ENERGY AUDIT – FINAL REPORT

WILDWOOD CREST
CREST PIER COMMUNITY CENTER
5800 OCEAN AVE.
WILDWOOD CREST, NJ 08260
ATTN: MR. KEVIN M. YECCO
Borough Clerk/Administrator

CEG PROJECT NO. 9P09039

CONCORD ENGINEERING GROUP

520 SOUTH BURNT MILL ROAD
VOORHEES, NJ 08043
TELEPHONE: (856) 427-0200
FACSIMILE: (856) 427-6529
WWW.CEG-INC.NET

CONTACTS:
RAYMOND JOHNSON
Cell: (609) 760-4057
rjohnson@ceg-inc.net

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I. EXECUTIVE SUMMARY

This report presents the findings of an energy audit conducted for:

The Borough of Wildwood Crest
Crest Pier Community Center
5800 Ocean Avenue
Wildwood Crest, NJ 08260

Municipal Contact: Mr. Kevin M. Yecco, Clerk / Administrator
Facility Contact: Mr. Michael Velardo, DPW

This audit was performed in connection with the New Jersey Clean Energy Local Government Energy Audit Program. The energy audit is conducted to promote the mission of the office of Clean Energy, which is to use innovation and technology to solve energy and environmental problems in a way that improves the State's economy. This can be achieved through the wiser and more efficient use of energy.

The annual energy costs at this facility are as follows:

Electricity	$ 31,754
Natural Gas	$ 16,637
Total	$ 48,391

The potential annual energy cost savings for each energy conservation measure (ECM) are shown below in Table 1. Be aware that the ECM's are not additive because of the interrelation of some of the measures. This audit is consistent with an ASHRAE level 2 audit. The cost and savings for each measure is ± 20%. The evaluations are based on engineering estimations and industry standard calculation methods. More detailed analyses would require engineering simulation models, hard equipment specifications, and contractor bid pricing.

Table 1
Energy Conservation Measures (ECM's)

ECM NO.	DESCRIPTION	COST [A]	ANNUAL SAVINGS [B]	SIMPLE PAYBACK (YEARS)	SIMPLE ROI
1	Lighting Upgrade - General	$10,027	$2,750	3.6	27 %
2	Install Lighting Controls	$385	$256	1.5	66 %
3	Rooftop Unit Replacement	$67,444	$6,30	9.9	7.9%
4	Programmable Thermostats & Replace Valves	$7,200	$1,538	4.7	22.3%
5	39 KW PV Solar Panel System	$351,900	$24,817	14.2	7.0 %

Notes: A. Cost takes into consideration applicable NJ SmartStart™ incentives and maintenance savings.
B. Savings takes into consideration applicable maintenance savings.

The estimated demand and energy savings are shown below in Table 2. The information in this table corresponds to the ECM's in Table 1.

Table 2
Estimated Energy Savings

ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECT DEMAND (KW)	ELECT CONSUMPTION (KWH)	NAT GAS (THERMS)
1	Lighting Upgrade - General	7.0	15,435	-
2	Install Lighting Controls	-	1,503	-
3	Rooftop Unit Replacement	50.2	40,179	-
4	Programmable Thermostats & Replace Valves	-	1,741	782
5	39 KW PV Solar Panel System	39.1	47,725	-

Recommendations:

Concord Engineering Group recommends the implementation of all ECM's that provide a calculated simple payback at or under Ten (10) years. The following Energy Conservation Measures are recommended for the Wildwood Crest – Crest Pier Community Center:

- **ECM #1:** Upgrade the Lighting
- **ECM#2:** Install lighting Controls
- **ECM#3:** Rooftop Unit Replacement
- **ECM #4:** Programmable Thermostats & replace Valves

In addition to the ECM's, there are maintenance and operational measures that can provide significant energy savings and provide immediate benefit. The ECM's listed above represent investments that can be made to the facility which are justified by the savings seen overtime. However, the maintenance items and small operational improvements below are typically achievable with on site staff or maintenance contractors and in turn have the potential to provide substantial operational savings compared to the costs associated. The following are

recommendations which should be considered a priority in achieving an energy efficient building:

1. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.
2. Maintain all weather stripping on entrance doors.
3. Clean all light fixtures to maximize light output.
4. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

II. INTRODUCTION

This comprehensive energy audit covers the **24,065** square foot Crest Pier Community Center building located at 5800 Ocean Avenue. The building is used for recreational activities and houses several retail stores with a 1090 sq. ft. mezzanine level. The facility is used for a variety of activities, including youth and adult sports programs, senior programs, two- and five-mile runs, gymnastics, dance, Tai Chi, and aerobics classes, youth and adult basketball leagues, toddler programs, tot soccer, grade school dances, and a well renowned summer day camp, wrestling, and basketball leagues. The Annual Scoop Taylor and Island-wide Basketball Tournaments are held at the facility. The facility is heavily used and is a vital part of community life in Wildwood Crest. A popular "Kids Camp" operated out of the building during the busy summer months.

