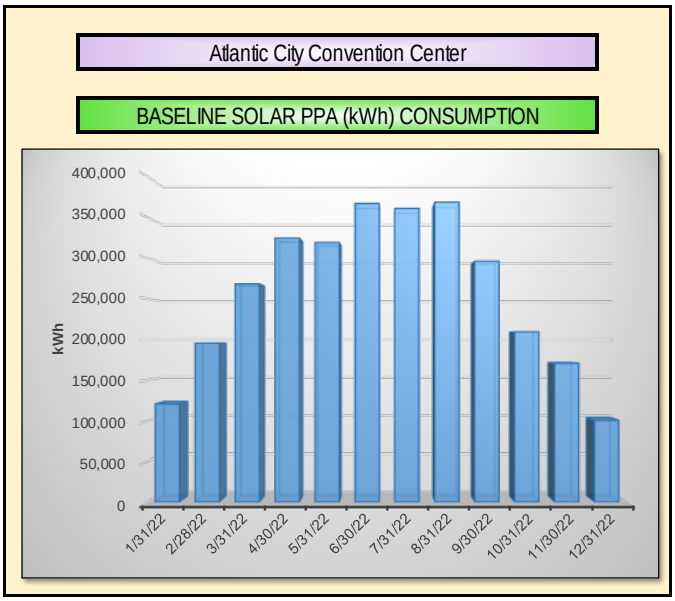
Atlantic City Convention Center						ELECTRIC METER #2						
Provider:	AC Elec.			Account #	5500 3541 517				Meter #	KZD386461112		
Commodity:				Account #					Meter #	KZD386461118		
Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
1/1/22	**1/31/22**	187,549	415	$5,149	$23,467	$4,106	$136	$32,858	0.18	31	61%	639,917,188
2/1/22	**2/28/22**	132,233	430	$3,630	$10,202	$3,841	$123	$17,797	0.13	28	46%	451,178,996
3/1/22	**3/31/22**	123,930	397	$3,442	$9,394	$3,923	$136	$16,894	0.14	31	42%	422,849,160
4/1/22	**4/30/22**	108,281	397	$3,007	$10,001	$3,804	$132	$16,944	0.16	30	38%	369,454,772
5/1/22	**5/31/22**	105,509	397	$2,973	$10,655	$3,931	$136	$17,696	0.17	31	36%	359,996,708
6/1/22	**6/30/22**	126,778	397	$2,965	$14,328	$3,804	$132	$21,229	0.17	30	44%	432,566,536
7/1/22	**7/31/22**	127,390	397	$3,004	$15,927	$3,931	$136	$22,998	0.18	31	43%	434,654,680
8/1/22	**8/31/22**	137,734	397	$3,263	$20,210	$3,931	$136	$27,539	0.20	31	47%	469,948,408
9/1/22	**9/30/22**	117,817	397	$2,840	$12,180	$4,260	$132	$19,412	0.16	30	41%	401,991,604
10/1/22	**10/31/22**	120,934	286	$2,831	$11,444	$3,182	$136	$17,593	0.15	31	57%	412,626,808
11/1/22	**11/30/22**	117,128	350	$2,714	$10,790	$3,762	$132	$17,397	0.15	30	46%	399,640,736
12/1/22	**12/31/22**	138,739	366	$3,214	$25,970	$4,068	$136	$33,389	0.24	31	51%	473,377,468
TOTALS		1,544,022	430	$39,033	$174,568	$46,543	$1,603	$261,747	0.17	365	41%	5,268,203,064

Atlantic City Convention Center												
TOTAL ELECTRIC												
Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kW Checksum	Cost / kWh Checksum	Total Cost / kWh Checksum	Days	Load Factor	BTU
1,679,668	3,313	$46,115	$191,996	$36,830	$272	$275,214	$11.12	$0.142	$0.164	31	68%	5,731,027,216
1,182,002	2,837	$32,452	$79,118	$29,183	$246	$140,999	$10.29	$0.094	$0.119	28	62%	4,032,990,824
1,189,175	3,247	$33,028	$77,421	$36,024	$272	$146,745	$11.09	$0.093	$0.123	31	49%	4,057,465,100
857,614	2,574	$23,695	$71,270	$28,586	$264	$123,814	$11.11	$0.111	$0.144	30	46%	2,926,178,968
804,024	2,262	$22,374	$71,746	$26,407	$272	$120,799	$11.67	$0.117	$0.150	31	48%	2,743,329,888
635,024	2,105	$14,544	$67,064	$24,036	$264	$105,908	$11.42	$0.129	$0.167	30	42%	2,166,701,888
1,181,002	3,154	$27,455	$138,623	$35,277	$272	$201,627	$11.18	$0.141	$0.171	31	50%	4,029,578,824
932,949	2,946	$21,718	$128,252	$33,186	$271	$183,428	$11.27	$0.161	$0.197	31	43%	3,183,221,988
865,145	2,731	$20,504	$83,608	$33,653	$264	$138,028	$12.32	$0.120	$0.160	30	44%	2,951,874,740
908,506	2,523	$21,013	$81,100	$31,279	$272	$133,665	$12.40	$0.112	$0.147	31	48%	3,099,822,472
1,007,899	2,580	$23,278	$85,715	$31,576	$264	$140,832	$12.24	$0.108	$0.140	30	54%	3,438,951,388
1,224,599	2,840	$28,283	$226,809	$35,711	$272	$291,075	$12.57	$0.208	$0.238	31	58%	4,178,331,788
12,467,607	3,313	$314,459	$1,302,723	$381,746	$3,205	$2,002,133	$11.56	$0.130	$0.161	365	43%	42,539,475,084

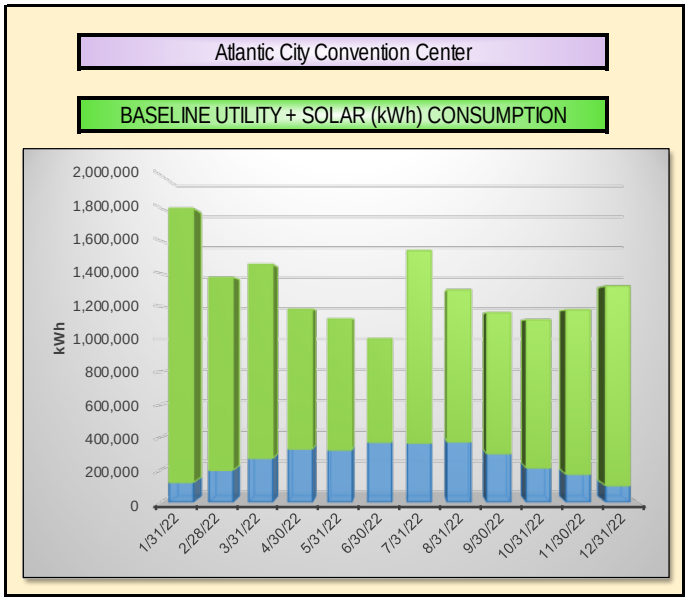




Atlantic City Convention Center					
Provider	Luminace		SOLAR PPA (kWh)		
Meter/Acct #	NJ-21-C328				
Billing Period Start Date	Actual Reading	SOLAR PPA (kWh)	$$	Cost / Unit Checksum	BTU
1/1/22	1/31/22	120,670	$23,437	$0.194	411,726,040
2/1/22	2/28/22	195,480	$37,966	$0.194	666,977,760
3/1/22	3/31/22	268,219	$52,093	$0.194	915,163,228
4/1/22	4/30/22	324,663	$63,056	$0.194	1,107,750,156
5/1/22	5/31/22	319,239	$62,003	$0.194	1,089,243,468
6/1/22	6/30/22	367,219	$71,321	$0.194	1,252,951,228
7/1/22	7/31/22	361,121	$70,137	$0.194	1,232,144,852
8/1/22	8/31/22	368,600	$71,589	$0.194	1,257,663,200
9/1/22	9/30/22	296,214	$57,531	$0.194	1,010,682,168
10/1/22	10/31/22	209,413	$40,672	$0.194	714,517,156
11/1/22	11/30/22	170,611	$33,136	$0.194	582,124,732
12/1/22	12/31/22	100,602	$19,631	$0.195	343,254,024
TOTALS		3,102,051	$602,573	$0.194	10,584,198,012



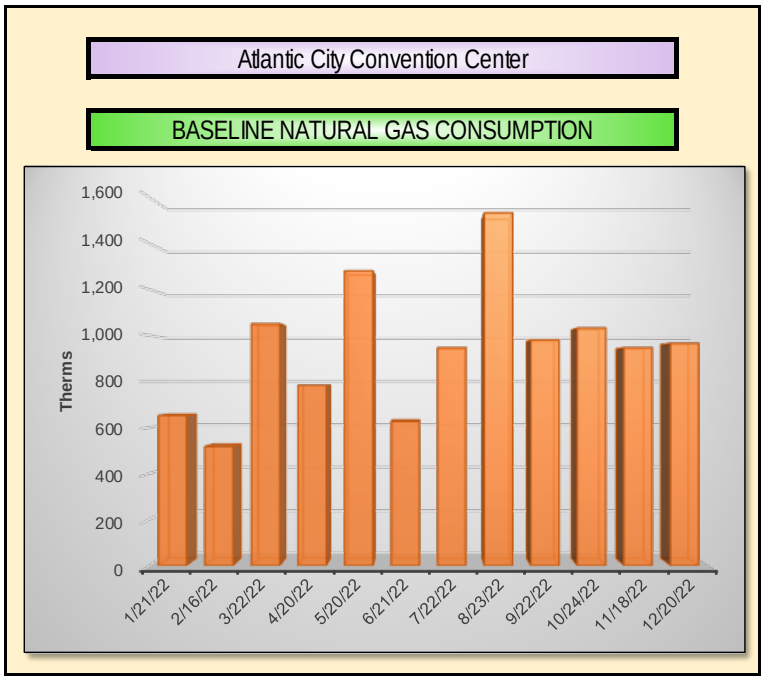
CASINO REINVESTMENT DEVELOPMENT AUTHORITY		UTILITY + SOLAR ELECTRIC CONSUMPTION		
BUILDING/FACILITY NAME	SQFT	USAGE kWh	USAGE BTU / SQFT	TOTAL COST $$
Atlantic City Convention Center	1,100,000	15,569,658	4,563	$2,604,706



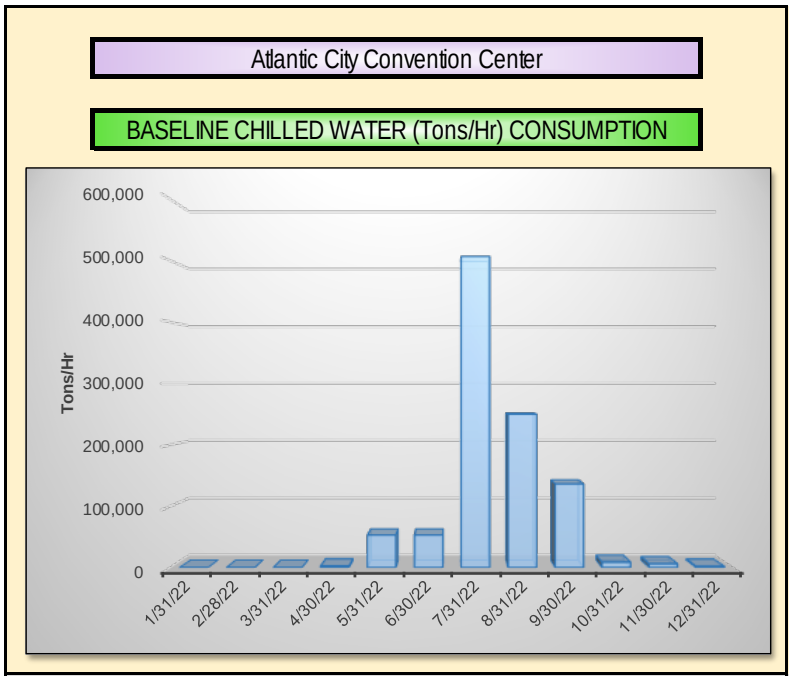
Atlantic City Convention Center						Natural Gas Meter #1		
Provider	SJG		Account #	8568200000		Meter #	0669240	
Commodity			Account #			Meter #		
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Commodity Charges	Fixed Customer Charge	Gas Total Charges	Cost/Therm Checksum	BTU
12/20/21	1/21/22	176	$163	$88	$40	$291	$1.43	17,561,000
1/22/22	2/16/22	62	$58	$31	$32	$121	$1.44	6,204,000
2/17/22	3/22/22	217	$203	$109	$42	$354	$1.44	21,714,000
3/23/22	4/20/22	145	$136	$73	$36	$244	$1.44	14,462,000
4/21/22	5/20/22	289	$271	$145	$37	$454	$1.44	28,868,000
5/21/22	6/21/22	103	$97	$52	$40	$188	$1.44	10,300,000
6/22/22	7/22/22	165	$155	$83	$38	$276	$1.44	16,464,000
7/23/22	8/23/22	350	$330	$176	$40	$545	$1.44	35,020,000
8/24/22	9/22/22	103	$97	$52	$37	$186	$1.44	10,310,000
9/23/22	10/24/22	196	$186	$140	$40	$365	$1.67	19,570,000
10/25/22	11/18/22	165	$157	$129	$31	$317	$1.74	16,464,000
11/19/22	12/20/22	124	$118	$97	$40	$255	$1.74	12,384,000
TOTALS		2,093	$1,971	$1,175	$451	$3,597	$1.50	209,321,000

Atlantic City Convention Center						Natural Gas Meter #2		
Provider	SJG		Account #	9568200000		Meter #	0766528	
Commodity			Account #			Meter #	0766456	
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Commodity Charges	Fixed Customer Charge	Gas Total Charges	Cost/Therm Checksum	BTU
12/20/21	1/21/22	476	$443	$297	$40	$779	$1.64	47,622,000
1/22/22	2/16/22	455	$425	$329	$32	$786	$1.73	45,496,000
2/17/22	3/22/22	833	$779	$583	$42	$1,403	$1.68	83,341,000
3/23/22	4/20/22	638	$599	$437	$36	$1,072	$1.68	63,840,000
4/21/22	5/20/22	992	$932	$841	$37	$1,811	$1.83	99,183,000
5/21/22	6/21/22	523	$492	$553	$40	$1,084	$2.07	52,324,000
6/22/22	7/22/22	782	$736	$737	$38	$1,512	$1.93	78,204,000
7/23/22	8/23/22	1182	$1,113	$1,308	$40	$2,461	$2.08	118,244,000
8/24/22	9/22/22	877	$826	$1,022	$37	$1,885	$2.15	87,738,000
9/23/22	10/24/22	836	$795	$777	$40	$1,611	$1.93	83,636,000
10/25/22	11/18/22	782	$745	$567	$31	$1,343	$1.72	78,204,000
11/19/22	12/20/22	842	$803	$681	$40	$1,523	$1.81	84,212,000
TOTALS		9,220	$8,688	$8,133	$451	$17,272	$1.87	922,044,000

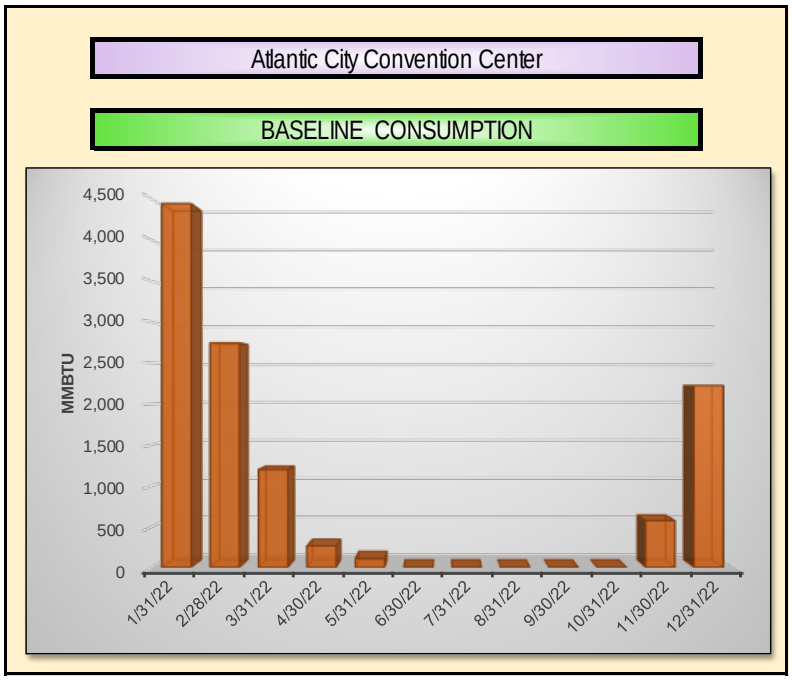
Atlantic City Convention Center						
TOTAL NATURAL GAS						
Therms	Gas Delivery Charges	Gas Commodity Charges	Fixed Customer Charge	Gas Total Charges	Cost/Therm Checksum	BTU
652	$606	$385	$79	$1,070	$1.52	65,183,000
517	$483	$360	$64	$908	$1.63	51,700,000
1,051	$982	$692	$84	$1,757	$1.59	105,055,000
783	$735	$510	$72	$1,316	$1.59	78,302,000
1,281	$1,204	$986	$74	$2,264	$1.71	128,051,000
626	$589	$604	$79	$1,273	$1.91	62,624,000
947	$891	$820	$77	$1,788	$1.81	94,668,000
1,533	$1,443	$1,484	$79	$3,006	$1.91	153,264,000
980	$923	$1,074	$74	$2,071	$2.04	98,048,000
1,032	$981	$917	$79	$1,977	$1.84	103,206,000
947	$902	$697	$62	$1,661	$1.69	94,668,000
966	$921	$778	$79	$1,778	$1.76	96,596,000
11,314	$10,659	$9,309	$902	$20,869	$1.76	1,131,365,000



Atlantic City Convention Center						
Provider	ACM Energy Partners, LLC		CHILLED WATER (Tons/Hr)			
Meter/Acct #						
Billing Period Start Date	Actual Reading	CHILLED WATER (Tons/Hr)	$$	Fixed Capacity Charge	Cost / Unit Checksum	BTU
1/1/22	1/31/22	0	$0	$26,043	$0.00	0
2/1/22	2/28/22	0	$0	$26,043	$0.00	0
3/1/22	3/31/22	0	$0	$26,043	$0.00	0
4/1/22	4/30/22	2,675	$1,849	$26,043	$0.69	32,100,000
5/1/22	5/31/22	52,975	$36,624	$26,043	$0.69	635,700,000
6/1/22	6/30/22	52,986	$36,632	$26,043	$0.69	635,832,000
7/1/22	7/31/22	506,962	$302,921	$26,043	$0.60	6,083,544,000
8/1/22	8/31/22	249,821	$149,273	$26,043	$0.60	2,997,852,000
9/1/22	9/30/22	136,236	$81,404	$26,043	$0.60	1,634,832,000
10/1/22	10/31/22	8,753	$5,334	$26,043	$0.61	105,036,000
11/1/22	11/30/22	6,207	$3,782	$26,043	$0.61	74,484,000
12/1/22	12/31/22	2,041	$1,244	$26,043	$0.61	24,492,000
TOTALS		1,018,656	$619,063	$312,515	$0.608	12,223,872,000



Atlantic City Convention Center						
Provider	ACM Energy Partners, LLC		STEAM/HW (MMBTU)			
Acct #						
Billing Period Start Date	Actual Reading	STEAM/HW (MMBTU)	$$	Fixed Capacity Charge	Cost / Unit Checksum	BTU
1/1/22	1/31/22	4,449	$346,960	$11,874	$77.98	4,449,200,000
2/1/22	2/28/22	2,747	$214,187	$11,874	$77.98	2,746,600,000
3/1/22	3/31/22	1,197	$93,345	$11,874	$77.98	1,197,000,000
4/1/22	4/30/22	262	$20,453	$11,874	$78.03	262,100,000
5/1/22	5/31/22	108	$8,436	$11,874	$78.03	108,100,000
6/1/22	6/30/22	0	$0	$11,874	$0.00	0
7/1/22	7/31/22	0	$0	$11,874	$0.00	0
8/1/22	8/31/22	0	$0	$11,874	$0.00	0
9/1/22	9/30/22	0	$0	$11,874	$0.00	0
10/1/22	10/31/22	0	$0	$11,874	$0.00	0
11/1/22	11/30/22	572	$44,693	$11,874	$78.11	572,200,000
12/1/22	12/31/22	2,224	$159,236	$11,874	$71.60	2,224,000,000
TOTALS		11,559	$887,309	$142,485	$76.76	11,559,200,000



DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648

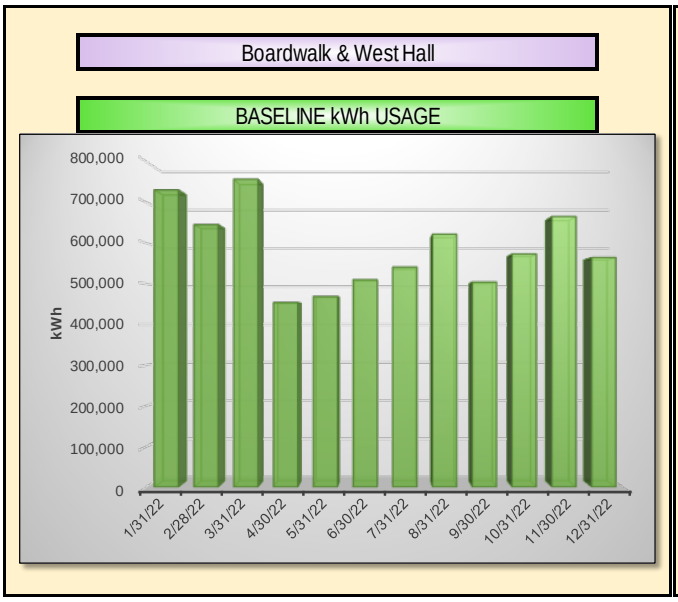
Boardwalk & West Hall - Baseline Energy Use

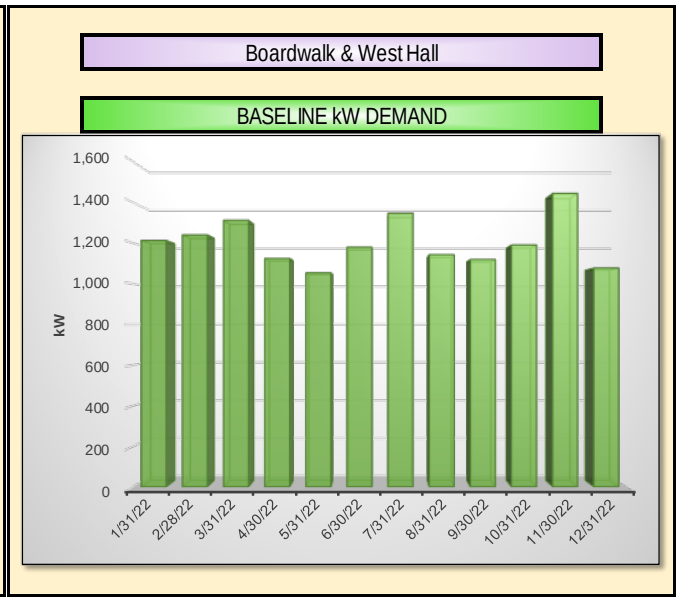
Boardwalk & West Hall						ELECTRIC METER #1						
Provider:	AC Elec.			Account #	5500 6996 619				Meter #	KZD386461096		
Commodity:				Account #					Meter #	KZD386461101		
Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
1/1/22	**1/31/22**	597,686	1,213	$16,409	$68,189	$12,467	$136	$97,202	$0.163	31	66%	2,039,304,632
2/1/22	**2/28/22**	538,452	1,240	$14,783	$36,850	$11,482	$123	$63,237	$0.117	28	65%	1,837,198,224
3/1/22	**3/31/22**	662,959	1,313	$18,423	$42,838	$13,371	$136	$74,768	$0.113	31	68%	2,262,016,108
4/1/22	**4/30/22**	444,667	1,125	$12,350	$37,330	$11,154	$132	$60,966	$0.137	30	55%	1,517,203,804
5/1/22	**5/31/22**	441,843	1,054	$12,308	$41,186	$10,869	$136	$64,499	$0.146	31	56%	1,507,568,316
6/1/22	**6/30/22**	450,704	1,180	$10,326	$52,886	$11,700	$132	$75,044	$0.167	30	53%	1,537,802,048
7/1/22	**7/31/22**	472,779	1,347	$11,011	$59,356	$13,823	$136	$84,326	$0.178	31	47%	1,613,121,948
8/1/22	**8/31/22**	535,271	1,143	$12,466	$81,224	$11,715	$136	$105,542	$0.197	31	63%	1,826,344,652
9/1/22	**9/30/22**	443,872	1,120	$10,528	$45,561	$12,439	$132	$68,660	$0.155	30	55%	1,514,491,264
10/1/22	**10/31/22**	503,790	1,191	$11,672	$46,399	$13,627	$136	$71,835	$0.143	31	57%	1,718,931,480
11/1/22	**11/30/22**	594,259	1,445	$13,849	$48,558	$15,877	$132	$78,415	$0.132	30	57%	2,027,611,708
12/1/22	**12/31/22**	509,319	1,078	$11,800	$84,054	$12,356	$136	$108,347	$0.213	31	64%	1,737,796,428
TOTALS		6,195,601	1445	$155,928	$644,431	$150,880	$1,603	$952,842	$0.154	365	49%	21,139,390,612

Boardwalk & West Hall						ELECTRIC METER #2						
Provider:	AC Elec.			Account #	5500 7089 505				Meter #	KZD386401084		
Commodity:				Account #					Meter #			
Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
1/1/22	**1/31/22**	133,089	278	$3,433	$9,395	$5,226	$206	$18,260	0.14	31	64%	454,099,668
2/1/22	**2/28/22**	106,890	238	$2,757	$7,548	$3,923	$180	$14,408	0.13	28	67%	364,708,680
3/1/22	**3/31/22**	94,349	226	$2,463	$6,663	$4,125	$200	$13,450	0.14	31	56%	321,918,788
4/1/22	**4/30/22**	9,292	216	$243	$650	$3,715	$187	$4,795	0.52	30	6%	31,704,304
5/1/22	**5/16/22**	0	216	$1,637	$669	$0	$116	$2,422	$0.00	16	0%	0
5/17/22								$0	$0.00		$0.00	0
1/1/00								$0	$0.00		$0.00	0
1/1/00								$0	$0.00		$0.00	0
1/1/00								$0	$0.00		$0.00	0
1/1/00								$0	$0.00		$0.00	0
1/1/00								$0	$0.00		$0.00	0
1/1/00								$0	$0.00		$0.00	0
TOTALS		343,620	278	$10,532	$24,925	$16,989	$889	$53,335	0.16	136	38%	1,172,431,440

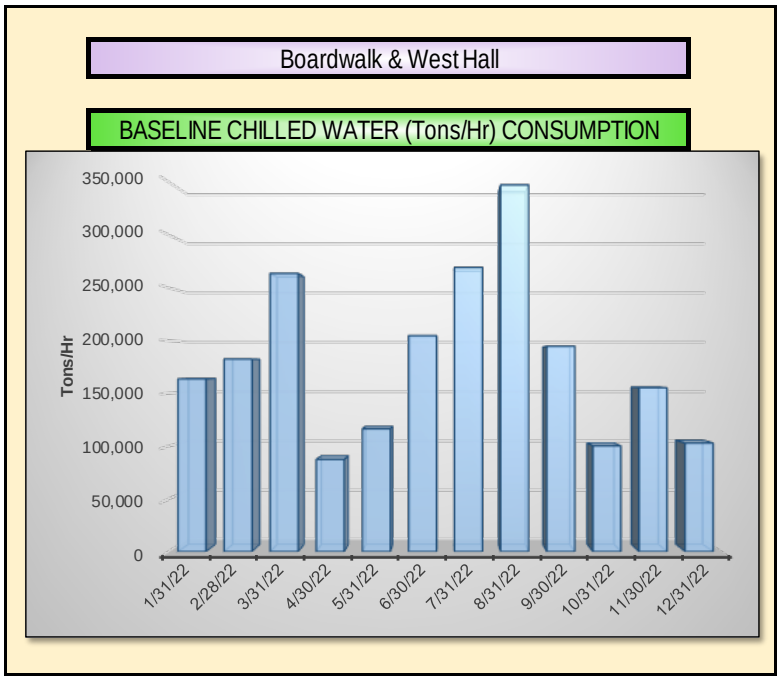
Boardwalk & West Hall						ELECTRIC METER #3						
Provider:	AC Elec.			Account #	5503 2049 938				Meter #	KZD386401047		
Commodity:				Account #					Meter #			
Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
								$0	$0.00	1	$0.00	0
1/1/00								$0	$0.00	0	$0.00	0
1/1/00								$0	$0.00	0	$0.00	0
1/1/00								$0	$0.00	0	$0.00	0
5/17/22	**5/30/22**	26,883	128	$749	$1,345	$571	$61	$2,727	$0.10	14	63%	91,724,796
5/31/22	**6/29/22**	59,446	159	$1,372	$3,042	$1,528	$132	$6,074	$0.10	30	52%	202,829,752
6/30/22	**7/31/22**	68,100	173	$1,585	$3,488	$1,602	$127	$6,802	$0.10	32	51%	232,357,200
8/1/22	**8/31/22**	86,527	195	$2,015	$4,432	$2,056	$145	$8,648	$0.10	31	60%	295,230,124
9/1/22	**9/29/22**	60,185	161	$1,427	$3,084	$1,726	$132	$6,368	$0.11	29	54%	205,351,220
9/30/22	**10/30/22**	69,363	173	$1,608	$3,422	$1,919	$136	$7,085	$0.10	31	54%	236,666,556
10/31/22	**11/30/22**	71,046	159	$1,646	$3,500	$1,713	$132	$6,991	$0.10	31	60%	242,408,952
12/1/22	**12/29/22**	55,292	184	$1,281	$2,724	$1,981	$132	$6,118	$0.11	29	43%	188,656,304
TOTALS		496842	195	$11,683	$25,036	$13,097	$997	$50,813	$0.10	228	47%	1,695,224,904

Boardwalk & West Hall												
TOTAL ELECTRIC												
Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kW Checksum	Cost / kWh Checksum	Total Cost / kWh Checksum	Days	Load Factor	BTU
730,775	1,213	$19,842	$77,584	$17,693	$342	$115,461	$14.58	$0.133	$0.158	31	81%	2,493,404,300
645,342	1,240	$17,540	$44,398	$15,404	$303	$77,646	$12.42	$0.096	$0.120	28	77%	2,201,906,904
757,308	1,313	$20,886	$49,500	$17,497	$336	$88,218	$13.33	$0.093	$0.116	31	78%	2,583,934,896
453,959	1,125	$12,593	$37,980	$14,869	$319	$65,760	$13.22	$0.111	$0.145	30	56%	1,548,908,108
468,726	1,054	$14,695	$43,199	$11,440	$314	$69,648	$10.85	$0.124	$0.149	31	60%	1,599,293,112
510,150	1,180	$11,698	$55,929	$13,228	$264	$81,118	$11.21	$0.133	$0.159	30	60%	1,740,631,800
540,879	1,347	$12,596	$62,844	$15,425	$264	$91,128	$11.45	$0.139	$0.168	31	54%	1,845,479,148
621,798	1,143	$14,482	$85,656	$13,771	$281	$114,190	$12.04	$0.161	$0.184	31	73%	2,121,574,776
504,057	1,120	$11,955	$48,645	$14,165	$264	$75,028	$12.65	$0.120	$0.149	30	63%	1,719,842,484
573,153	1,191	$13,281	$49,821	$15,547	$272	$78,920	$13.05	$0.110	$0.138	31	65%	1,955,598,036
665,305	1,445	$15,495	$52,058	$17,590	$264	$85,406	$12.17	$0.102	$0.128	30	64%	2,270,020,660
564,611	1,078	$13,081	$86,778	$14,338	$268	$114,465	$13.31	$0.177	$0.203	31	70%	1,926,452,732
7,036,063	1,445	$178,143	$694,391	$180,966	$3,489	$1,056,990	$12.52	$0.124	$0.150	365	56%	24,007,046,956

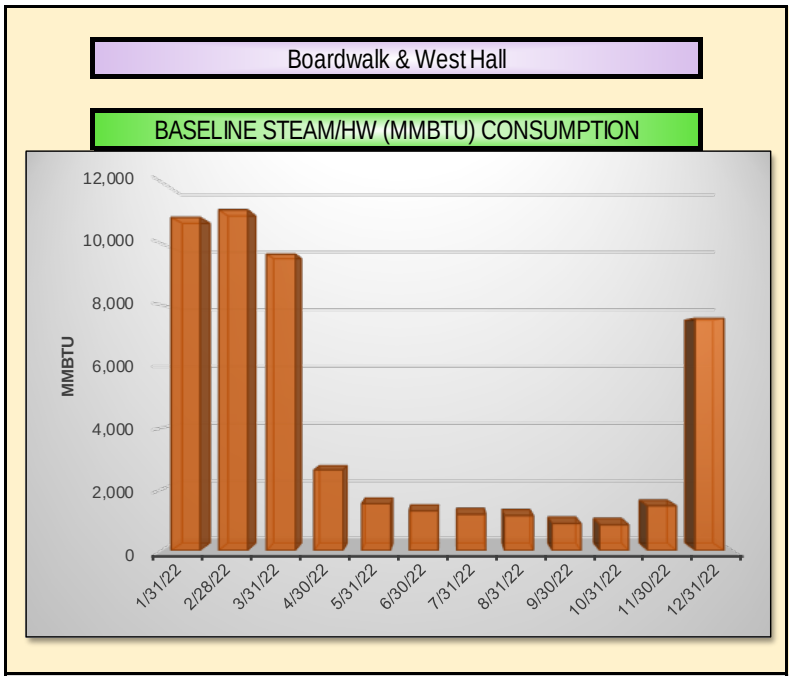

Boardwalk & West Hall
BASELINE kWh USAGE
kWh
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1/31/22
2/28/22
3/31/22
4/30/22
5/31/22
6/30/22
7/31/22
8/31/22
9/30/22
10/31/22
11/30/22
12/31/22


Boardwalk & West Hall
BASELINE kW DEMAND
kW
1,600
1,400
1,200
1,000
800
600
400
200
0
1/31/22
2/28/22
3/31/22
4/30/22
5/31/22
6/30/22
7/31/22
8/31/22
9/30/22
10/31/22
11/30/22
12/31/22

Boardwalk & West Hall						
Provider	ACM Energy Partners, LLC		CHILLED WATER (Tons/Hr)			
Meter/Acct #						
Billing Period Start Date	Actual Reading	CHILLED WATER (Tons/Hr)	$$	O&M Charge	Cost / Unit Checksum	BTU
1/1/22	1/31/22	163,690	$31,494	$10,919	$0.19	1,964,280,000
2/1/22	2/28/22	182,471	$27,168	$10,919	$0.15	2,189,652,000
3/1/22	3/31/22	263,611	$39,611	$10,919	$0.15	3,163,332,000
4/1/22	4/30/22	87,321	$15,799	$10,919	$0.18	1,047,852,000
5/1/22	5/31/22	116,376	$17,101	$10,919	$0.15	1,396,512,000
6/1/22	6/30/22	204,725	$30,766	$10,919	$0.15	2,456,700,000
7/1/22	7/31/22	269,262	$39,555	$10,919	$0.15	3,231,144,000
8/1/22	8/31/22	347,544	$55,788	$10,919	$0.16	4,170,528,000
9/1/22	9/30/22	194,627	$24,202	$10,919	$0.12	2,335,524,000
10/1/22	10/31/22	100,120	$12,329	$10,919	$0.12	1,201,440,000
11/1/22	11/30/22	155,200	$19,275	$10,919	$0.12	1,862,400,000
12/1/22	12/31/22	102,830	$20,087	$10,919	$0.20	1,233,960,000
TOTALS		2,187,777	$333,174	$131,033	$0.152	26,253,324,000



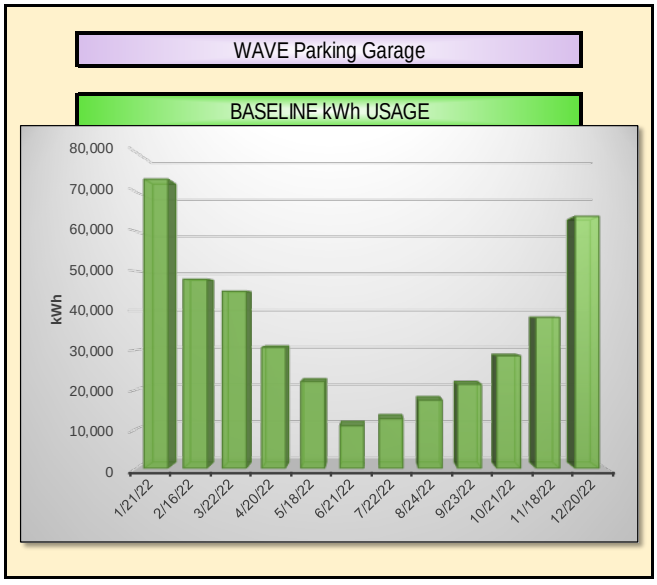
Boardwalk & West Hall						
Provider	ACM Energy Partners, LLC		STEAM/HW (MMBTU)			
Acct #						
Billing Period Start Date	Actual Reading	STEAM/HW (MMBTU)	$$	O&M Charge	Cost / Unit Checksum	BTU
1/1/22	1/31/22	10,860	$142,026	$10,919	$13.08	10,860,400,000
2/1/22	2/28/22	11,108	$145,268	$10,919	$13.08	11,108,300,000
3/1/22	3/31/22	9,661	$111,210	$10,919	$11.51	9,660,600,000
4/1/22	4/30/22	2,625	$24,950	$10,919	$9.50	2,625,400,000
5/1/22	5/31/22	1,525	$16,720	$10,919	$10.97	1,524,800,000
6/1/22	6/30/22	1,292	$13,462	$10,919	$10.42	1,292,300,000
7/1/22	7/31/22	1,179	$11,892	$10,919	$10.08	1,179,200,000
8/1/22	8/31/22	1,138	$13,638	$10,919	$11.98	1,138,100,000
9/1/22	9/30/22	879	$8,838	$10,919	$10.05	879,200,000
10/1/22	10/31/22	839	$6,620	$10,919	$7.90	838,500,000
11/1/22	11/30/22	1,459	$11,159	$10,919	$7.65	1,459,200,000
12/1/22	12/31/22	7,568	$127,387	$10,919	$16.83	7,568,400,000
TOTALS		50,134	$633,171	$131,033	$12.63	50,134,400,000