Note: The building square footage was verified after field survey and architectural drawing review. The square footage was incorrectly noted on Application "C" as **10,000** square feet.

Electrical and natural gas utility information is collected and analyzed for one full year's energy use of the building. The utility information allows for analysis of the building's operational characteristics; calculate energy benchmarks for comparison to industry averages, estimated savings potential, and baseline usage/cost to monitor the effectiveness of implemented measures. A computer spreadsheet is used to calculate benchmarks and to graph utility information (see the utility profiles below).

The Energy Use Intensity (EUI) is established for the building. Energy Use Intensity (EUI) is expressed in British Thermal Units/square foot/year (BTU/ft^2/yr), which is used to compare energy consumption to similar building types or to track consumption from year to year in the same building. The EUI is calculated by converting the annual consumption of all energy sources to BTU's and dividing by the area (gross square footage) of the building. Blueprints (where available) are utilized to verify the gross area of the facility. The EUI is a good indicator of the relative potential for energy savings. A low EUI indicates less potential for energy savings, while a high EUI indicates poor building performance therefore a high potential for energy savings.

Existing building architectural and engineering drawings (where available) are utilized for additional background information. The building envelope, lighting systems, HVAC equipment, and controls information gathered from building drawings allow for a more accurate and detailed review of the building. The information is compared to the energy usage profiles developed from utility data. Through the review of the architectural and engineering drawings a building profile can be defined that documents building age, type, usage, major energy consuming equipment or systems, etc.

The preliminary audit information is gathered in preparation for the site survey. The site survey provides critical information in deciphering where energy is spent and opportunities exist within a facility. The entire site is surveyed to inventory the following to gain an understanding of how each facility operates:

- Building envelope (roof, windows, etc.)
- Heating, ventilation, and air conditioning equipment (HVAC)
- Lighting systems and controls
- Facility-specific equipment

The building site visit is performed to survey all major building components and systems. The site visit includes detailed inspection of energy consuming components. Summary of building occupancy schedules, operating and maintenance practices, and energy management programs provided by the building manager are collected along with the system and components to determine a more accurate impact on energy consumption.

III. METHOD OF ANALYSIS

Post site visit work includes evaluation of the information gathered, researching possible conservation opportunities, organizing the audit into a comprehensive report, and making recommendations on HVAC, lighting and building envelope improvements. Data collected is processed using energy engineering calculations to anticipate energy usage for each of the proposed energy conservation measures (ECM's). The actual building's energy usage is entered directly from the utility bills provided by the owner. The anticipated energy usage is compared to the historical data to determine energy savings for the proposed ECM's.

It is pertinent to note, that the savings noted in this report are not additive. The savings for each recommendation is calculated as standalone energy conservation measures. Implementation of more than one ECM may in some cases affect the savings of each ECM. The savings may in some cases be relatively higher if an individual ECM is implemented in lieu of multiple recommended ECM's. For example implementing reduced operating schedules for inefficient lighting will result in a greater relative savings. Implementing reduced operating schedules for newly installed efficient lighting will result in a lower relative savings, because there is less energy to be saved. If multiple ECM's are recommended to be implemented, the combined savings is calculated and identified appropriately.

ECM's are determined by identifying the building's unique properties and deciphering the most beneficial energy saving measures available that meet the specific needs of the facility. The building construction type, function, operational schedule, existing conditions, and foreseen future plans are critical in the evaluation and final recommendations. Energy savings are calculated base on industry standard methods and engineering estimations. Energy consumption is calculated based on manufacturer's cataloged information when new equipment is proposed.

Cost savings are calculated based on the actual historical energy costs for the facility. Installation costs include labor and equipment to estimate the full up-front investment required to implement a change. Costs are derived from Means Cost Data, industry publications, and local contractors and equipment suppliers. The NJ SmartStart Building® program incentives savings (where applicable) are included for the appropriate ECM's and subtracted from the installed cost. Maintenance savings are calculated where applicable and added to the energy savings for each ECM. The costs and savings are applied and a simple payback and simple return on investment (ROI) is calculated. The simple payback is based on the years that it takes for the savings to pay back the net installation cost (Net Installation divided by Net Savings.) A simple return on investment is calculated as the percentage of the net installation cost that is saved in one year (Net Savings divided by Net Installation.)

A simple life-time calculation is shown for each ECM. The life-time for each ECM is estimated based on the typical life of the equipment being replaced or altered. The energy savings is extrapolated throughout the life-time of the ECM. The total energy savings is calculated as the total life-time multiplied by the yearly savings.

IV. HISTORIC ENERGY CONSUMPTION/COST

A. Energy Usage / Tariffs

Electric

Table 3 and Figure 1 represent the electrical usage for the surveyed facility from September-08 to August-09. Atlantic City Electric Utility provides electricity to the facility under the MGS (Monthly General Service) rate. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

Natural Gas

Table 4 and Figure 2 show the natural gas energy usage from August-08 to July-09. South Jersey Gas supplies the natural gas utilizing the GSG rate schedule and delivers the fuel to the burner under the firm transportation rate at the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy. Below is the average unit cost for the utilities at this facility.

Description	Average
Electricity	17.0¢ / kWh (4.97¢ / kBtu)
*Natural Gas	$1.59 / therm (1.59¢ / kBtu)

*Note: The Natural Gas cost per Therm includes customer service charges.

Table 3
Electricity Billing Data

Utility Provider: ACE, Monthly General Service (Main Acct # 0803215-9999-7) (6 Meters)			
MONTH OF USE	**CONSUMPTION KWH**	**DEMAND**	**TOTAL BILL**
Sep-08	21,751	97.08	$4,020
Oct-08	18,681	94.08	$3,419
Nov-08	14,416	64.27	$2,252
Dec-08	13,462	50.68	$2,116
Jan-09	14,957	47.90	$2,326
Feb-09	15,416	44.18	$2,313
Mar-09	13,529	129.85	$2,155
Apr-09	17,264	53.52	$2,617
May-09	12,523	87.65	$1,996
Jun-09	10,367	67.37	$1,704
Jul-09	16,145	99.44	$3,175
Aug-09	18,620	108.41	$3,660
Totals	**187,131**	**129.9 Max**	**$31,754**
AVERAGE DEMAND 78.7 KW average			
AVERAGE RATE $0.170 $/kWh			

Figure 1
Electricity Usage Profile

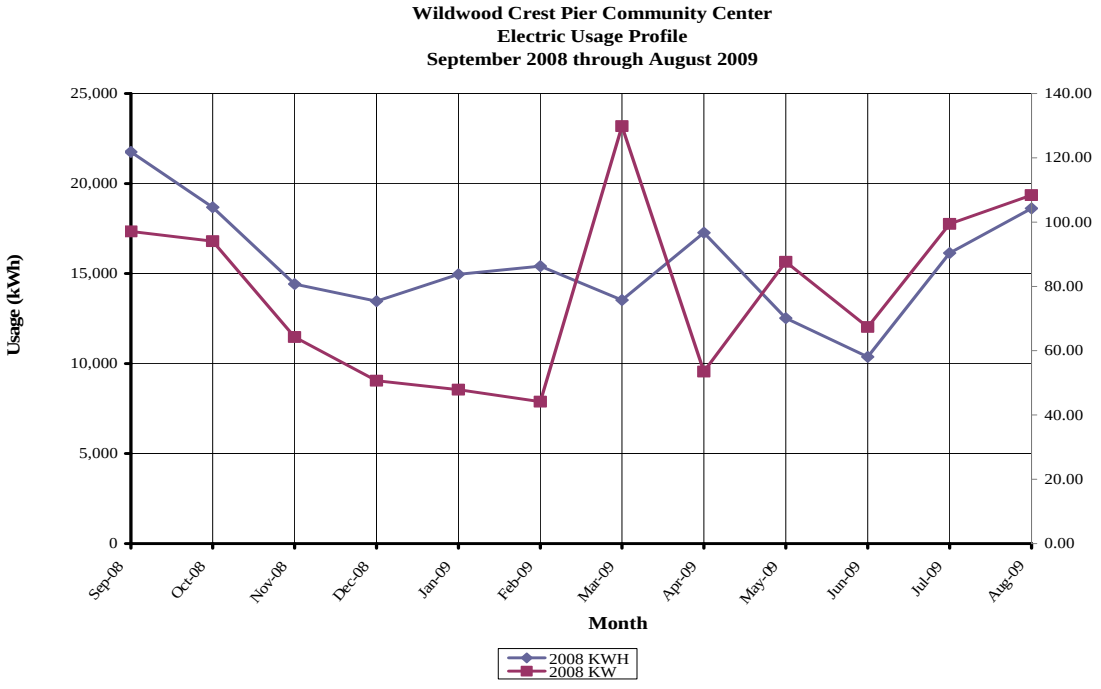
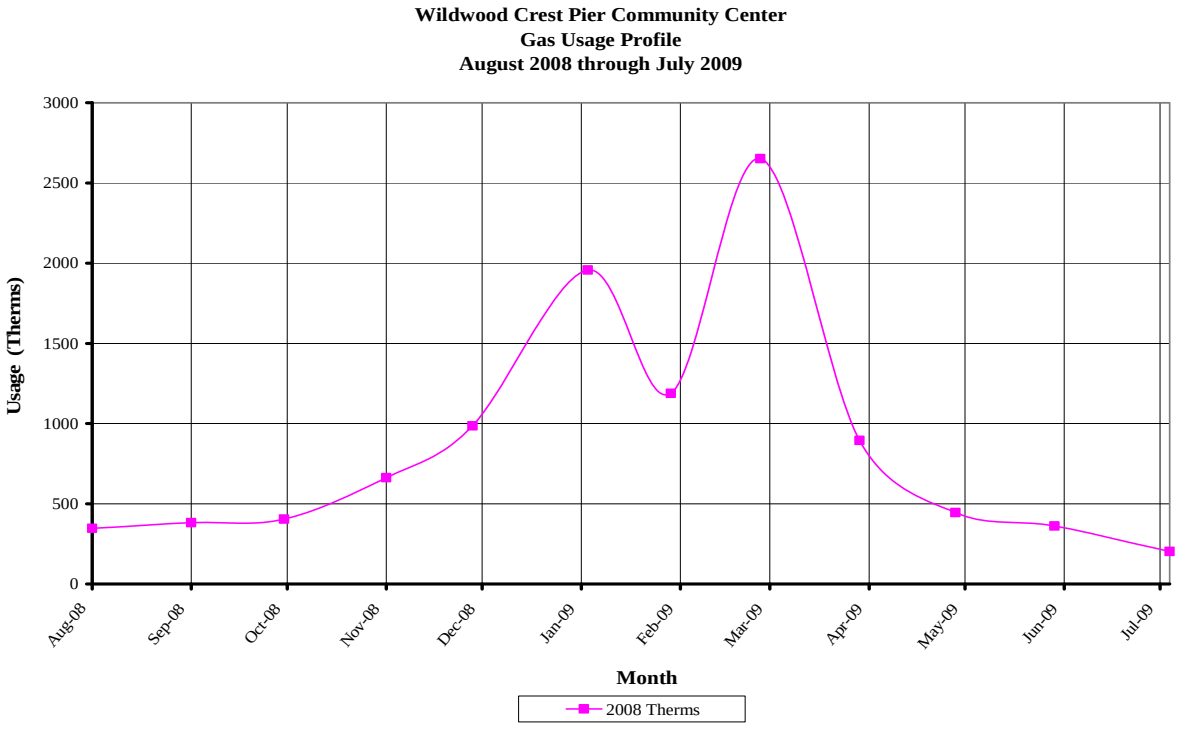