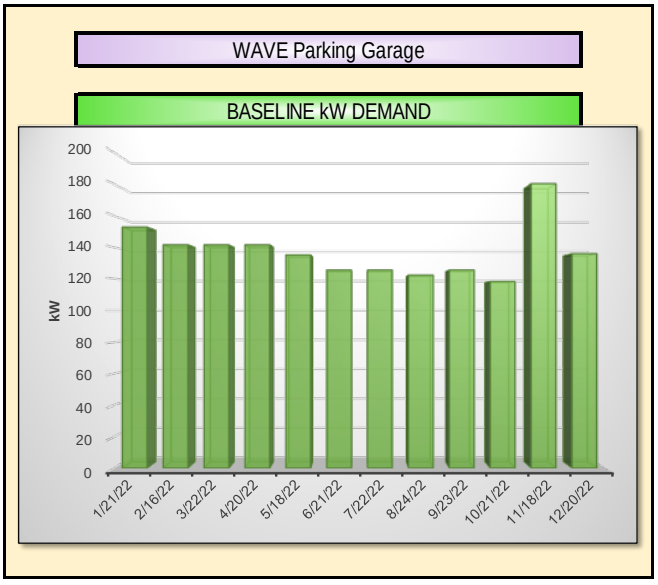


DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648

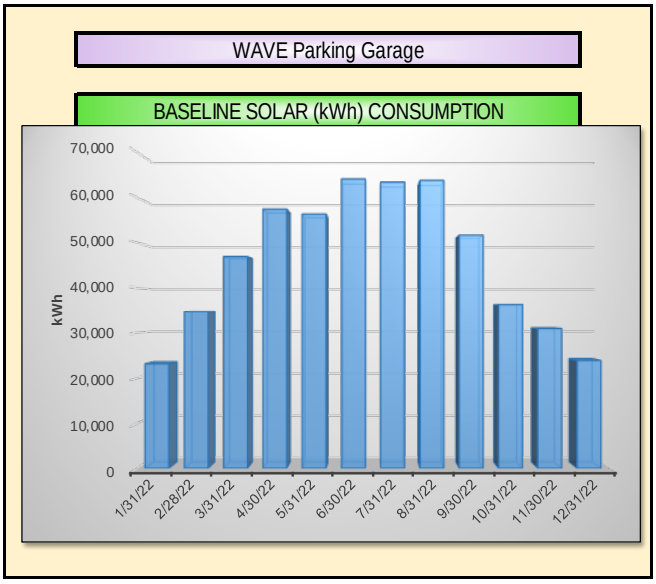
Wave Garage - Baseline Energy Use

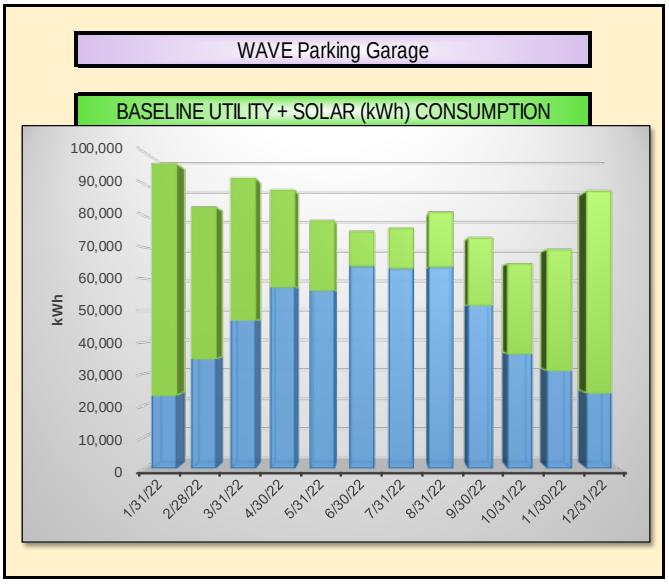
WAVE Parking Garage						ELECTRIC METER #1						
Provider:	AC Elec.			Account #	5500 7699 311				Meter #	99A091706907		
Commodity:				Account #					Meter #			
Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
12/21/21	**1/21/22**	73,280	153	$1,890	$5,173	$2,819	$206	$10,087.94	$0.138	32	62%	250,031,360
1/22/22	**2/16/22**	47,920	142	$1,236	$3,383	$2,171	$167	$6,957.86	$0.145	26	54%	163,503,040
2/17/22	**3/22/22**	44,880	142	$1,167	$3,169	$2,839	$219	$7,393.97	$0.165	34	39%	153,130,560
3/23/22	**4/20/22**	30,640	142	$800	$2,150	$2,431	$187	$5,567.31	$0.182	29	31%	104,543,680
4/21/22	**5/18/22**	22,000	135	$576	$1,539	$2,405	$193	$4,713.05	$0.214	28	24%	75,064,000
5/19/22	**6/21/22**	10,800	126	$246	$780	$2,383	$206	$3,615.96	$0.335	34	11%	36,849,600
6/22/22	**7/22/22**	12,560	126	$268	$856	$2,331	$200	$3,653.97	$0.291	31	13%	42,854,720
7/23/22	**8/24/22**	17,280	122	$370	$1,066	$2,313	$213	$3,961.37	$0.229	33	18%	58,959,360
8/25/22	**9/23/22**	21,280	126	$463	$1,467	$2,331	$193	$4,453.17	$0.209	30	24%	72,607,360
9/24/22	**10/21/22**	28,480	118	$610	$1,730	$2,291	$180	$4,811.47	$0.169	28	36%	97,173,760
10/22/22	**11/18/22**	38,240	180	$814	$2,145	$2,632	$180	$5,771.08	$0.151	28	32%	130,474,880
11/19/22	**12/20/22**	63,840	136	$1,647	$4,520	$2,388	$206	$8,760.90	$0.137	32	61%	217,822,080
TOTALS		411,200	180	$10,086	$27,979	$29,332	$2,351	$69,748	$0.170	365	26%	1,403,014,400





WAVE Parking Garage					
Provider	CRDA Onwed		SOLAR PPA (kWh)		
Meter/Acct #	SunFlow Monitor				
Billing Period Start Date	Actual Reading	SOLAR PPA (kWh)	$$	Cost / Unit Checksum	BTU
1/1/22	**1/31/22**	23,167	$0	$0.00	79,047,169
2/1/22	**2/28/22**	34,728	$0	$0.00	118,490,912
3/1/22	**3/31/22**	46,944	$0	$0.00	160,174,293
4/1/22	**4/30/22**	57,455	$0	$0.00	196,036,801
5/1/22	**5/31/22**	56,370	$0	$0.00	192,335,122
6/1/22	**6/30/22**	64,146	$0	$0.00	218,866,493
7/1/22	**7/31/22**	63,427	$0	$0.00	216,413,265
8/1/22	**8/31/22**	63,828	$0	$0.00	217,782,501
9/1/22	**9/30/22**	51,682	$0	$0.00	176,337,619
10/1/22	**10/31/22**	36,283	$0	$0.00	123,798,278
11/1/22	**11/30/22**	30,993	$0	$0.00	105,747,434
12/1/22	**12/31/22**	23,894	$0	$0.00	81,526,669
TOTALS		552,918	$0	$0.00	1,886,556,557





DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648

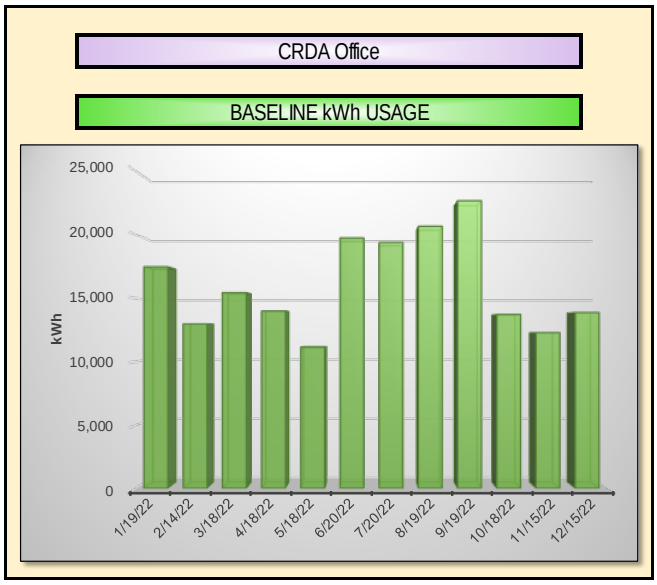
CRDA Office - Baseline Energy Use

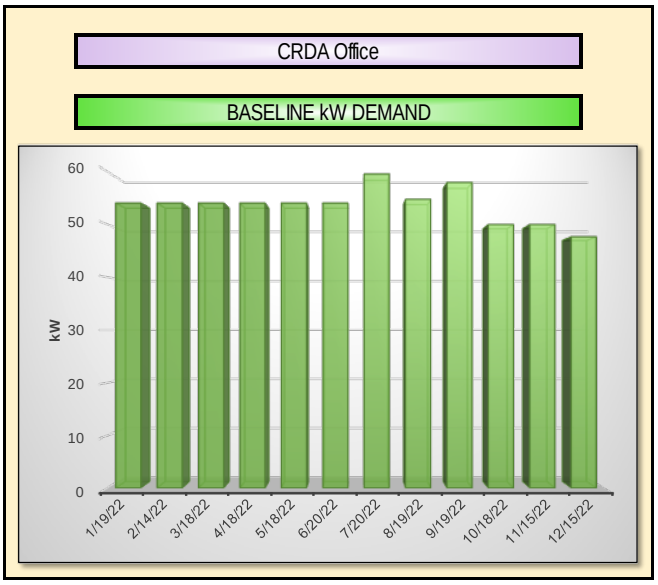
CRDA Office						ELECTRIC METER #1						
Provider:	AC Elec.			Account #	5500 4465 492				Meter #	99D036135471		
Commodity:				Account #					Meter #			
Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
12/17/21	**1/19/22**	13,960	54	$360	$985	$1,053	$219	$2,618	$0.188	34	32%	47,631,520
1/20/22	**2/14/22**	10,240	54	$264	$723	$829	$167	$1,984	$0.194	26	30%	34,938,880
2/15/22	**3/18/22**	12,640	54	$328	$893	$1,020	$206	$2,447	$0.194	32	30%	43,127,680
3/19/22	**4/18/22**	11,440	54	$299	$803	$992	$200	$2,294	$0.200	31	28%	39,033,280
4/19/22	**5/18/22**	8,880	54	$232	$621	$962	$193	$2,009	$0.226	30	23%	30,298,560
5/19/22	**6/20/22**	17,640	54	$407	$1,271	$1,058	$213	$2,949	$0.167	33	41%	60,187,680
6/21/22	**7/20/22**	17,360	60	$369	$1,275	$1,060	$193	$2,898	$0.167	30	40%	59,232,320
7/21/22	**8/19/22**	18,400	55	$394	$1,351	$975	$193	$2,913	$0.158	30	47%	62,780,800
8/20/22	**9/19/22**	20,080	58	$435	$1,474	$1,083	$200	$3,192	$0.159	31	47%	68,512,960
9/20/22	**10/18/22**	11,040	50	$237	$781	$884	$187	$2,089	$0.189	29	32%	37,668,480
10/19/22	**11/15/22**	9,480	50	$202	$656	$854	$180	$1,892	$0.200	28	28%	32,345,760
11/16/22	**12/15/22**	10,520	48	$224	$728	$873	$193	$2,017	$0.192	30	31%	35,894,240
TOTALS		161,680	60	$3,752	$11,562	$11,643	$2,344	$29,302	$0.181	364	31%	551,652,160

CRDA Office						ELECTRIC METER #2						
Provider:	AC Elec.			Account #	5500 4465 492				Meter #	Street and Private Lighting		
Commodity:				Account #					Meter #			
Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
12/17/21	**1/19/22**	935	0	$8	$47	$0	$189	$244	0.26	34	$0.00	3,190,220
1/20/22	**2/14/22**	617	0	$5	$31	$0	$136	$172	0.28	26	$0.00	2,105,204
2/15/22	**3/18/22**	774	0	$7	$39	$0	$184	$230	0.30	32	$0.00	2,640,888
3/19/22	**4/18/22**	587	0	$5	$29	$0	$158	$192	0.33	31	$0.00	2,002,844
4/19/22	**5/18/22**	521	0	$5	$26	$0	$158	$189	0.36	30	$0.00	1,777,652
5/19/22	**6/20/22**	547	0	$3	$30	$0	$180	$213	0.39	33	$0.00	1,866,364
6/21/22	**7/20/22**	476	0	$2	$27	$0	$158	$187	0.39	30	$0.00	1,624,112
7/21/22	**8/19/22**	549	0	$2	$32	$0	$169	$203	0.37	30	$0.00	1,873,188
8/20/22	**9/19/22**	637	0	$3	$37	$0	$174	$214	0.34	31	$0.00	2,173,444
9/20/22	**10/18/22**	641	0	$3	$36	$0	$158	$197	0.31	29	$0.00	2,187,092
10/19/22	**11/15/22**	673	0	$3	$38	$0	$153	$193	0.29	28	$0.00	2,296,276
11/16/22	**12/15/22**	770	0	$3	$43	$0	$164	$210	0.27	30	$0.00	2,627,240
TOTALS		7,727	0	$50	$415	$0	$1,978	$2,444	0.32	364	$0.00	26,364,524

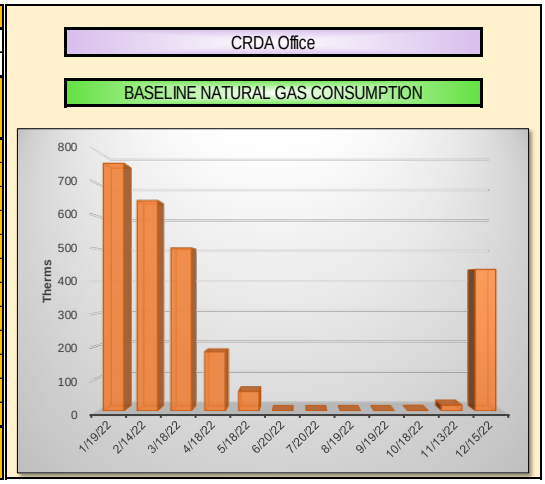
CRDA Office						ELECTRIC METER #3						
Provider:	AC Elec.			Account #	5500 4464 735				Meter #	Street and Private Lighting		
Commodity:				Account #					Meter #			
Billing Period Start Date	Actual Reading	Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kWh Checksum	Days	Load Factor	BTU
12/10/21	**1/11/22**	2,583	0	$532	$129	$0	$0	$661	$0.26	33	$0.00	8,813,196
1/12/22	**2/8/22**	2,120	0	$474	$106	$0	$0	$580	$0.27	28	$0.00	7,233,440
2/9/22	**3/9/22**	2,032	0	$490	$102	$0	$0	$592	$0.29	29	$0.00	6,933,184
3/10/22	**4/9/22**	1,976	0	$523	$99	$0	$0	$622	$0.31	31	$0.00	6,742,112
4/10/22	**5/10/22**	1,732	0	$522	$86	$0	$0	$607	$0.35	31	$0.00	5,909,584
5/11/22	**6/10/22**	1,568	0	$518	$82	$0	$0	$600	$0.38	31	$0.00	5,350,016
6/11/22	**7/13/22**	1,568	0	$518	$82	$0	$0	$600	$0.38	33	$0.00	5,350,016
7/14/22	**8/11/22**	1,732	0	$522	$86	$0	$0	$608	$0.35	29	$0.00	5,909,584
8/12/22	**9/10/22**	1,976	0	$523	$99	$0	$0	$622	$0.31	30	$0.00	6,742,112
9/11/22	**10/11/22**	2,032	0	$490	$102	$0	$0	$592	$0.29	31	$0.00	6,933,184
10/12/22	**11/9/22**	2,120	0	$474	$106	$0	$0	$580	$0.27	29	$0.00	7,233,440
11/10/22	**12/9/22**	2,583	0	$532	$129	$0	$0	$661	$0.26	30	$0.00	8,813,196
TOTALS		24022	0	$6,118	$1,207	$0		$7,325	$0.30	365	$0.00	81,963,064

CRDA Office												
TOTAL ELECTRIC												
Usage kWh	Demand kW	Electric Delivery Charges	Electric Commodity Charges	Electric Demand Charges	Fixed Customer Charges	Total Electric Charges	Cost / kW Checksum	Cost / kWh Checksum	Total Cost / kWh Checksum	Days	Load Factor	BTU
17,478	54	$900	$1,161	$1,053	$408	$3,523	$19.47	$0.118	$0.202	34	40%	59,634,936
12,977	54	$744	$860	$829	$303	$2,736	$15.33	$0.124	$0.211	26	38%	44,277,524
15,446	54	$825	$1,033	$1,020	$391	$3,269	$18.87	$0.120	$0.212	32	37%	52,701,752
14,003	54	$827	$932	$992	$357	$3,108	$18.34	$0.126	$0.222	31	35%	47,778,236
11,133	54	$759	$733	$962	$351	$2,805	$17.79	$0.134	$0.252	30	29%	37,985,796
19,755	54	$928	$1,383	$1,058	$392	$3,761	$19.57	$0.117	$0.190	33	46%	67,404,060
19,404	60	$890	$1,384	$1,060	$351	$3,685	$17.79	$0.117	$0.190	30	45%	66,206,448
20,681	55	$918	$1,469	$975	$362	$3,724	$17.79	$0.115	$0.180	30	52%	70,563,572
22,693	58	$961	$1,610	$1,083	$374	$4,028	$18.67	$0.113	$0.177	31	53%	77,428,516
13,713	50	$730	$920	$884	$345	$2,878	$17.67	$0.120	$0.210	29	39%	46,788,756
12,273	50	$679	$800	$854	$333	$2,665	$17.08	$0.120	$0.217	28	37%	41,875,476
13,873	48	$759	$900	$873	$357	$2,889	$18.30	$0.120	$0.208	30	40%	47,334,676
193,429	60	$9,920	$13,184	$11,643	$4,323	$39,070	$18.06	$0.119	$0.202	364	37%	659,979,748





CRDA Office						Natural Gas Meter #1		
Provider	SJG		Account #	2725100000		Meter #	0670051	
Commodity			Account #			Meter #		
Billing Period Start Date	Actual Reading	Therms	Gas Delivery Charges	Gas Commodity Charges	Fixed Customer Charge	Gas Total Charges	Cost/Therm Checksum	BTU
12/16/21	1/19/22	762	$663	$359	$39	$1,023	$1.34	76,235,000
1/20/22	2/14/22	647	$567	$305	$30	$872	$1.35	64,728,000
2/15/22	3/18/22	501	$440	$236	$37	$676	$1.35	50,149,000
3/19/22	4/18/22	182	$160	$86	$36	$246	$1.35	18,181,000
4/19/22	5/18/22	60	$53	$28	$35	$81	$1.35	5,980,000
5/19/22	6/20/22	0	$0	$0	$38	$0	$0.00	0
6/21/22	7/20/22	0	$0	$0	$35	$0	$0.00	0
7/21/22	8/19/22	0	$0	$0	$35	$0	$0.00	0
8/20/22	9/19/22	0	$0	$0	$36	$0	$0.00	0
9/20/22	10/18/22	1	$1	$1	$34	$2	$1.52	103,000
10/19/22	11/13/22	17	$16	$13	$32	$29	$1.63	1,749,000
11/14/22	12/15/22	436	$389	$321	$35	$710	$1.63	43,550,000
TOTALS		2,607	$2,289	$1,349	$422	$3,638	$1.40	260,675,000

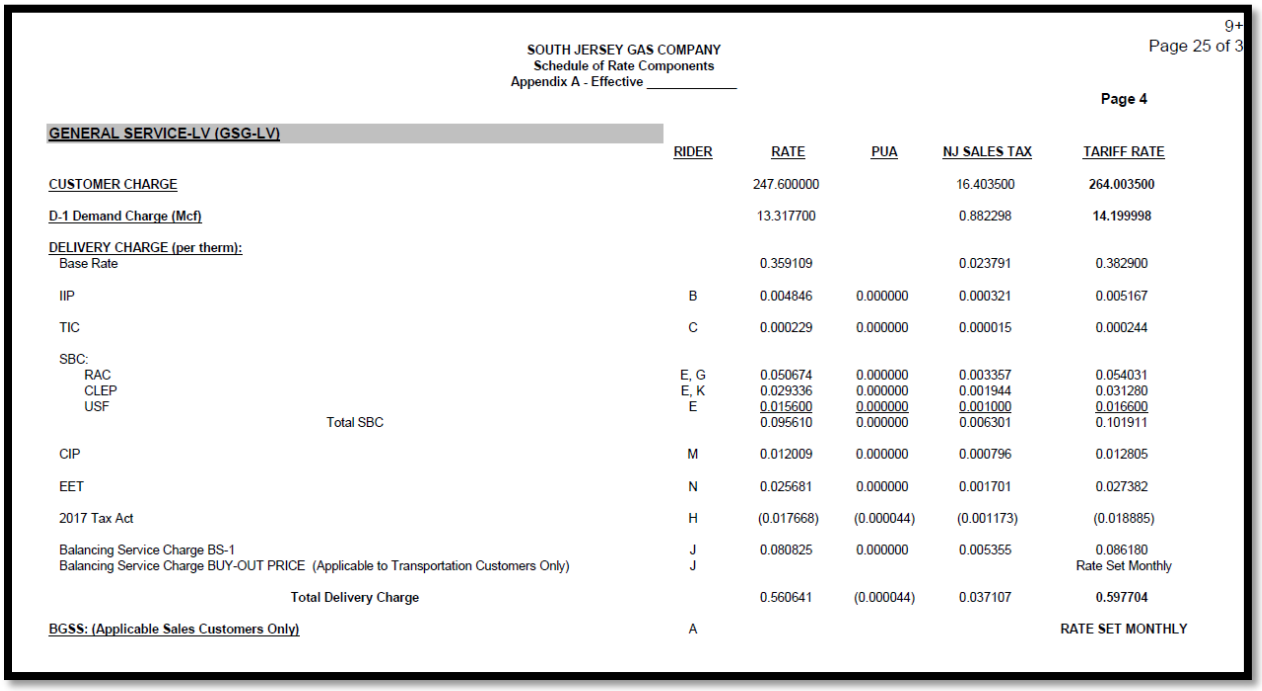


Energy Savings Utility Rates

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

CALCULATED UTILITY RATES BY BUILDING							
BUILDING/FACILITY	ELECTRIC			NATURAL GAS	OTHER ENERGY #1	OTHER ENERGY #2	OTHER ENERGY #3
	$$ / kW	$$ / kWh	Blended $$ / kWh	Therms	SOLAR PPA (kWh)	CHILLED WATER (Tons/Hr)	STEAM/HW (MMBTU)
Atlantic City Convention Center	$11.56	$0.130	$0.16	$1.37	$0.194	$0.608	$76.762
Boardwalk & West Hall	$12.52	$0.124	$0.15	$0.00	$0.00	$0.152	$12.629
WAVE Parking Garage	$17.94	$0.093	$0.17	$0.00	$0.000	$0.00	$0.00
CRDA Office	$18.06	$0.119	$0.20	$1.40	$0.00	$0.00	$0.00

Note:
The Natural Gas rate used for the Atlantic City Convention Center (ACCC) is based on the new rate structure accounting for the increased Natural Gas consumption of the building discussed in ECM #1. Atlantic City Electric confirmed in writing that, based on the increase that ACCC will need, they are eligible for the GSG-LV Delivery Charge of $0.597704 per Therm. DCO also applied a commodity charge of $0.77 per Therm for a total marginal rate of 1.37 per Therm. These rates were only applied to ACCC and we only applied to calculate the future consumption costs of ECM #1. For further details, please see the ECM #1 write-up.



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SOUTH JERSEY GAS COMPANY
Schedule of Rate Components
Appendix A - Effective _____

Page 4

GENERAL SERVICE-LV (GSG-LV)	RIDER	RATE	PUA	NJ SALES TAX	TARIFF RATE
CUSTOMER CHARGE		247.600000		16.403500	264.003500
D-1 Demand Charge (Mcf)		13.317700		0.882298	14.199998
DELIVERY CHARGE (per therm):					
Base Rate		0.359109		0.023791	0.382900
IIP	B	0.004846	0.000000	0.000321	0.005167
TIC	C	0.000229	0.000000	0.000015	0.000244
SBC:					
RAC	E, G	0.050674	0.000000	0.003357	0.054031
CLEP	E, K	0.029336	0.000000	0.001944	0.031280
USF	E	0.015600	0.000000	0.001000	0.016600
Total SBC		0.095610	0.000000	0.006301	0.101911
CIP	M	0.012009	0.000000	0.000796	0.012805
EET	N	0.025681	0.000000	0.001701	0.027382
2017 Tax Act	H	(0.017668)	(0.000044)	(0.001173)	(0.018885)
Balancing Service Charge BS-1	J	0.080825	0.000000	0.005355	0.086180
Balancing Service Charge BUY-OUT PRICE (Applicable to Transportation Customers Only)	J				Rate Set Monthly
Total Delivery Charge		0.560641	(0.000044)	0.037107	0.597704
BGSS: (Applicable Sales Customers Only)	A				RATE SET MONTHLY

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.

CASINO REINVESTMENT DEVELOPMENT AUTHORITY ECM MATRIX		Atlantic City Convention Center	Boardwalk & West Hall	WAVE Parking Garage	CRDA Office
ECM #	ECM DESCRIPTION				
1	New Chilled Water & Hot Water Central Plant	✔			
2	CRDA Owned Solar	✔	✔		
3	LED Lighting Replacement with Controls	✔	✔	✔	✔
4	Energy Management System Upgrade		✔		
5	Packaged Rooftop Unit Replacement				✔
6	Combined Heating & Power	✔			
7	Skylight Repair	✔			

ECM Included in the project	✔
ECM Evaluated but not included in the project	✔

DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648

Form II – Energy Conservation Measures Summary Form

FORM II

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ENERGY CONSERVATION MEASURES (ECMs) SUMMARY FORM
CASINO REINVESTMENT DEVELOPMENT AUTHORITY
ENERGY SAVINGS IMPROVEMENT PROGRAM

ESCO Name: DCO Energy

Proposed Preliminary Energy Savings Plan (Base Project)		Estimated Installed Hard Costs[1] $	Estimated Annual Savings $	Est. Simple Payback (Years)
ECM Numbe	Energy Conservation Measure			
1	New Chilled Water & Hot Water Central Plant	$24,761,814	$1,352,362	18.3
2	CRDA Owned Solar	$30,518,687	$1,514,186	20.2
3	LED Lighting Replacement with Controls	$4,293,265	$834,430	5.1
5	Packaged Rooftop Unit Replacement	$0	$934	0.0
6	Combined Heating & Power	$135,500	$190	712.3
*Add additional lines as needed**	**Project Summary:**	**$59,709,265**	**$3,702,103**	**16.1**

Optional ECMs *Considered, but not included with base project at this time*		Estimated Installed Hard Costs[1] $	Estimated Annual Savings $	Est. Simple Payback (Years)
ECM Number	Energy Conservation Measure			
4	Energy Management System Upgrade	$3,014,852	$96,635	31.2
7	Skylight Repair	$1,500,000	$0	-
*Add additional lines as needed**	**Optional ECMs Summary:**	**$4,514,852**	**$96,635**	**46.7**

Proposed Energy Related Capital Improvements (Base Project)		Supporting ECM	Estimated Cost $	Percentage of Total Project Cost (Not to Exceed 15%)
ECM Number	Energy Conservation Measure			
*Add additional lines as needed**	**Optional ECMs Summary:**	**-**	**$0**	**0.0**

(1) 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, Profit, etc.

ECM Breakdown by Cost & Savings

CASINO REINVESTMENT DEVELOPMENT AUTHORITY		INSTALLED COST	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS	ANNUAL CHILLED WATER (Tons/Hr) COST SAVINGS
ECM #	ENERGY CONSERVATION MEASURE	$	$	$	$
1	New Chilled Water & Hot Water Central Plant	$18,174,068	($235,911)	($373,099)	$931,578
2	CRDA Owned Solar	$30,518,687	$1,514,186	$0	$0
3	LED Lighting Replacement with Controls	$4,293,265	$834,430	$0	$0
4	Energy Management System Upgrade	$0	$0	$0	$0
5	Packaged Rooftop Unit Replacement	$0	$934	$0	$0
6	Combined Heating & Power	$135,500	$1,697	($1,507)	$0
7	Skylight Repair	$0	$0	$0	$0
TOTALS		$53,121,519	$2,115,337	($374,606)	$931,578

CASINO REINVESTMENT DEVELOPMENT AUTHORITY		ANNUAL STEAM/HW (MMBTU) COST SAVINGS	ANNUAL ENERGY COST SAVINGS	ANNUAL O&M COST SAVINGS	TOTAL ANNUAL COST SAVINGS	SIMPLE PAYBACK WITHOUT INCENTIVES
ECM #	ENERGY CONSERVATION MEASURE	$	$	$	$	YEARS
1	New Chilled Water & Hot Water Central Plant	$1,029,794	$1,352,362	$0	$1,352,362	13.4
2	CRDA Owned Solar	$0	$1,514,186	$0	$1,514,186	20.2
3	LED Lighting Replacement with Controls	$0	$834,430	$189,886	$1,024,316	4.2
4	Energy Management System Upgrade	$0	$0	$0	$0	0.0
5	Packaged Rooftop Unit Replacement	$0	$934	$0	$934	0.0
6	Combined Heating & Power	$0	$190	$0	$190	712.3
7	Skylight Repair	$0	$0	$0	$0	0.0
TOTALS		$1,029,794	$3,702,103	$189,886	$3,891,989	13.6

CASINO REINVESTMENT DEVELOPMENT AUTHORITY		ELECTRIC CONSUMPTION SAVINGS	ELECTRIC DEMAND SAVINGS	NATURAL GAS SAVINGS
ECM #	ENERGY CONSERVATION MEASURE	kWh	kW	THERMS
1	New Chilled Water & Hot Water Central Plant	(1,818,745)	0	(272,792)
2	CRDA Owned Solar	0	0	0
3	LED Lighting Replacement with Controls	5,330,803	1,166	0
4	Energy Management System Upgrade	0	0	0
5	Packaged Rooftop Unit Replacement	7,820	0	0
6	Combined Heating & Power	8,810	4	(1,102)
7	Skylight Repair	0	0	0
TOTALS		3,528,688	1,170	(273,894)

CASINO REINVESTMENT DEVELOPMENT AUTHORITY		CHILLED WATER (Tons/Hr) SAVINGS	STEAM/HW (MMBTU) SAVINGS
ECM #	ENERGY CONSERVATION MEASURE	0	0
1	New Chilled Water & Hot Water Central Plant	1,018,656	11559.2
2	CRDA Owned Solar	0	0
3	LED Lighting Replacement with Controls	0	0
4	Energy Management System Upgrade	0	0
5	Packaged Rooftop Unit Replacement	0	0
6	Combined Heating & Power	0	0
7	Skylight Repair	0	0
	TOTALS	1,018,656	11559.2

ECM Breakdown by Greenhouse Gas Reduction

CASINO REINVESTMENT DEVELOPMENT AUTHORITY		Reduction of CO_2	Reduction of Nox	Reduction of SO_2	Reduction of Hg
ECM #	ENERGY CONSERVATION MEASURE	LBS	LBS	LBS	LBS
1	New Chilled Water & Hot Water Central Plant	-5,541,488	-17,605	-12,186	-0.4
2	CRDA Owned Solar	0	0	0	0.0
3	LED Lighting Replacement with Controls	6,887,397	44,246	35,716	1.3
4	Energy Management System Upgrade	0	0	0	0.0
5	Packaged Rooftop Unit Replacement	10,103	65	52	0.0
6	Combined Heating & Power	-1,511	63	59	0.0
7	Skylight Repair	0	0	0	0.0
	TOTALS	1,354,501.7	26,768.3	23,642.2	0.9

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

- *CO2 = (1.292*kWh Savings) + (11.7*Therm Savings)*
- *NOx = (0.0083*kWh Savings) + (0.0092*Therm Savings)*
- *SO2 = (0.0067*kWh Savings)*
- *Hg = (0.0000000243* kWh Savings)*

ECM Breakdown by Building

CASINO REINVESTMENT DEVELOPMENT AUTHORITY			INCLUDED IN PROJECT	INSTALLED COST	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$	$
1	Atlantic City Convention Center	New Chilled Water & Hot Water Central Plant	Y	$18,174,068	($235,911)	($373,099)
2	Atlantic City Convention Center	CRDA Owned Solar	Y	$24,761,814	$1,096,494	$0
3	Atlantic City Convention Center	LED Lighting Replacement with Controls	Y	$3,222,326	$595,365	$0
6	Atlantic City Convention Center	Combined Heating & Power	Y	$135,500	$1,697	($1,507)
7	Atlantic City Convention Center	Skylight Repair	N	$0	$0	$0
2	Boardwalk & West Hall	CRDA Owned Solar	Y	$5,756,873	$417,692	$0
3	Boardwalk & West Hall	LED Lighting Replacement with Controls	Y	$588,505	$168,271	$0
4	Boardwalk & West Hall	Energy Management System Upgrade	N	$0	$0	$0
3	WAVE Parking Garage	LED Lighting Replacement with Controls	Y	$437,346	$63,377	$0
3	CRDA Office	LED Lighting Replacement with Controls	Y	$45,088	$7,417	$0
5	CRDA Office	Packaged Rooftop Unit Replacement	Y	$0	$934	$0
		TOTALS		$53,121,519	$2,115,337	($374,606)

CASINO REINVESTMENT DEVELOPMENT AUTHORITY			INCLUDED IN PROJECT	ANNUAL CHILLED WATER (Tons/Hr) COST SAVINGS	ANNUAL STEAM/HW (MMBTU) COST SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$
1	Atlantic City Convention Center	New Chilled Water & Hot Water Central Plant	Y	$931,578	$1,029,794
2	Atlantic City Convention Center	CRDA Owned Solar	Y	$0	$0
3	Atlantic City Convention Center	LED Lighting Replacement with Controls	Y	$0	$0
6	Atlantic City Convention Center	Combined Heating & Power	Y	$0	$0
7	Atlantic City Convention Center	Skylight Repair	N	$0	$0
2	Boardwalk & West Hall	CRDA Owned Solar	Y	$0	$0
3	Boardwalk & West Hall	LED Lighting Replacement with Controls	Y	$0	$0
4	Boardwalk & West Hall	Energy Management System Upgrade	N	$0	$0
3	WAVE Parking Garage	LED Lighting Replacement with Controls	Y	$0	$0
3	CRDA Office	LED Lighting Replacement with Controls	Y	$0	$0
5	CRDA Office	Packaged Rooftop Unit Replacement	Y	$0	$0
		TOTALS		$931,578	$1,029,794

CASINO REINVESTMENT DEVELOPMENT AUTHORITY			INCLUDED IN PROJECT	ANNUAL ENERGY COST SAVINGS	ANNUAL O&M COST SAVINGS	TOTAL ANNUAL COST SAVINGS	SIMPLE PAYBACK WITHOUT INCENTIVES
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$	$	$	YEARS
1	Atlantic City Convention Center	New Chilled Water & Hot Water Central Plant	Y	$1,352,362	$0	$1,352,362	13.4
2	Atlantic City Convention Center	CRDA Owned Solar	Y	$1,096,494	$0	$1,096,494	22.6
3	Atlantic City Convention Center	LED Lighting Replacement with Controls	Y	$595,365	$148,413	$743,778	4.3
6	Atlantic City Convention Center	Combined Heating & Power	Y	$190	$0	$190	712.3
7	Atlantic City Convention Center	Skylight Repair	N	$0	$0	$0	0.0
2	Boardwalk & West Hall	CRDA Owned Solar	Y	$417,692	$0	$417,692	13.8
3	Boardwalk & West Hall	LED Lighting Replacement with Controls	Y	$168,271	$27,288	$195,559	3.0
4	Boardwalk & West Hall	Energy Management System Upgrade	N	$0	$0	$0	0.0
3	WAVE Parking Garage	LED Lighting Replacement with Controls	Y	$63,377	$13,041	$76,418	5.7
3	CRDA Office	LED Lighting Replacement with Controls	Y	$7,417	$1,144	$8,561	5.3
5	CRDA Office	Packaged Rooftop Unit Replacement	Y	$934	$0	$934	0.0
		TOTALS		$3,702,103	$189,886	$3,891,989	13.6

CASINO REINVESTMENT DEVELOPMENT AUTHORITY			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	Atlantic City Convention Center	New Chilled Water & Hot Water Central Plant	Y	(1,818,745)	0	(272,792)
2	Atlantic City Convention Center	CRDA Owned Solar	Y	0	0	0
3	Atlantic City Convention Center	LED Lighting Replacement with Controls	Y	3,642,740	886	0
6	Atlantic City Convention Center	Combined Heating & Power	Y	8,810	4	(1,102)
7	Atlantic City Convention Center	Skylight Repair	N	0	0	0
2	Boardwalk & West Hall	CRDA Owned Solar	Y	0	0	0
3	Boardwalk & West Hall	LED Lighting Replacement with Controls	Y	1,107,279	206	0
4	Boardwalk & West Hall	Energy Management System Upgrade	N	0	0	0
3	WAVE Parking Garage	LED Lighting Replacement with Controls	Y	540,460	62	0
3	CRDA Office	LED Lighting Replacement with Controls	Y	40,324	12	0
5	CRDA Office	Packaged Rooftop Unit Replacement	Y	7,820	0	0
		TOTALS		3,528,688	886.0	-273,894

CASINO REINVESTMENT DEVELOPMENT AUTHORITY			INCLUDED IN PROJECT	CHILLED WATER (Tons/Hr) SAVINGS	STEAM/HW (MMBTU) SAVINGS
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	0	0
1	Atlantic City Convention Center	New Chilled Water & Hot Water Central Plant	Y	1,018,656	11,559
2	Atlantic City Convention Center	CRDA Owned Solar	Y	0	0
3	Atlantic City Convention Center	LED Lighting Replacement with Controls	Y	0	0
6	Atlantic City Convention Center	Combined Heating & Power	Y	0	0
7	Atlantic City Convention Center	Skylight Repair	N	0	0
2	Boardwalk & West Hall	CRDA Owned Solar	Y	0	0
3	Boardwalk & West Hall	LED Lighting Replacement with Controls	Y	0	0
4	Boardwalk & West Hall	Energy Management System Upgrade	N	0	0
3	WAVE Parking Garage	LED Lighting Replacement with Controls	Y	0	0
3	CRDA Office	LED Lighting Replacement with Controls	Y	0	0
5	CRDA Office	Packaged Rooftop Unit Replacement	Y	0	0
		TOTALS		1,018,656	11,559

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.

CASINO REINVESTMENT DEVELOPMENT AUTHORITY			INCLUDED IN PROJECT	INSTALLED COST
ECM #	BUILDING/FACILITY	ENERGY CONSERVATION MEASURE	"Y" OR "N"	$
1	Atlantic City Convention Center	New Chilled Water & Hot Water Central Plant	Y	$18,174,068
2	Atlantic City Convention Center	CRDA Owned Solar	Y	$24,761,814
3	Atlantic City Convention Center	LED Lighting Replacement with Controls	Y	$3,222,326
6	Atlantic City Convention Center	Combined Heating & Power	Y	$135,500
7	Atlantic City Convention Center	Skylight Repair	N	$0
2	Boardwalk & West Hall	CRDA Owned Solar	Y	$5,756,873
3	Boardwalk & West Hall	LED Lighting Replacement with Controls	Y	$588,505
4	Boardwalk & West Hall	Energy Management System Upgrade	N	$0
3	WAVE Parking Garage	LED Lighting Replacement with Controls	Y	$437,346
3	CRDA Office	LED Lighting Replacement with Controls	Y	$45,088
5	CRDA Office	Packaged Rooftop Unit Replacement	Y	$0
		TOTALS		$53,121,519

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.

Commercial & Industrial Prescriptive Rebate Program

Commercial and industrial facilities with a peak electric demand exceeding 200 kW, the Commercial & Industrial Prescriptive Rebate Program is the best option for maximum rebates and incentives. This program is offered through public utilities and provides the technical and financial means to help improve the energy efficiency of your buildings. The program is designed to take a comprehensive approach to energy savings while allowing you to earn incentives that are directly linked to equipment type and size. This Prescriptive rebate program is your best option for lighting and controls, heating, cooling and ventilation (HVAC), refrigeration, kitchen equipment, Electronically Commutated Motors (ECM), electric water heaters, plug load controls, or variable speed drive (VSD) upgrades and installations.

Prescriptive rebates are designed to cover up to 50 percent of the incremental measure cost for installing high-efficiency equipment. Applications for this rebate are filed through your electric and natural gas provider.

Commercial & Industrial Custom Rebate Program

Commercial and industrial facilities with a peak electric demand exceeding 200 kW which have energy conservation measures that are not covered by the Prescriptive Rebate Program, the Custom Rebate Program is the best option to maximize rebates and incentives. This program is offered through public utilities and is designed to cover energy conservation measures or projects which are more unique in nature. All custom projects required for pre-approval, engineering analyses demonstrating savings, and a pre-inspection to determine eligibility.

The Custom Rebate Program Incentive structure breaks down as:

Electric – $.16/kwh saved for the first year
Natural Gas – $1.60/therm saved for the first year, and buydown to 1 year payback

Direct Install

Created specifically for existing small to mid-sized facilities, Direct Install is a turnkey project solution that makes it easy and affordable to upgrade to high-efficiency equipment. The program provides a free energy assessment, and a participating contractor will work with you to cut your facility's energy costs by replacing lighting, HVAC and other outdated operational equipment with energy efficient alternatives.

The DI Program is open to all eligible commercial and industrial customers whose *average* demand did not exceed 200 kW in any of the preceding twelve months, have their gas or electricity provided by one of New Jersey's Investor-Owned Utilities (IOUs), and pay into the Societal Benefits Charge (SBC).

To dramatically improve your payback on the project, the program pays up to 80% of retrofit costs to facilities within an Urban Enterprise Zone, Opportunity Zone, owned or operated by a local government, K-12 public school, or designated as affordable housing. Other types of facilities receive an incentive up to 70% of retrofit costs.

In 2019 the Direct Install program surpassed $200 million in incentives provided since its inception.

Systems and Equipment Addressed by the Program:

- Lighting & Lighting Controls
- Heating, Cooling & Ventilation (HVAC) and HVAC Controls
- Refrigeration
- Motors
- Variable Frequency Drives
- Hot Water Conservation Measures

* As of July 1, 2021, all of former NJ Clean Energy Program incentive programs transitioned over to the investor-owned gas and electric utility companies. Subsequently, the BPU is requiring that all ESIP projects consult with the DCA and follow all DCA guidance regarding the procurement of all subcontractors.

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 these 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

<u>Incentive Structure:</u>

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)

Incentive Calculations

Estimated incentive values were calculated in accordance with the Atlantic City Electric Prescriptive Rebate Program Guidelines. The total incentive amount was calculated to be $212,800 in rebates and incentives. Incentives are carried within Form VI of the CRDA Energy Savings Plan.

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, CRDA acknowledges and accepts that any project proposed should not rely on the receipt of incentives as a reason to implement it.

Demand Response, Direct Install, ACE Custom Incentives, & CHP Incentives were deemed to be non-applicable for this ESIP Project.

Solar Investment Tax Credits

The Inflation Reduction Act permitted public, tax-exempt entities to receive Investment Tax Credits (ITC) for various types of projects. CRDA is able to take advantage of the ITC for the solar ECMs being implemented at Atlantic City Convention Center and Boardwalk & West Hall.

Investment Tax Credit (ITC) for Energy Property (Tax Mechanism: Investment Tax Credit (ITC) available at COD, IRA #13102, Tax Code 26 U.S. Code § 48)								
Projects Beginning Construction before 1/1/2025		Base Credit	Prevailing Wage Adder	Domestic Content Adder	Energy Community / Brownfield Adder	Potential Total ITC	Tax Exempt Bond Finance Reduction	Potential Total ITC Utilizing Bond Financing
All	Solar	6.0%	24.0%	10.0%	10.0%	50.0%	-15.0%	35.0%
All	Combined Heat & Power (CHP)	6.0%	24.0%	10.0%	10.0%	50.0%	-15.0%	35.0%
All	Microgrid Controllers	6.0%	24.0%	10.0%	10.0%	50.0%	-15.0%	35.0%
All	Energy Storage	6.0%	24.0%	10.0%	10.0%	50.0%	-15.0%	35.0%

Clean Energy Investment Tax Credit (ITC) (Tax Mechanism: Investment Tax Credit (ITC) available at COD, IRA #13702, Tax Code 26 U.S. Code § 48)								
Projects Placed in Service After 12/31/2024 but Before 12/31/2032		Base Credit	Prevailing Wage Adder	Domestic Content Adder	Energy Community / Brownfield Adder	Potential Total ITC	Tax Exempt Bond Finance Reduction	Potential Total ITC Utilizing Bond Financing
All	Solar	6.0%	24.0%	10.0%	10.0%	50.0%	-15.0%	35.0%
Zero Greenhouse Gas Emissions	Combined Heat & Power (CHP)	6.0%	24.0%	10.0%	10.0%	50.0%	-15.0%	35.0%
All	Microgrid Controllers	6.0%	24.0%	10.0%	10.0%	50.0%	-15.0%	35.0%
All	Energy Storage	6.0%	24.0%	10.0%	10.0%	50.0%	-15.0%	35.0%

Clean Energy Investment Tax Credit (ITC) (Tax Mechanism: Investment Tax Credit (ITC) available at COD, IRA #13702, Tax Code 26 U.S. Code § 48)								
Projects Placed in Service After 1/1/2033 but Before 12/31/2037		Base Credit	Prevailing Wage Adder	Domestic Content Adder	Energy Community / Brownfield Adder	Total ITC	Tax Exempt Bond Finance Reduction	Total ITC Utilizing Bond Financing
All Applicable Above	2033	4.8%	19.2%	0.0%	8.0%	32.0%	-15.0%	17.0%
All Applicable Above	2034	3.8%	15.4%	0.0%	6.4%	25.6%	-15.0%	10.6%
All Applicable Above	2035	3.1%	12.3%	0.0%	5.1%	20.5%	-15.0%	5.5%
All Applicable Above	2036	2.5%	9.8%	0.0%	4.1%	16.4%	-15.0%	1.4%
All Applicable Above	2037	2.0%	7.9%	0.0%	3.3%	13.1%	-15.0%	-1.9%

TOTAL ESTIMATED ITC	$8,887,189

INVESTMENT TAX CREDIT COSTING ROLL-UP					
PROJECT COST	Percent	Total Cost	Non-Eligible	Eligible	Allocable
EPC Contracts	100.00%	$31,835,277	$7,438,552	$18,994,917	$5,401,808
Developer Fee	0.00%	$0			$0
Financing Fee	0.00%	$0			$0
TOTAL	100.00%	$31,835,277	$7,438,552	$18,994,917	$5,401,808

Non-Eligible ITC Percentage, Before Allocable Adjustment	23.37%
Eligible ITC Percentage, Before Allocable Adjustment	59.67%

ALLOCATION OF ALLOCABLE COSTS					
Non-Eligible	Allocable Cost	Total Non-Eligible	Eligible	Allocable Cost	Total Eligible
$7,438,552	$1,262,172.97	$8,700,725	$18,994,917	$3,223,056.24	$22,217,974

ITC ELIGIBLE CATEGORY (Y/N)					
BASE CREDIT	PREVAILING WAGE ADDER	DOMESTIC CONTENT ADDER	ENERGY COMMUNITY	TAX EXEMPT BOND FINANCE	POTENTIAL ITC
Y	Y	Y	N	N	40%

The breakdown of the ITC Cost Calculations are available below.

INVESTMENT TAX CREDIT WORKSHEET					
EPC COST	Percent	Total Cost	Non-Eligible	Eligible	Allocable
AC Wiring & Installation*	31.25%	$9,948,069		$9,948,069.00	
American Disability Act Upgrades*	0.00%	$0		$0	
Alta & Other Land Surveys	0.00%	$0		-	
Arc Flash Studies	0.00%	$0		-	
Building Structures (Permanent)*	0.00%	$0	-		
Clearing & Other Demolition Site Work	7.19%	$2,287,644	$2,287,644		
Combiner Boxes *	0.00%	$0		-	
DAS, SCADA and Metering system Package *	0.00%	$0		-	
DC Wiring & Installation*	0.00%	$0		-	
Drainage Site Work	0.00%	$0	-		
Engineering (Elect, Civil, Struct, Mech, Etc)	6.71%	$2,136,308		$2,136,308	
Environmental Surveys	0.00%	$0		-	
Equipment Pads & Encasements *	0.00%	$0		-	
Fencing *	0.00%	$0		-	
Contingency	4.31%	$1,373,341			$1,373,340.90
Project General Conditions	12.65%	$4,028,467			$4,028,467
Geotechnical Analysis	0.00%	$0		-	
Grading, Excavation, Grubbing & Soil Removal	0.00%	$0	-		
Insurance and Bonds	0.00%	$0			-
Interconnection Charges/Fees	0.03%	$10,120		$10,120	
Inverters *	2.67%	$849,750		$849,750	
Land Purchase	0.00%	$0	-		
Landscaping *	0.00%	$0	-		
Lighting *	0.00%	$0	-		
MET Tower *	0.00%	$0		-	
Mobilization	0.00%	$0			-
Parking Lot Paving & Surfacing *	0.00%	$0	-		
Permitting & Licenses	0.00%	$0		-	
Racking, Tracking System, Steel Structures *	3.56%	$1,133,000		$1,133,000	
Roads	0.00%	$0	-		
Roof Inspections & Repairs *	15.39%	$4,900,000	$4,900,000		
Roof Sacrificial Sheeting *	0.79%	$250,908	$250,908		
Site Security Systems *	0.00%	$0	-		
Sign, Illuminated *	0.00%	$0	-		
Solar PV Modules *	12.23%	$3,894,688		$3,894,688	
Spare Parts *	0.00%	$0	-		
Substation *	0.00%	$0		$0	
Switchgear *	1.64%	$523,240		$523,240	
Testing, Commissioning, Punchlist	1.25%	$396,743		$396,743	
Trailers, Office Furniture & Fixtures	0.00%	$0		-	
Transformers & Pads (After Step Up Transformer) *	0.32%	$103,000		$103,000	
Transformers & Pads (Up to Step Up Transformer) *	0.00%	$0		$0	
Utility Network Upgrades	0.00%	$0	-		
Utility Owned Equipment - All Other *	0.00%	$0	-		
Utility Owned Equipment - Substation *	0.00%	$0	-		
Utility Owned Equipment - Switchgear *	0.00%	$0	-		
Utility Owned Equipment - Totalizing Box *	0.00%	$0	-		
Utility Owned Equipment - Transformers & Pads *	0.00%	$0	-		
EPC COST TOTAL	100.00%	$31,835,277	$7,438,552	$18,994,917	$5,401,808
Notes:	* includes all related installation costs, shipping, storage, sales tax etc.				

ECM 1 – New Chilled Water & Hot Water Central Plant

Existing Conditions

CRDA is currently under a 25-year contract for the purchase of chilled water and hot water for the Atlantic City Convention Center (ACCC). The Thermal Plant that supplies ACCC with Chilled Water and Hot Water is located on the other side of Bacharach Blvd and is shown in the picture above. The thermal agreement contract is set to expire on December 31, 2025. In the 3rd Amendment to the contract specific to Article 3 entitled "Renewable Term", CRDA will need to address the following provision:

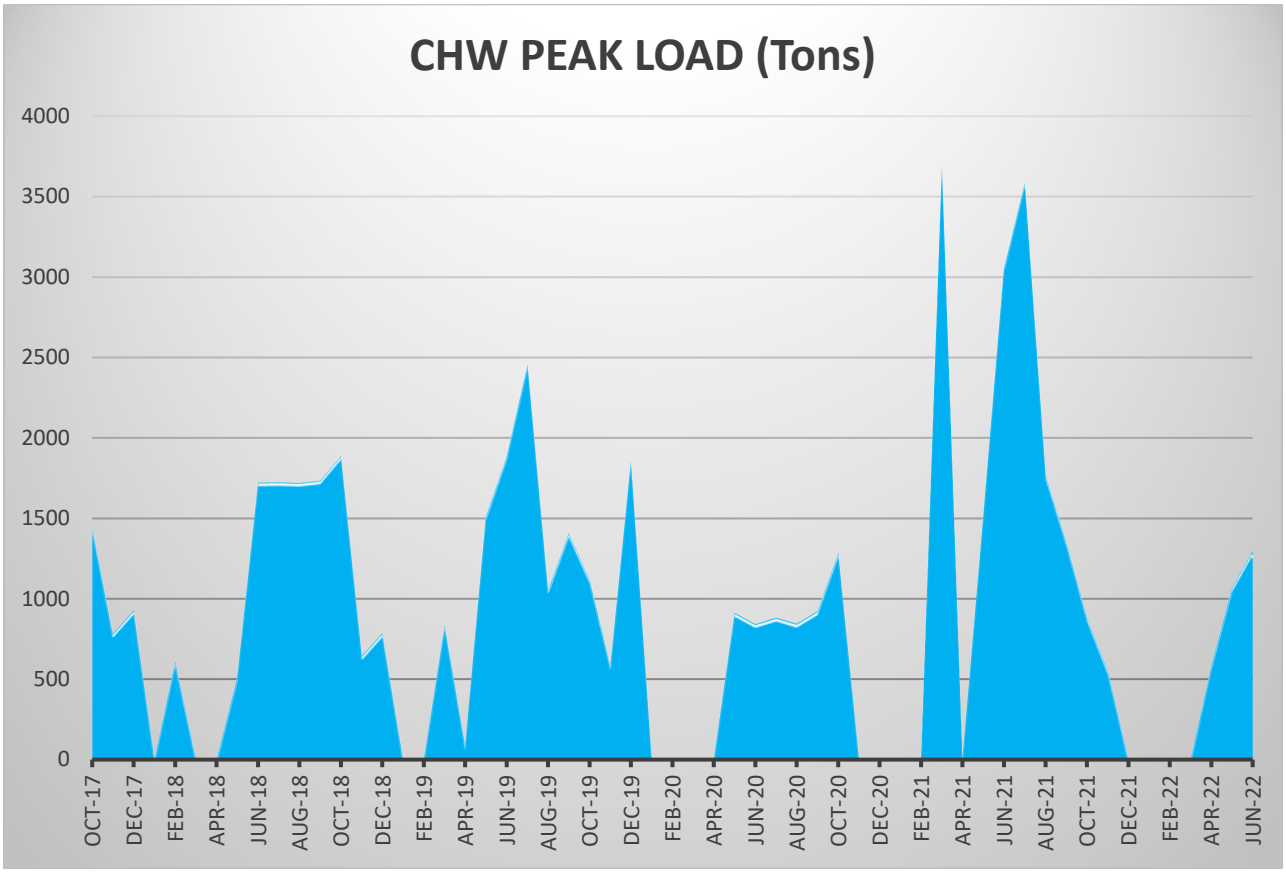
> *"No earlier than 27 months nor later than 18 months prior to the expiration of the Initial Term, either NJSEA or the Company may provide notice of its intent to terminate this Service agreement at the end of the Initial Term. If neither the NJSEA or the Seller provide such notice to terminate, the Term of this Service Agreement shall be deemed extended for an additional five (5) year term ("Renewal Period"). The fees and charges applicable to the heated fluid and chilled fluid services during the Renewal Period shall be determined in accordance with the provisions of Exhibit A to the Third Amendment."*

Should CRDA not wish to renew this contract, it must provide notice no later than 18 months prior to December 31, 2025 (by June 31, 2024) of their intent not to renew. The ESIP project scheduling and timing aligns very well with these deadlines. The savings generated from the ESIP will be used to fund, design, construct, commission, and enable a new Heating and Cooling Plant at ACCC. Considering the lead-times of various pieces of equipment that will be needed for a new plant, the current schedule as defined in the RFP will assure that CRDA will have a solution for a new plant and associated construction schedule in place prior to the June 31, 2024 deadline.

Should CRDA fail to provide notice it will have to renew the contract with the likely potential of increased costs for chilled water and hot water due to the major renovations required at the Thermal Plant to address the age of the infrastructure in the plant that is largely original from it construction in 1993.

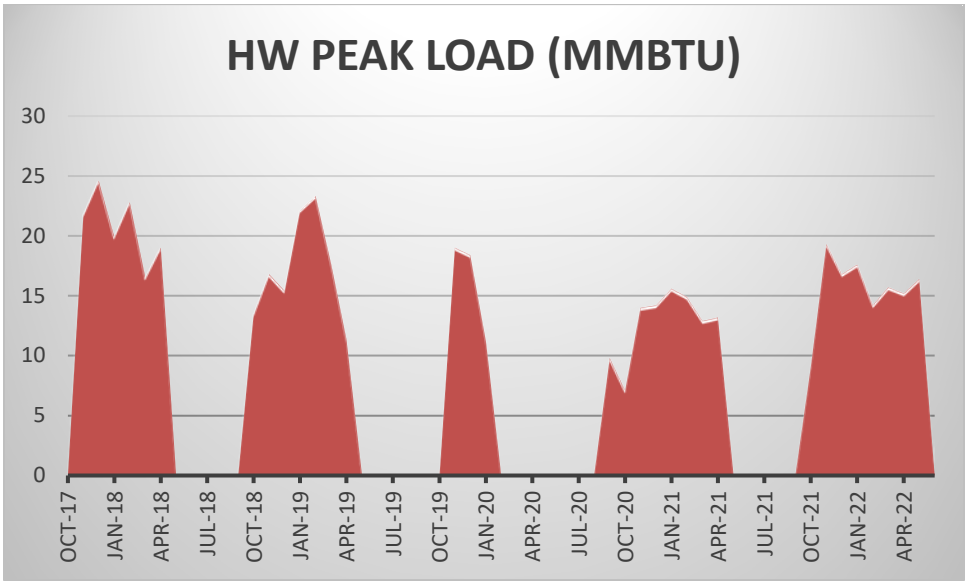
Scope of Work

DCO Energy conducted thorough surveys and explored multiple options for the location of a new Central Plant. Ultimately the decision to construct the plant in the existing 3rd floor mechanical penthouse was deemed the best option with the new cooling tower being installed directly above on the roof of the mechanical penthouse. After finding a suitable location, the task was then to determine the capacity of the new plant. DCO gained access to the existing Thermal Plant CHW Peak Loads delivered to ACCC in the last 5 years (see below).

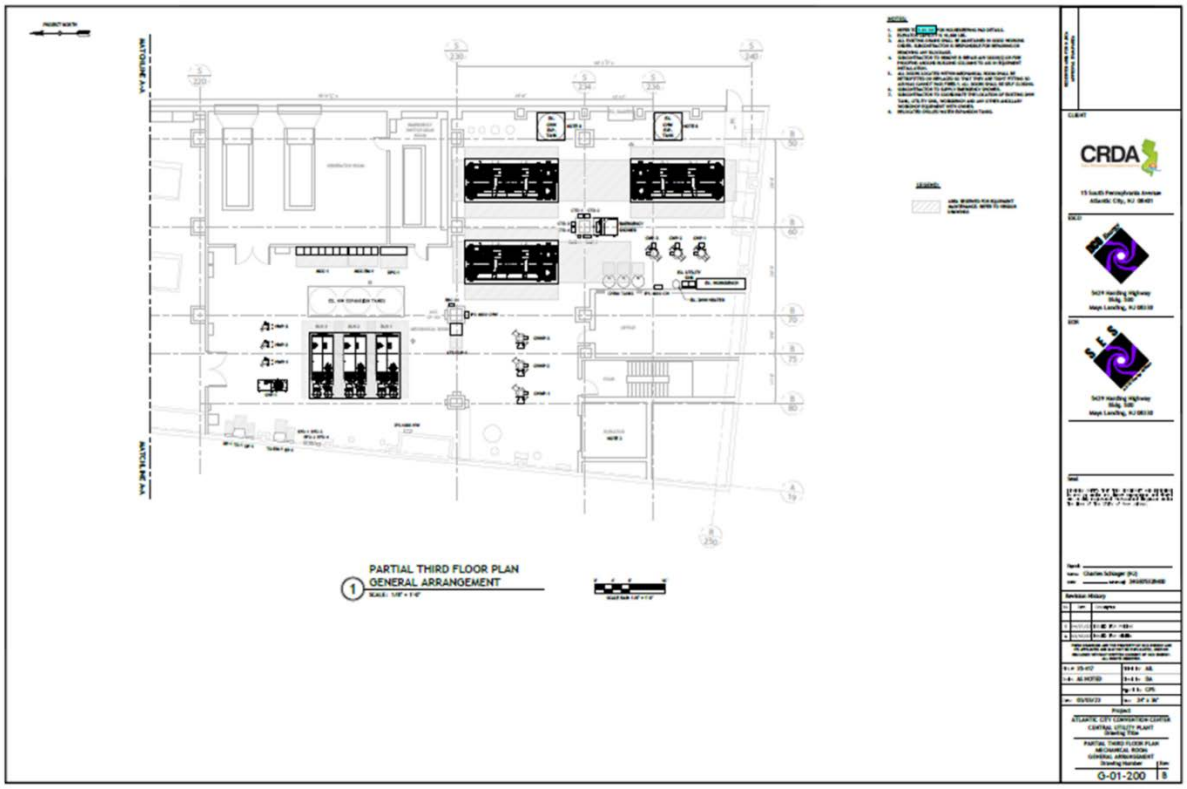


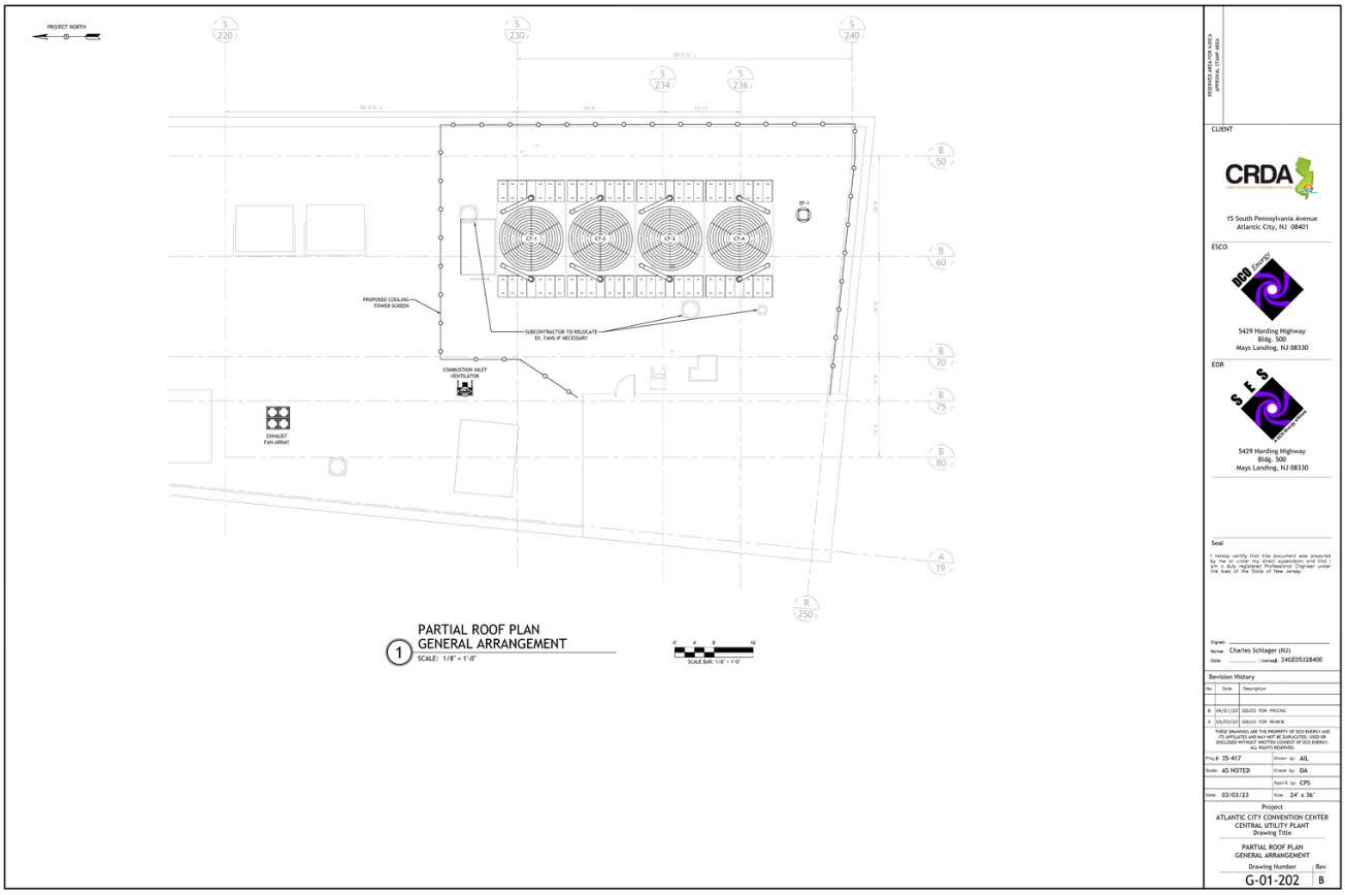
I was important to design a chilled water plant that could provide redundancy, enough capacity, and that can operate efficiently at part load. Per the historical data, ACCC exceeded 2,500 Tons three times in the last 5 years and only exceeded 3,500 Tons twice, with an average operation in the 800-1000 Ton range. The final decision was to use (3) 1,600 Ton Magnetic Centrifugal chillers with (2) compressors each and a 4-Cell 16.5 MMBTU/hr Cooling Tower. Chillers will have the latest refrigerants. Chilled Water Plant will have the appropriately sized CHW and CW Pumps/VFDs.

The boiler plant sizing was determined in similar fashion using historical HW Peak Load data from the Thermal Plant. The new boiler plant will be comprised of (3) 10MMBTU/hr Condensing Boilers. Hot Water Plant will have the appropriately sized HW Pumps/VFDs.



DCO Energy produced 50% design drawings around this plan to be sent to contractors for budgetary pricing. New central plant will also be equipped with an industrial control package. Basis of design for the controls is Rockwell Automation. The plant controls will be connected to the existing Honeywell automation system.





ECM Calculations

Considering this unique ECM, there aren't BPU Protocols to use that would appropriately calculate the energy cost savings. DCO Energy chose a far simpler method to conservatively calculate the savings for CRDA at ACCC.

First, consider that the existing Thermal Plant will no longer be operational, and the costs associated with purchasing the Chilled Water and Hot Water from that plant will no longer be spent. Therefore, using the baseline costs of purchasing the Chilled Water and Hot Water, an immediate annual energy cost savings of $1,961,372 will be realized by CRDA. Please note that, if CRDA doesn't construct the new plant, it will need to extend the existing thermal contract. As such, the $1,961,372 savings will extend annually into the future with escalation.

CHILLED WATER (Tons/Hr)				STEAM/HW (MMBTU)			
USAGE	USAGE BTU / SQFT	TOTAL COST $$	UNIT COST $$ /	USAGE	USAGE BTU / SQFT	TOTAL COST $$	UNIT COST $$ /
1,018,656	11,113	$931,578	$0.91	11,559	10,508.36	$1,029,794	$89.0887

Second, we now have to calculate the cost of Electricity and Natural Gas that will be consumed by the new Central Plant at ACCC. This is where the baseline information provides additional value and insight. The baseline data also provides a mechanism to calculate the cost of Electricity and Natural Gas simply and conservatively.

The existing Thermal Plant is 5,460 Tons has (4) 1365 Ton Centrifugal Chillers installed in 1993. The Boiler Plant has (3) 800 HP Fire-Tube Boilers also installed in 1993. The pumps consist of (3) 100 HP Chilled Water Pumps, (3) 150 HP Condenser Water Pumps, and (3) 75 HP Hot Water Pumps. There are also (2) Booster Pump skids located in the Mechanical Penthouse of ACCC for the CHW and HW Systems. The CHW Skid has (4) 150 HP CHW Booster Pumps and the HW Skid has (3) 100 HP HW Pumps.

Existing boilers and chillers in the thermal plant

Existing thermal plant pumps


Existing booster pump skids located in the ACCC Mechanical Penthouse

DCO Energy not only had the peak load data from the Thermal Plant. DCO also was able to obtain the utility bills for the Thermal Plant. So the consumption and costs of Electricity and Natural Gas that the Thermal Plant needed to provide Chilled Water and Hot Water for the ACCC is also known for the baseline period. Below is Electric Consumption and Natural Gas Consumption for the Thermal Plant during the baseline period.

Month		AC Electric 3231 1399 9995			
	Days	Demand	Kwh	Invoice	$/Kwh
Jan-22	31	267	169,415	$48,481.05	$0.2862
Feb-22	28	143	137,744	$18,354.07	$0.1332
Mar-22	31	136	121,079	$52,750.15	$0.4357
Apr-22	30	813	82,311	$33,221.91	$0.4036
May-22	31	1009	111,237	$42,074.76	$0.3782
Jun-22	30	1560	93,898	$37,882.96	$0.4034
Jul-22	31	1870	548,784	$108,185.12	$0.1971
Aug-22	31	1698	310,700	$87,928.45	$0.2830
Sep-22	30	1070	170,071	$48,821.55	$0.2871
Oct-22	31	1660	49,226	$33,698.18	$0.6846
Nov-22	30	1596	83,867	$34,347.01	$0.4095
Dec-22	31	1198	142,496	$54,322.28	$0.3812

Month		SJ Gas				
	Days	Mcf	BTU Factor	Therms	Invoice	$/Dth
Jan-22	31	8,718	10.34	90,144	$54,482.24	$6.04
Feb-22	28	5,983	10.34	61,864	$37,776.97	$6.11
Mar-22	31	4,286	10.33	44,274	$28,273.63	$6.39
Apr-22	30	2,022	10.31	20,847	$15,167.27	$7.28
May-22	31	302	10.30	3,111	$5,258.32	$16.90
Jun-22	30	-	10.29	-	$3,387.75	-
Jul-22	31	-	10.30	-	$3,500.67	-
Aug-22	31	-	10.31	-	$3,500.67	-
Sep-22	30	-	10.30	-	$3,387.75	-
Oct-22	31	5	10.29	51	$3,530.14	$686.13
Nov-22	30	1,936	10.32	19,980	$14,820.28	$7.42
Dec-22	31	5,126	10.35	53,054	$33,858.96	$6.38

Why is this data critical to calculating the electric and natural gas of the new plant? The Atlantic City Convention Center is not a typical building by any means. Its electric and natural gas consumption is purely a function of how many and what kind of conventions it hosts. 2022 loading data from the Thermal Plant showed that it was a typical year for CHW and Hot Water Loads and was removed from the COVID-affected loads of 2020 and 2021.

For reference, 10-Year historical electric and gas consumption of the Thermal Plant is provided below:

Electricity						Natural Gas				
Month		AC Electric 3231 1399 9995				Month		SJ Gas		
	Days	Demand	Kwh	Invoice	$/Kwh		Days	Therms	Invoice	$/Dth
2012	366	2,145	1,195,233	$155,565.69	$0.1302	2012	366	201,672	$91,627.25	$4.5434
2013	365	2,040	1,126,491	$261,418.64	$0.2321	2013	365	279,415	$125,552.79	$4.4934
2014	365	1,956	1,096,295	$266,307.66	$0.2429	2014	365	329,124	$143,602.68	$4.3632
2015	365	1,967	1,223,735	$241,894.59	$0.1977	2015	365	318,939	$133,761.78	$4.1940
2016	366	2,019	1,401,323	$265,851.63	$0.1897	2016	366	275,027	$109,726.11	$3.9896
2017	365	1,975	1,449,527	$259,947.85	$0.1793	2017	365	262,412	$128,459.28	$4.8953
2018	365	1,892	1,641,566	$329,001.79	$0.2004	2018	365	303,297	$150,248.39	$4.9538
2019	365	2,088	1,716,979	$371,763.70	$0.2165	2019	365	301,199	$157,815.73	$5.2396
2020	366	1,671	1,911,405	$393,923.65	$0.2061	2020	366	242,184	$154,687.58	$6.3872
2021	365	1,674	1,480,642	$411,657.38	$0.2780	2021	365	265,192	$183,828.21	$6.9319
2022	365	1,870	2,020,828	$600,067.49	$0.2969	2022	365	293,325	$206,944.65	$7.0551

In the Energy Savings Plan, DCO Energy is using the following, simple methodology to calculate the annual consumption of Electric and Natural gas.

Central Plant Electric & Gas Consumption Estimate						
BUILDING	2022 Baseline Thermal Plant Electric Usage (kWh)	Increased Plant Efficiency	Estimated Electric Consumption of more efficient Plant	2022 Baseline Thermal Plant Natural Gas Usage (Th)	Increased Plant Efficiency	Estimated Natural Gas Consumption of more efficient Plant
Atlantic City Convention Center	2,020,828	10%	1,818,745	293,325	7%	272,792

The new proposed condensing boilers are rated at 87% efficiency based on 180/160 HW supply & return temperatures. The new chillers are rated at a full load efficiency of 0.5746 kW/Ton and an NPLV of 0.3061. Per the above, DCO is calculating that the new plant will be 10% more efficient electrically with chillers/pump operations and 7% more efficient with boiler operations than the current Thermal Plant. While the existing efficiencies weren't able to be tested for the development of the ESP, considering the existing constant speed, single compressor chillers and large non-condensing fire-tube boilers are 25+ years old, the 10% and 7% efficiency improvements are very conservative. Using the electrical rates from the baseline period, the cost of electric for the new plant would be $235,911. As discussing the Utility Rates section, the new gas tariff of GSG-LV was used for the Natural Gas rates applied to the new plant for an annual Natural Gas cost of $373,099.

The Final Savings for the construction of a new Chilled Water and Hot Water Plant at ACCC is as follows:

Annual Savings from eliminating the Thermal Agreement	$1,961,372
Cost of Electric to operate the new plant	-$ 235,911
Cost of Natural Gas to operate the new plant	-$ 373,099
Total Annual Cost Savings for CRDA	$1,352,362

ECM 2 – CRDA Owned Solar

Effective on June 5, 2008, a 20-year Solar Power Purchase Agreement (PPA) was executed for solar arrays to be placed on the roof of the Atlantic City Convention Center (ACCC). The system was sized at 2,500 kW with an initial annual generation of 3,175,500 kWh. There were 14,707 solar panels installed with each panel delivering an approximate power output of 170 watts. Per the agreement, the electric generation was to be purchased at an initial rate of $0.103 per kWh and that rate was to escalate by 5% over the course of the 20-year agreement.

The PPA was groundbreaking when it was executed and was one of the largest solar installations of its kind in the United States. However, due to the escalation rate of 5% each year, in 2022 the PPA has become more expensive than if CRDA had purchased the electricity directly from the grid in lieu of the Solar Arrays. Where the 2022 cost of electricity purchased from the Solar Arrays is $0.194 per kWh, the cost from Atlantic City Electric is approximately $0.13 per kWh. The existing solar arrays have also degraded since 2008 and are producing 10% less electricity than they originally produced in 2008.

DCO has projected the impact of the Solar PPA through the end of the contract (see below). By the end of contract term, the PPA rate will have escalated to $0.26 per kWh.

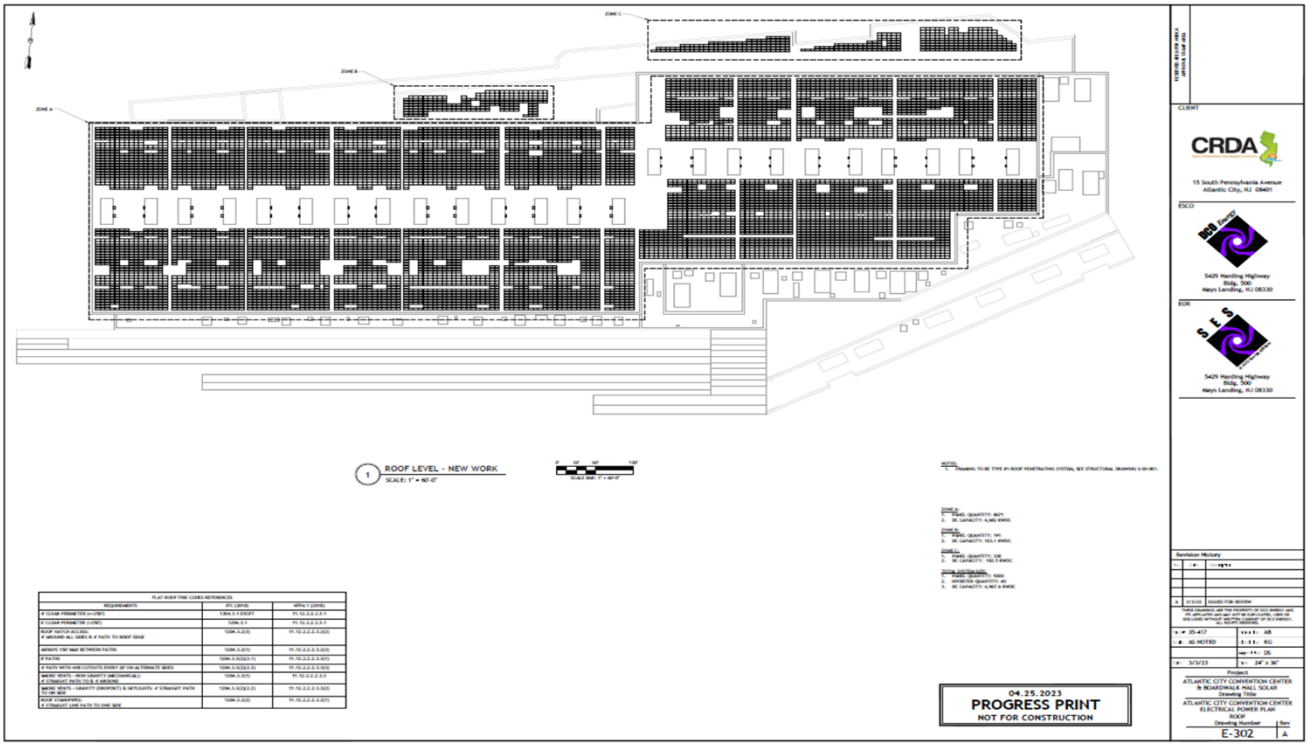
Calander Year	2023	2024	2025	2026	2027	2028
Contract Year	15	16	17	18	19	20
PPA Rate	$0.204	$0.214	$0.225	$0.236	$0.248	$0.260
Annual Production	3,102,051	3,094,296	3,086,560	3,078,844	3,071,147	3,063,469
Annual Revenue	$632,610	$662,580	$693,970	$726,847	$761,281	$797,347

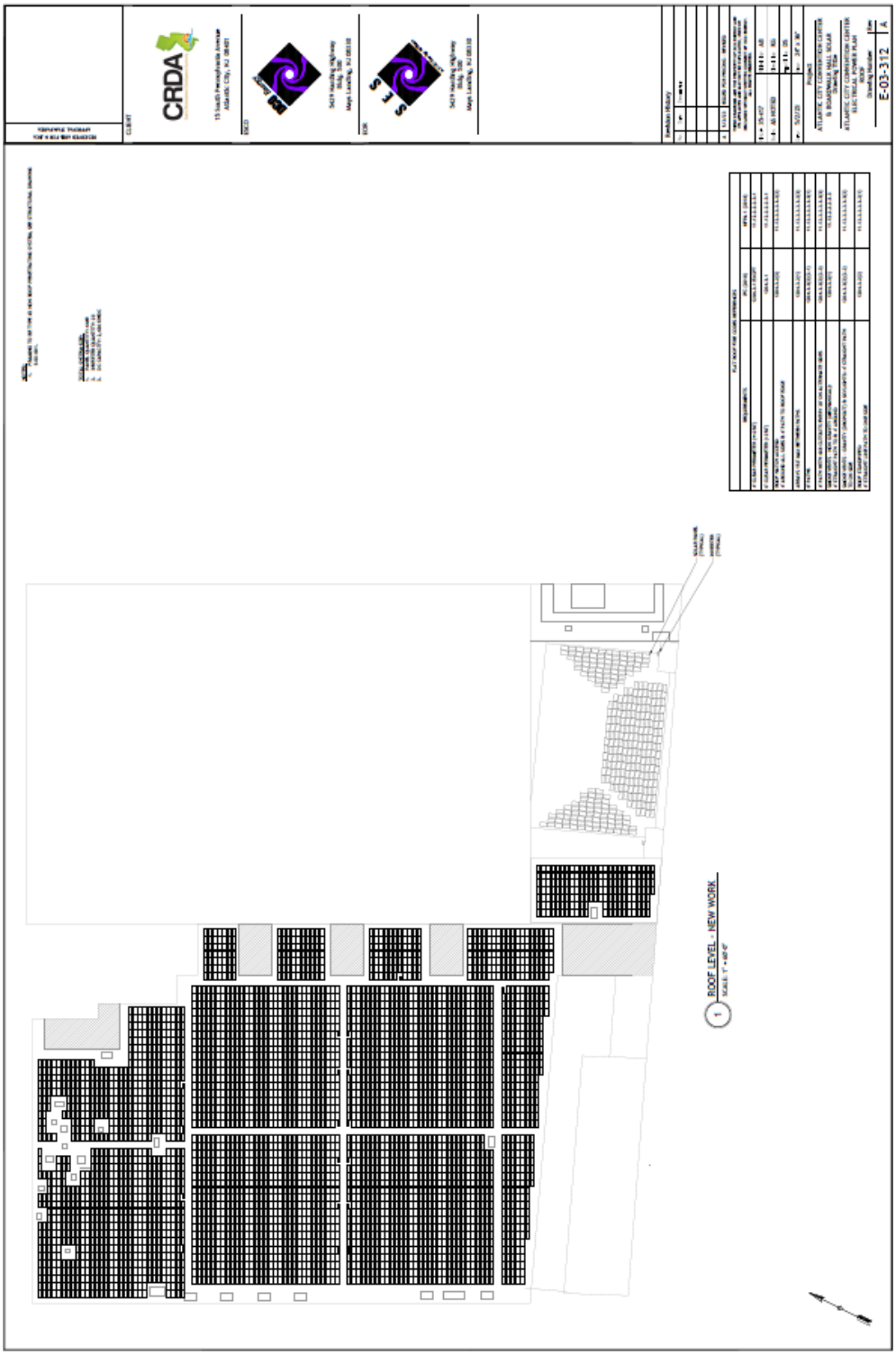
CRDA's experience with PPA agreements and the financial impact of new benefits contained in the Inflation Reduction Act have made owning Solar in lieu of PPA agreement viable for the Atlantic City Convention Center and Boardwalk & West Hall.

Scope of Work

DCO Energy produced preliminary 50% design packages for new Solar, that would be owned by CRDA, at Atlantic City Convention Center and Boardwalk & West Hall (BWH). These packages were used to compile information related to:

- Electric Generation Capability of each system
- Apply for Interconnection to Atlantic City Electric at each building
- Design and budget for new roofing at ACCC to go under the new panels. (Roofing at BWH was installed 3 years ago and does not need renovations)
- Budget for the removal of the existing system at ACCC
- Design and Budget for the installation of new systems at each building, including necessary electrical upgrades needs in each building
- Establish warranties for new panels & equipment that meet or exceed the financing term.
- Use the budgets for the new system to estimate the Investment Tax Credit benefit available for CRDA




CRDA
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ROOF LEVEL - NEW WORK

ECM Calculations

DCO Energy used the generation estimates for each of the solar arrays at ACCC and BWH to calculate the savings at each building. Based on the 50% Design Packages, the following kWh generation was calculated using PVWATTS:

- ACCC = 6,312,793 kWh
- BWH = 3,226,286 kWh

Based on an 20 Year Financing Term, the total project saving of owning solar at BWH is the following:

Boardwalk & West Hall				
YEAR	$$/kWh RATES		SOLAR kWh	SAVINGS
	UTILITY	SOLAR COST		
1	$0.129	$0.0000	3,226,286	$417,692
2	$0.132	$0.0000	3,218,220	$425,814
3	$0.135	$0.0000	3,210,175	$434,094
4	$0.138	$0.0000	3,202,149	$442,535
5	$0.141	$0.0000	3,194,144	$451,140
6	$0.144	$0.0000	3,186,159	$459,913
7	$0.148	$0.0000	3,178,193	$468,856
8	$0.151	$0.0000	3,170,248	$477,973
9	$0.154	$0.0000	3,162,322	$487,267
10	$0.157	$0.0000	3,154,416	$496,742
11	$0.161	$0.0000	3,146,530	$506,401
12	$0.164	$0.0000	3,138,664	$516,248
13	$0.168	$0.0000	3,130,817	$526,286
14	$0.172	$0.0000	3,122,990	$536,520
15	$0.176	$0.0000	3,115,183	$546,953
16	$0.179	$0.0000	3,107,395	$557,588
17	$0.183	$0.0000	3,099,626	$568,430
18	$0.187	$0.0000	3,091,877	$579,483
19	$0.192	$0.0000	3,084,148	$590,752
20	$0.196	$0.0000	3,076,437	$602,239
TOTAL			56,855,394	$8,899,936

The savings at ACCC are accounted for in 2 pieces. First, there are savings associated with owning the Solar versus the 5 years remaining on the Solar PPA. Even though the projected solar at ACCC will generate 6,312,793 kWh, the savings versus the existing PPA are capped at the projected generation of the existing panels.

Atlantic City Convention Center - Savings off Current PPA				
YEAR	$$/kWh RATES		SOLAR kWh	SAVINGS
	LUMINACE PPA	OWNED		
1	$0.214	$0.0000	3,102,051	$663,839
2	$0.225	$0.0000	3,094,296	$695,288
3	$0.236	$0.0000	3,086,560	$728,228
4	$0.248	$0.0000	3,078,844	$762,727
5	$0.260	$0.0000	3,071,147	$798,862
TOTAL			170,174,882	$30,204,553

Second, there are savings associated with owning the Solar versus buying the electricity from ACE. In the first 5 years of the analysis below, the generation is split between the analysis above and the remaining is applied below.

Total project savings of Owning Solar, including an annual panel derating of 0.25%, are shown below over the course of the 20 year financing term.

YEAR	kWh GENERATION	20 YEAR SOLAR COST SAVINGS
1	9,523,297	$1,514,186
2	9,515,231	$1,564,349
3	9,507,186	$1,616,414
4	9,499,160	$1,670,460
5	9,491,155	$1,726,571
6	9,490,887	$1,411,826
7	9,475,224	$1,440,523
8	9,467,298	$1,471,020
9	9,459,372	$1,502,161
10	9,451,467	$1,533,964
11	9,443,581	$1,566,442
12	9,435,714	$1,599,609
13	9,427,868	$1,633,482
14	9,420,041	$1,668,074
15	9,412,233	$1,703,401
16	9,404,445	$1,739,478
17	9,396,677	$1,776,322
18	9,388,928	$1,813,949
19	9,381,198	$1,852,375
20	9,373,488	$1,891,618
TOTAL		$32,696,223

Notes:

- Per BPU Rules, no SREC Revenue has been modeled in the CRDA ESIP Project.
- Please see the Incentives section for the details of the Investment Tax Credit Calculation
- System downtime is not included in the solar savings analysis as it is not quantifiable at this time. However, system downtime would have a negative effect on savings.

ECM 3 – LED Lighting Upgrades with Controls

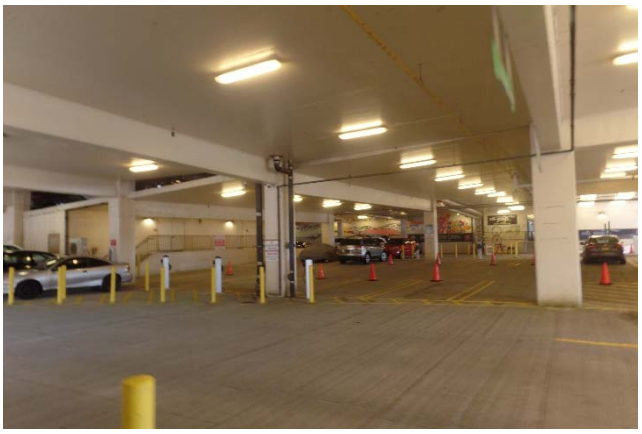
Lighting retrofits and fixture replacements can greatly reduce energy consumption and lower energy bills, while maintaining lighting levels and quality by upgrading lighting components to more efficient and advanced technologies. Upgrading technologies can also offer employees greater control over lighting,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

Retrofitting is typically the least expensive way to transform and upgrade the lighting in a facility. Many offices, government and school facilities utilize 2-to-4-foot tubes as primary lighting type. In these situations, specifying Type B LED Tubes may be most optimal because they have an internal LED driver which allows them to bypass the existing fluorescent ballast in a fixture and wire directly to line voltage. This results in added energy savings as LED T8 tubes that run on a ballast are less efficient. Initial installation takes more time as the ballast wiring needs to be cut out, but long-term, this will also result in maintenance savings as there is no need to replace ballasts.

Fixture Replacements are often the most expensive option, but are also typically the most efficient choice, making them the most cost-effective choice over the lifespan of all products. From simple dimming installations, all the way to sophisticated sensing that can provide real-time feedback on energy usage, occupancy rates, and even operational status, LED fixtures may be able to provide the solution. Fixture Replacements allow for variety and increased customization of specific light color, output, and other features.

Existing Conditions

Existing parking garage lighting at ACCC (left) and WAVE Garage (Right)

Existing interior lighting at BWH and CRDA Office

Scope of Work

Replace a majority of existing interior and exterior fixtures with new LED fixtures as proposed in the line-by-lines in Appendix G. Retrofitting is specified in spaces shown on the line-by-line. The new LED tubes do not require the existing fluorescent ballasts to operate (Type B retrofit). All CRDA sites will be claim rebates through ACE's prescriptive rebate program.

ECM Calculations

BPU Protocols are not appropriate to use for the lighting savings calculations because the protocols do not have the applicable space types and run hours seen in the CRDA. For example, a significant amount of square footage at CRDA is parking garages and the BPU calc does not allow for the "Parking Garage" to be used at 8,760 run hours. Other areas in each of the facilities also are not covered by the BPU Protocol (See Below), where Parking Garages, Event Floors, Meeting Rooms, and other various types of spaces do not have run hours indicated.

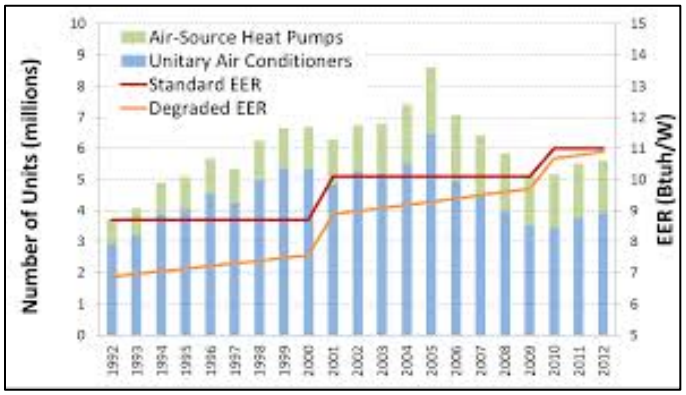
Hours of Operation and Coincidence Factor by Building Type

Building Type	Sector	CF	Hours
Grocery	Large Commercial/Industrial & Small Commercial	0.96	7,134
Medical - Clinic	Large Commercial/Industrial & Small Commercial	0.8	3,909
Medical - Hospital	Large Commercial/Industrial & Small Commercial	0.8	8,760[54]
Office	Large Commercial/Industrial	0.7	2,969
	Small Commercial	0.67	2,950
Other	Large Commercial/Industrial & Small Commercial	0.66	4,573
Retail	Large Commercial/Industrial	0.96	4,920
	Small Commercial	0.86	4,926
School	Large Commercial/Industrial & Small Commercial	0.50	2,575
Warehouse/ Industrial	Large Commercial/Industrial	0.7	4,116
	Small Commercial	0.68	3,799

As such, the results of the energy audit and the notation of run hours per space type were used for Lighting Savings. The Lighting LxL can be reviewed in Appendix F. The results of the LXL Savings are as follows:

BUILDING	Total Demand Savings (kW)	Total Energy Savings (kWh)
Atlantic City Convention Center	886	3,642,740
Boardwalk & West Hall	206	1,107,279
WAVE Parking Garage	62	540,460
CRDA Office	12	40,324

ECM 5 – Rooftop Unit Replacement



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.

Existing Conditions

CRDA Office – In February 2023, CRDA replaced (9) packaged rooftop units at the CRDA Offices. The savings associated with these replacements are included in the ESIP.

Mark For	Qty	Model Number	Description
RTU 1	1	48GCEM06A2A5-6F0C0	WeatherMaster Gas/Electric Rooftop The following items are included: • Refrigerant Options: Two-Stage Cooling single circu • Voltage: 208-230/3/60 • Unit Size: 5 Tons (06) • Heat Size: Medium Gas Heat • Packaging Options: Standard • Indoor Fan Options: Dir Drive-EcoBlue - Med Static • Electrical Options: Non-Fused Disconnect • Intake / Exhaust Options: Enthalpy Econo w/ Baro Relief • Coil Options: Al/Cu - Al/Cu • Base Unit Controls: Electro-Mechanical Ctl W7220
		Subtotal:	**$6,495.00**
RTU 2	1	48GCEM04A2A5-6F0C0	WeatherMaster Gas/Electric Rooftop The following items are included: • Refrigerant Options: Two-Stage Cooling single circu • Voltage: 208-230/3/60 • Unit Size: 3 Tons (04) • Heat Size: Medium Gas Heat • Packaging Options: Standard • Indoor Fan Options: Dir Drive-EcoBlue - Med Static • Electrical Options: Non-Fused Disconnect • Intake / Exhaust Options: Enthalpy Econo w/ Baro Relief • Coil Options: Al/Cu - Al/Cu • Base Unit Controls: Electro-Mechanical Ctl W7220
		Subtotal:	**$5,075.00**
RTU 3	1	48TCEE08A3D5-6F0J0	Gas Heat Packaged Rooftop Unit The following items are included: • Voltage: 208-230/3/60 • Refrigeration Systems Options: Two-Stage Cooling Models 08-16 with Al/Cu Condenser Coils and with Humidi-MiZer • Unit Size: 7.5 Tons (08) • Packaging Options: Standard Carrier Package • Heat Options: Medium Gas Heat • Indoor Fan Options: Indoor Fan High Static Option Belt Drive • Electrical Options: 2-Speed Indoor Fan (VFD) Controller and Non-Fused Disconnect • Coil Options: E-coated Al/Cu Condenser Coil, E-coated Al/Cu Evaporator Coil • Base unit controls: Electromechanical controls with 2-speed fan and W7220 Economizer Controls. • Intake - Exhaust Options: Enthalpy Economizer with Barometric Relief
		Subtotal:	**$11,950.00**

RTU 4	1	48GCEM04A2A5-6F0C0	WeatherMaster Gas/Electric Rooftop

Internal Use Only:0045714183

			The following items are included: • Refrigerant Options: Two-Stage Cooling single circu • Voltage: 208-230/3/60 • Unit Size: 3 Tons (04) • Heat Size: Medium Gas Heat • Packaging Options: Standard • Indoor Fan Options: Dir Drive-EcoBlue - Med Static • Electrical Options: Non-Fused Disconnect • Intake / Exhaust Options: Enthalpy Econo w/ Baro Relief • Coil Options: Al/Cu - Al/Cu • Base Unit Controls: Electro-Mechanical Ctl W7220
		Subtotal:	**$5,075.00**
RTU 5	1	48FCEM07A2A5-6F0C0	WeatherMaker Gas/Electric Rooftop The following items are included: • Voltage: 208-230/3/60 • Heat Options: Medium Gas Heat • Unit Size: 6 Tons (07) • Refrigerant Options: SIngle Circuit 2 Stage Cooling • Packaging Options: Standard Packaging • Indoor Fan Options: Dir Drive-EcoBlue-Med Static • Electrical Options: Non-Fused Disconnect • Intake / Exhaust Options: Enthalpy Econo w/ Baro Relief • Coil Protection Options: Al/Cu - Al/Cu • Base Unit Controls: Electro-Mechanical Ctl W7220
		Subtotal:	**$6,195.00**
RTU 6	1	48GCEM05A2A5-6F0C0	WeatherMaster Gas/Electric Rooftop The following items are included: • Refrigerant Options: Two-Stage Cooling single circu • Voltage: 208-230/3/60 • Unit Size: 4 Tons (05) • Heat Size: Medium Gas Heat • Packaging Options: Standard • Indoor Fan Options: Dir Drive-EcoBlue - Med Static • Electrical Options: Non-Fused Disconnect • Intake / Exhaust Options: Enthalpy Econo w/ Baro Relief • Coil Options: Al/Cu - Al/Cu • Base Unit Controls: Electro-Mechanical Ctl W7220
		Subtotal:	**$5,950.00**
RTU 7	1	48GCEM05A2A5-6F0C0	WeatherMaster Gas/Electric Rooftop The following items are included: • Refrigerant Options: Two-Stage Cooling single circu • Voltage: 208-230/3/60 • Unit Size: 4 Tons (05) • Heat Size: Medium Gas Heat • Packaging Options: Standard • Indoor Fan Options: Dir Drive-EcoBlue - Med Static • Electrical Options: Non-Fused Disconnect • Intake / Exhaust Options: Enthalpy Econo w/ Baro Relief • Coil Options: Al/Cu - Al/Cu • Base Unit Controls: Electro-Mechanical Ctl W7220
		Subtotal:	**$5,950.00**

RTU 8	1	48FCEM07A2A5-6F0C0	WeatherMaker Gas/Electric Rooftop The following items are included: • Voltage: 208-230/3/60 • Heat Options: Medium Gas Heat • Unit Size: 6 Tons (07) • Refrigerant Options: SIngle Circuit 2 Stage Cooling • Packaging Options: Standard Packaging • Indoor Fan Options: Dir Drive-EcoBlue-Med Static • Electrical Options: Non-Fused Disconnect • Intake / Exhaust Options: Enthalpy Econo w/ Baro Relief • Coil Protection Options: Al/Cu - Al/Cu • Base Unit Controls: Electro-Mechanical Ctl W7220
		Subtotal:	**$6,195.00**
RTU 9	1	48GCEM05A2A5-6F0C0	WeatherMaster Gas/Electric Rooftop The following items are included: • Refrigerant Options: Two-Stage Cooling single circu • Voltage: 208-230/3/60

			• Unit Size: 4 Tons (05) • Heat Size: Medium Gas Heat • Packaging Options: Standard • Indoor Fan Options: Dir Drive-EcoBlue - Med Static • Electrical Options: Non-Fused Disconnect • Intake / Exhaust Options: Enthalpy Econo w/ Baro Relief • Coil Options: Al/Cu - Al/Cu • Base Unit Controls: Electro-Mechanical Ctl W7220
		Subtotal:	**$5,950.00**

ECM Calculations

Energy Savings from the installation of high efficiency rooftop units were calculated using BPU protocols. The calculations are shown below.

Packaged Rooftop Unit Replacement Savings										
BUILDING	**SQFT**	**QUANTITY**	**TONS (each)**	**TONS (TOTAL**	**EERb**	**EERq**	**CF**	**EFLH**	**Demand Savings (kW)**	**Energy Savings (kWh)**
CRDA Office	13,200	2	3	6	13	14	67%	1,131	0	447
		3	4	12	13	14	67%	1,131	1	895
		1	5	5	11	14	67%	1,131	1	1,322
		2	6	12	11	14	67%	1,131	2	3,173
		1	7.5	7.5	11	14	67%	1,131	1	1,983

Electric HVAC Systems

The measurement of energy and demand savings for C/I Efficient HVAC program for Room AC, Central AC, and air cooled DX is based on algorithms. (Includes split systems, air to air heat pumps, packaged terminal systems, water source heat pumps, central DX AC systems, ground water or ground source heat pumps)

Algorithms

Air Conditioning Algorithms:

Demand Savings = (BtuH/1000) X ($1/EER_b$-$1/EER_q$) X CF

Energy Savings = (BtuH/1000) X ($1/EER_b$-$1/EER_q$) X EFLH

Definition of Variables

BtuH = Cooling capacity in Btu/Hour – This value comes from ARI/AHRI or AHAM rating or manufacturer data.

CF = Coincidence Factor – This value represents the percentage of the total load which is on during electric system's Peak Window. This value will be based on existing measured usage and determined as the average number of operating hours during the peak window period.

EFLH = Equivalent Full Load Hours – This represents a measure of energy use by season during the on-peak and off peak periods. This value will be determined by existing measured data of kWh during the period divided by kW at design conditions.

HVAC Baseline Table

Equipment Type	**Baseline = ASHRAE Std. 90.1 - 2007**
Unitary HVAC/Split Systems, Air Cooled	
· <=5.4 tons:	13 SEER
· >5.4 to 11.25 tons	11 EER
· >11.25 to 20 tons	10.8 EER
.> 21 to 63 tons	9.8 EER
>63 Tons	9.5 EER

ECM 6 – Combined Heat & Power

4.4kW Micro-combined CHP

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 leads 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.

Scope of Work

- Provide engineered and stamped drawings including shop drawings, submittals and as-builts.
- Apply for the Interconnection application.
- Furnish and install new equipment housekeeping pad for CHP inside THS boiler room
- Furnish new 4.4 KW CHP and secure on the new pad.
- Furnish and install new thermal load module to interface with buildings space heating.
- Furnish and install all piping for the CHP, load module, tie in to heating loop, and make up water piping.
- Furnish and install gas piping to the new CHP.
- Insulate all newly installed piping.
- Furnish and install all electrical power and control wiring.
- Furnish and install exhaust for the CHP (To the roof)
- Provide startup of the CHP
- Provide certified balancing report.

The following will be installed at Atlantic City Convention Center

- One (1) 4.4kW micro CHP Including:
    - 4.4kW, 208 V, 60 Hz, Single Phase
    - Industrial Natural Gas Engine, EPA Certified
    - Open Protocol Interface

TECHNICAL DATA

Fuel	natural gas: minimum methane number 59 propane: minimum octane number MOZ 92 (EN 589)
Electrical Power	natural gas: 1.2 - 4.4 kW modulating propane: 1.2 - 4.4 kW modulating
Thermal Output	natural gas: 4.0 - 12.5 kW modulating propane: 4.5 - 13.8 kW modulating
Total Input Power	natural gas: 5.9 - 19.0 kW propane: 6.5 - 20.0 kW
Fuel Consumption	natural gas: .21 - .65 therms/hr propane: 0.26 - 0.78 gal/hr
Overall Efficiency	93%
Exhaust Gas Emissions	on-site settings: <250 ppm CO, <30 ppm NOx
Noise Pressure Level	approx. 55 dB (A), in 3.3 ft distance

EXHAUST DATA

Exhaust Gas Temperature	operation: < 180°F (82°C)
Exhaust Gas Pipe	unit can be vented with 3 in. CPVC (schedule 80) pipe max. length: 65 ft. with max. of six 90 degree bends inner diam. 2.76 in (70 mm) outer diam. 2.85 in (75 mm) total drag 0.2 wci (0.5 mbar) max. high pressure (back pressure) 1.2 w.c.i. (3.0 mbar) with wind impact

ELECTRICAL DATA

Voltage/Frequency/Power	230V nominal / 60 Hz / 0.98 - 1.00 power factor ecopower® adapts to the grid phase sequence
Phase Sequence	corresponds to the grid phase sequence

GENERATOR AND INVERTER

Generator	brushless, permanent magnet generator directly flanged to the engine, with water cooling system
Inverter	three-phase inverter with integrated safety monitoring, microcontroller control (singe phase output for North America)

HEATING SYSTEM DATA

Heating Return Temperature	min. 95°F (35°C), max. 140°F (60°C)
Heating Supply Temp. Max.	167°F (75°C)
Pressure Drop at the Plate Heat Exchanger	1.0 psi (0.07 bar) at a flow rate of 211 gal/hour (800 L/h)
Temperature Sensor	standard NTC sensor outdoor, room, supply, return, and storage temperature, depending on the operating mode
Hot Water	adjustable: 41 - 158°F (5 - 70°C) (the factory setting of 140°F (60°C) is recommended

ENGINE DATA

Engine	water-cooled, single cylinder, four stroke piston gas combustion engine, designed for long running time; displacement 16.6 in³ (272cm³)
Speed Range	1,200 - 3,600 RPM (factory max. setting: 3,400 RPM)
Coolant Temperature	operation: 167 - 176°F (75 - 80°C) short-term: 194°F (90°C)
Engine Electronics	control of the gas - air ratio ($\lambda = 1$ - control) and monitoring the engine operation, accomplished by microcontroller

ECM Calculations

The CHP will discharge heating into the hot water heating loop. The CHP is estimated to run at full load for over 2,000 hours per year. Non-displaceable gas use is estimated to be 8% (kitchen appliances, gas-fired RTUs, etc.) during the heating season. The remaining load is available for the CHP. For a more conservative energy savings calculation, the CHP is allowed to run during the heating season only (October through April). The installed CHP will be available year-round and will operate when adequate heating load exists. If necessary, heat can be rejected through a radiator when the full heating load is not required. However, Considering the overall capacity of the hot water plant, the heating load of the convention center and the minor amount of heat rejection by a 4.4 kW CHP, it is very unlikely that any heat would be rejected to the atmosphere.

CHP Input Data		
Number of units	1	
Electrical output	4.4	kW
Thermal output	42,000	BTU/hr
Gas input (HHV)	55,000	Btu/hr
Overall efficiency	87.0%	

		Fuel Usage Without CHP				
Month	Days	Total Gas - Post ECMs (Baseline reduced by 10%)	Proposed Boiler Efficiency	Non-Displaceable Gas Therms (See baseline ACCC Gas Usage)	Displaceable Gas Therms	Displaceable Heat Therms
Jan	31	83,834	87.0%	652	83,182	72,369
Feb	28	57,534	87.0%	517	57,017	49,605
Mar	31	41,175	87.0%	1,051	40,125	34,908
Apr	30	19,388	87.0%	783	18,605	16,186
May	31	2,893	87.0%	1,281	1,612	1,403
Jun	30	0	87.0%	626	-626	-545
Jul	31	0	87.0%	947	-947	-824
Aug	31	0	87.0%	1,533	-1,533	-1,333
Sep	30	0	87.0%	980	-980	-853
Oct	31	48	87.0%	1,032	-984	-856
Nov	30	18,581	87.0%	947	17,634	15,342
Dec	31	49,340	87.0%	966	48,374	42,086
Total:	**365**	**272,792**		**11,314**	**261,479**	**227,487**

4.4 kW Cogen Plant Thermal Operation							
Combined Cogen Run Hours	% Heat Load Displaced by CHP	Total Cogen Hours	Utilized Cogen Heat Therms	Max Cogen Heat Therms	Avoided Boiler Gas Therms	Full Load Run Hours	System Operating Efficiency
494	0%	494	207	207	238	494	87.7%
421	0%	421	177	177	203	421	87.7%
350	0%	350	147	147	169	350	87.7%
216	1%	216	91	91	104	216	87.7%
0	0%	0	0	0	0	0	-
0	0%	0	0	0	0	0	-
0	0%	0	0	0	0	0	-
0	0%	0	0	0	0	0	-
0	0%	0	0	0	0	0	-
0	0%	0	0	0	0	0	-
86	0%	86	36	36	41	86	87.7%
435	0%	435	183	183	210	435	87.7%
2,002	**0.4%**	**2,002**	**841**	**841**	**967**	**2,002**	**104%**

Fuel Usage With CHP			Electric Savings With CHP			
Supplemental Boiler Gas Therms	Cogen Gas Therms	Total Gas	Run Hours	Avg Cogen Plant kW Output	kW Demand Savings	Cogen Electric Generation kWh
82,944	272	83,867	494	4.4	4.4	2,174
56,813	232	57,562	421	4.4	4.4	1,854
39,955	193	41,199	350	4.4	4.4	1,542
18,500	119	19,402	216	4.4	4.4	950
1,612	0	2,893	0	0.0	0.0	0
-626	0	0	0	0.0	0.0	0
-947	0	0	0	0.0	0.0	0
-1,533	0	0	0	0.0	0.0	0
-980	0	0	0	0.0	0.0	0
-984	0	48	0	0.0	0.0	0
17,593	47	18,587	86	4.4	4.4	376
48,164	239	49,370	435	4.4	4.4	1,915
260,512	**1,101**	**272,927**	**2,002**		**4.4**	**8,811**

The NJ Protocol is to follow the National Renewable Energy Laboratory's Combined Heat and Power, The Uniform Methods Project: Methods for Determining Energy-Efficiency Savings for Specific Measures [1]. The product should be all of the below outputs, as applicable:

a. Annual energy input to the generator, HHV basis (MMBtu/yr)
b. Annual electricity generated, net of all parasitic loads (kWh/yr)
c. Annual fossil fuel energy savings from heat recovery (MMBtu/yr)
d. Annual electric energy savings from heat recovery, including absorption chiller sourced savings if chiller installation is included as part of the system installation (kWh/yr)
e. Annual overall CHP fuel conversion efficiency, HHV basis (%)
f. Annual electric conversion efficiency, net of parasitics, HHV basis (%)

ECMs Evaluated but Not Included

The energy conservation measures highlighted in this section were each evaluated during the investment grade audit. Due to high capital costs compared to annual energy savings and district priorities, these measures have not been included in the Energy Savings Plan.

ECM 4 – Energy Management System Upgrade

DCO Energy evaluated replacing the existing pneumatic controls at Boardwalk & West Hall. Due to the high cost and difficult installation, this ECM was not included in the project.

Existing Conditions


Existing pneumatics at Boardwalk & West Hall


Existing pneumatics at Boardwalk & West Hall

Scope of Work

Replace existing pneumatic end devices and control panel with new DDC Devices. Connect DDC end device to new, open-protocol controllers. New controllers to connect to the existing Schneider automation system installed in Boardwalk Hall

ECM 7 – Skylight Repair

CRDA Requested that the repair of the Skylight at Atlantic City Convention Center be evaluated for potential replacement. The repairs had been scoped out and budgeted at $1,500,000. The repairs would address leaking problems and infiltration issues with the existing skylight at ACCC.

Due to the high cost and minimal savings, this ECM was not included in the initial project. However, should contingency dollars become available towards the end of the project, this ECM may be included at a later date.

ENERGY SAVINGS PLAN

SECTION 4 – FINANCIAL ANALYSIS

DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648

Form II – Energy Conservation Measures Summary Form

FORM II

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ENERGY CONSERVATION MEASURES (ECMs) SUMMARY FORM
CASINO REINVESTMENT DEVELOPMENT AUTHORITY
ENERGY SAVINGS IMPROVEMENT PROGRAM

ESCO Name: DCO Energy

Proposed Preliminary Energy Savings Plan (Base Project)		Estimated Installed Hard Costs[1] $	Estimated Annual Savings $	Est. Simple Payback (Years)
ECM Numbe	Energy Conservation Measure			
1	New Chilled Water & Hot Water Central Plant	$24,761,814	$1,352,362	18.3
2	CRDA Owned Solar	$30,518,687	$1,514,186	20.2
3	LED Lighting Replacement with Controls	$4,293,265	$834,430	5.1
5	Packaged Rooftop Unit Replacement	$0	$934	0.0
6	Combined Heating & Power	$135,500	$190	712.3
*Add additional lines as needed**	**Project Summary:**	**$59,709,265**	**$3,702,103**	**16.1**

Optional ECMs *Considered, but not included with base project at this time*		Estimated Installed Hard Costs[1] $	Estimated Annual Savings $	Est. Simple Payback (Years)
ECM Number	Energy Conservation Measure			
4	Energy Management System Upgrade	$3,014,852	$96,635	31.2
7	Skylight Repair	$1,500,000	$0	-
*Add additional lines as needed**	**Optional ECMs Summary:**	**$4,514,852**	**$96,635**	**46.7**

Proposed Energy Related Capital Improvements (Base Project)		Supporting ECM	Estimated Cost $	Percentage of Total Project Cost (Not to Exceed 15%)
ECM Number	Energy Conservation Measure			
*Add additional lines as needed**	**Optional ECMs Summary:**	**-**	**$0**	**0.0**

(1) 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, Profit, etc.

Form V – ESCO Construction and Service Fees

FORM V		
ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP): ESCOs PROPOSED FINAL PROJECT COST FORM FOR BASE CASE PROJECT CASINO REINVESTMENT DEVELOPMENT AUTHORITY 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]	$ 53,121,519	N/A
Construction Contingency	$ 2,390,468	4.50%
Estimated Value of Hard Costs [2]	$ 55,511,988	
Project Service Fees		
Investment Grade Energy Audit	$ 555,120	1.00%
Design Engineering Fees	$ 3,330,719	6.00%
Construction Management & Project Administration	$ 3,441,743	6.20%
System Commissioning	$ 555,120	1.00%
Equipment Initial Training Fees	$ 166,536	0.30%
ESCO Overhead	$ 1,665,360	3.00%
ESCO Profit	$ 2,220,480	4.00%
Project Service Fees Sub Total	$ 8,049,238	14.50%
TOTAL FINANCED PROJECT COSTS:	$ 67,447,065	21.50%
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)*	$444,096	0.80%
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	$444,096	0.80%

DCO Energy Efficiency Division
100 Lenox Drive
Lawrenceville, NJ 08648

Form VI – Project Cash Flow Analysis

FORM VI - 20 Years

ESCO's PRELIMINARY ENERGY SAVINGS PLAN (ESP):
ESCO's PRELIMINARY ANNUAL CASH FLOW ANALYSIS FORM
CASINO REINVESTMENT DEVELOPMENT AUTHORITY - 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): 24 Months
3. Cash Flow Analysis Format:

Miscellaneous Costs Financed:	
Cost of Issuance	$125,000
Total	$125,000

Project Cost[1]: **$67,447,065**
Misc Costs Financed: **$125,000**
Financed Amount: **$67,572,065**

Interest Rate: **3.75%**

Year	Annual Energy Savings	Solar Savings	Operational Savings	Energy Rebates / Incentives [4]	Total Annual Savings	Annual Project Costs	Annual Service Costs[3]	Net Cash-Flow to Client	Cumulative Cash Flow
									$ -
12/31/2025	$ 3,118,615	$ 1,514,186	$ 189,886		$ 4,822,687	$ (4,329,649)	$ (444,096)	$ 48,942	$ 48,942
12/31/2026	$ 2,244,770	$ 1,564,349	$ 189,886	$ 9,099,989	$ 13,098,995	$ (13,050,053)		$ 48,942	$ 97,885
12/31/2027	$ 2,295,462	$ 1,616,414	$ 189,886		$ 4,101,763	$ (4,052,820)		$ 48,942	$ 146,827
12/31/2028	$ 2,347,301	$ 1,670,460	$ 189,886		$ 4,207,648	$ (4,158,705)		$ 48,942	$ 195,770
12/31/2029	$ 2,400,313	$ 1,726,571	$ 189,886		$ 4,316,770	$ (4,267,828)		$ 48,942	$ 244,712
12/31/2030	$ 2,454,524	$ 1,411,826			$ 3,866,349	$ (3,817,407)		$ 48,942	$ 293,654
12/31/2031	$ 2,509,961	$ 1,440,523			$ 3,950,484	$ (3,901,541)		$ 48,942	$ 342,597
12/31/2032	$ 2,566,652	$ 1,471,020			$ 4,037,671	$ (3,988,729)		$ 48,942	$ 391,539
12/31/2033	$ 2,624,625	$ 1,502,161			$ 4,126,786	$ (4,077,844)		$ 48,942	$ 440,482
12/31/2034	$ 2,683,910	$ 1,533,964			$ 4,217,874	$ (4,168,932)		$ 48,942	$ 489,424
12/31/2035	$ 2,744,537	$ 1,566,442			$ 4,310,979	$ (4,262,036)		$ 48,942	$ 538,366
12/31/2036	$ 2,806,535	$ 1,599,609			$ 4,406,145	$ (4,357,202)		$ 48,942	$ 587,309
12/31/2037	$ 2,869,936	$ 1,633,482			$ 4,503,418	$ (4,454,476)		$ 48,942	$ 636,251
12/31/2038	$ 2,934,772	$ 1,668,074			$ 4,602,846	$ (4,553,903)		$ 48,942	$ 685,194
12/31/2039	$ 3,001,075	$ 1,703,401			$ 4,704,475	$ (4,655,533)		$ 48,942	$ 734,136
12/31/2040	$ 3,068,878	$ 1,739,478			$ 4,808,356	$ (4,759,413)		$ 48,942	$ 783,078
12/31/2041	$ 3,138,215	$ 1,776,322			$ 4,914,537	$ (4,865,595)		$ 48,942	$ 832,021
12/31/2042	$ 3,209,122	$ 1,813,949			$ 5,023,071	$ (4,974,128)		$ 48,942	$ 880,963
12/31/2043	$ 3,281,633	$ 1,852,375			$ 5,134,008	$ (5,085,066)		$ 48,942	$ 929,906
12/31/2044	$ 3,355,786	$ 1,891,618			$ 5,247,404	$ (5,198,461)		$ 48,942	$ 978,848
Totals	$ 55,656,622	$ 32,696,223	$ 949,430	$ 9,099,989	$ 98,402,264	$ (96,979,320)	$ (444,096)	$ 978,848	

NOTES:
(1) Includes: Hard costs and project service fees defined in ESCO's PROPOSED "FORM V"
(2) No payments are made by CRDA 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.
(4) As of July 1, 2021, all of former NJ Clean Energy Program incentive programs transitioned over to the investor-owned gas and electric utility companies. Subsequently, the BPU is requiring that all ESIP projects consult with the DCA and follow all DCA guidance regarding the procurement of all subcontractors.

Utility Inflation Details

Per Form VI, the annual inflation rate is 2.2% for electric and 2.4% for natural gas. The inflation rate for Chilled Water was calculated at 2.2% since it is electricity that powers the chilled water system. The inflation rate for Steam/HW was calculated at 2.4% since the fuel used to provide the Hot Water is Natural Gas.

Utility Inflation Worksheet					
Year	ANNUAL ELECTRIC COST SAVINGS	ANNUAL NATURAL GAS COST SAVINGS	ANNUAL CHILLED WATER (Tons/Hr) COST SAVINGS	ANNUAL STEAM/HW (MMBTU) COST SAVINGS	Total
2	$639,017.12	($400,828.70)	$952,072.68	$1,054,509.08	$2,244,770.17
3	$653,075.49	($410,448.59)	$973,018.27	$1,079,817.29	$2,295,462.47
4	$667,443.15	($420,299.35)	$994,424.68	$1,105,732.91	$2,347,301.39
5	$682,126.90	($430,386.54)	$1,016,302.02	$1,132,270.50	$2,400,312.88
6	$697,133.70	($440,715.82)	$1,038,660.66	$1,159,444.99	$2,454,523.53
7	$712,470.64	($451,293.00)	$1,061,511.20	$1,187,271.67	$2,509,960.51
8	$728,144.99	($462,124.03)	$1,084,864.44	$1,215,766.19	$2,566,651.60
9	$744,164.18	($473,215.00)	$1,108,731.46	$1,244,944.58	$2,624,625.22
10	$760,535.79	($484,572.16)	$1,133,123.55	$1,274,823.25	$2,683,910.43
11	$777,267.58	($496,201.90)	$1,158,052.27	$1,305,419.01	$2,744,536.96
12	$794,367.47	($508,110.74)	$1,183,529.42	$1,336,749.06	$2,806,535.21
13	$811,843.55	($520,305.40)	$1,209,567.07	$1,368,831.04	$2,869,936.26
14	$829,704.11	($532,792.73)	$1,236,177.55	$1,401,682.99	$2,934,771.91
15	$847,957.60	($545,579.75)	$1,263,373.45	$1,435,323.38	$3,001,074.68
16	$866,612.67	($558,673.67)	$1,291,167.67	$1,469,771.14	$3,068,877.81
17	$885,678.15	($572,081.84)	$1,319,573.36	$1,505,045.65	$3,138,215.31
18	$905,163.07	($585,811.80)	$1,348,603.97	$1,541,166.74	$3,209,121.98
19	$925,076.65	($599,871.28)	$1,378,273.26	$1,578,154.74	$3,281,633.37
20	$945,428.34	($614,268.19)	$1,408,595.27	$1,616,030.46	$3,355,785.87

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	CRDA
Disposition of Abandoned Equipment (Steam Piping, Condensate Piping, Oil Tanks, etc.)	Risk	CRDA
New Natural Gas Distribution	Risk	DCO
Integrity of re-used Infrastructure	Risk	CRDA
Life Safety System Coordination	Risk	CRDA
Coordination with CRDA Information Technology Department	Risk	CRDA
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
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. CRDA
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 & CRDA
Scope changes relating to requests by Authorities Having Jurisdiction.	Risk	CRDA (via contingency)
Department of Environmental Protection Permitting	Risk	Consulting Engineer

Modifications of Energy Saving Control Sequences and Setpoints impacting Energy Savings and Incentives	Risk	CRDA
Post Construction Calibration of Sensors, Meters, & Safety Devices	Risk	CRDA
Adequate time and access for bidding contractor site surveys	Risk	CRDA
Utility Interconnection approval for the CHP Unit	Risk	DCO

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 below. 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 CRDA, 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	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 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	Based on computer simulation model calibrated with whole-building or end-use 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 during the first year of the energy savings guarantee. CRDA 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 ESP, 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, 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 CRDA 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 CRDA.

Maintenance Plan

Owner Tasks and Responsibilities:

As a general statement, CRDA 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, CRDA 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 CRDA 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:

CRDA will be given specific training on the changes and advancements in the environmental operations and energy savings strategies. CRDA 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

CRDA 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 CRDA' attention for correction.

ENERGY SAVINGS PLAN

SECTION 6 – OPERATION & MAINTENANCE

It is critical to the success of achieving continued energy savings that CRDA develop and implement an Operation and Maintenance Plan. In this section are some recommendations for CRDA 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.

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)

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 Bi-Annual Inspection

1. Perform following inspection and cleaning before starting the tower for the cooling season and during shutdown at end of season.
2. Record and report abnormal conditions, measurements taken, etc.
3. Review logs for operational problems and trends.
4. 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.

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 the CRDA and DCO. If CRDA 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 this document. Both DCO and the CRDA 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 CRDA 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 CRDA.

SAVINGS VERIFICATION

There are events that cause energy savings to change. CRDA 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 CRDA.

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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-Line
APPENDIX G	Local Government Energy Audits

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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 the unknown. Missing or inaccurate Blueprints, deviations from the original blueprints 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

CRDA ESIP Project is carrying $2,390,468 of construction contingency. The use of Contingency by CRDA or DCO Energy will be defined in the Implementation Contract.

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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 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 contingency (See Appendix A).

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

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:

- 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

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.

Year 1 O&M Savings

O&M Savings of $189,886 is being carried in the ESIP each year for the first 5 years of the financing term. This amount is related only to the LED Lighting and CRDA's no longer having to pay to purchase and install replacement lighting.

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:.....3.75 %
Term:.....20 Years
Construction Term.....24 Months
Construction Interest Only Payment of .....TBD by CRDA financial advisor
Annual Surplus of no less than.....$48,942

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 Atlantic City Electric Rebate Program Guidelines. The total ACE incentive amount was calculated to be $212,800. The Prescriptive Rebate Incentives are shown within Form VI of the CRDA Energy Savings Plan

The Investment Tax Credit for the installation of Solar Arrays at Atlantic City Convention Center and Boardwalk & West Hall was calculated at $8,887,189 and was carried in the project financial analysis.

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, CRDA 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 LINE

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APPENDIX G – LOCAL GOVERNMENT ENERGY AUDITS