Table 4
Natural Gas Billing Data

Utility Provider: SJ Gas - Rate - GSG, (Meter # 0431142)		
MONTH OF USE	**CONSUMPTION (THERMS)**	**TOTAL BILL**
Aug-08	347.46	$540
Sep-08	382.28	$555
Oct-08	404.54	$539
Nov-08	663.04	$799
Dec-08	986.10	$1,595
Jan-09	1,957.00	$3,187
Feb-09	1,188.86	$1,945
Mar-09	2,651.73	$4,309
Apr-09	894.58	$1,470
May-09	445.05	$743
Jun-09	361.22	$609
Jul-09	203.30	$347
TOTALS	**10,485.16**	**$16,637**
AVERAGE RATE:	**$1.59**	**$/THERM**

Figure 2
Natural Gas Usage Profile



B. Energy Use Intensity (EUI)

Energy Use Intensity (EUI) is a measure of a building's annual energy utilization per square foot of building. This calculation is completed by converting all utility usage consumed by a building for one year, to British Thermal Units (BTU) and dividing this number by the building square footage. EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types. The Oak Ridge National Laboratory (ORNL) Buildings Technology Center under a contract with the U.S. Department of Energy maintains a Benchmarking Building Energy Performance Program. The ORNL website determines how a building's energy use compares with similar facilities throughout the U.S. and in a specific region or state.

Source use differs from site usage when comparing a building's energy consumption with the national average. Site energy use is the energy consumed by the building at the building site only. Source energy use includes the site energy use as well as all of the losses to create and distribute the energy to the building. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses, which allows for a complete assessment of energy efficiency in a building. The type of utility purchased has a substantial impact on the source energy use of a building. The EPA has determined that source energy is the most comparable unit for evaluation purposes and overall global impact. Both the site and source EUI ratings for the building are provided to understand and compare the differences in energy use.

The site and source EUI for this facility is calculated as follows. (See Table 5 for details):

$$Building\ Site\ EUI = \frac{(Electric\ Usage\ in\ kBtu + Gas\ Usage\ in\ kBtu)}{Building\ Square\ Footage}$$

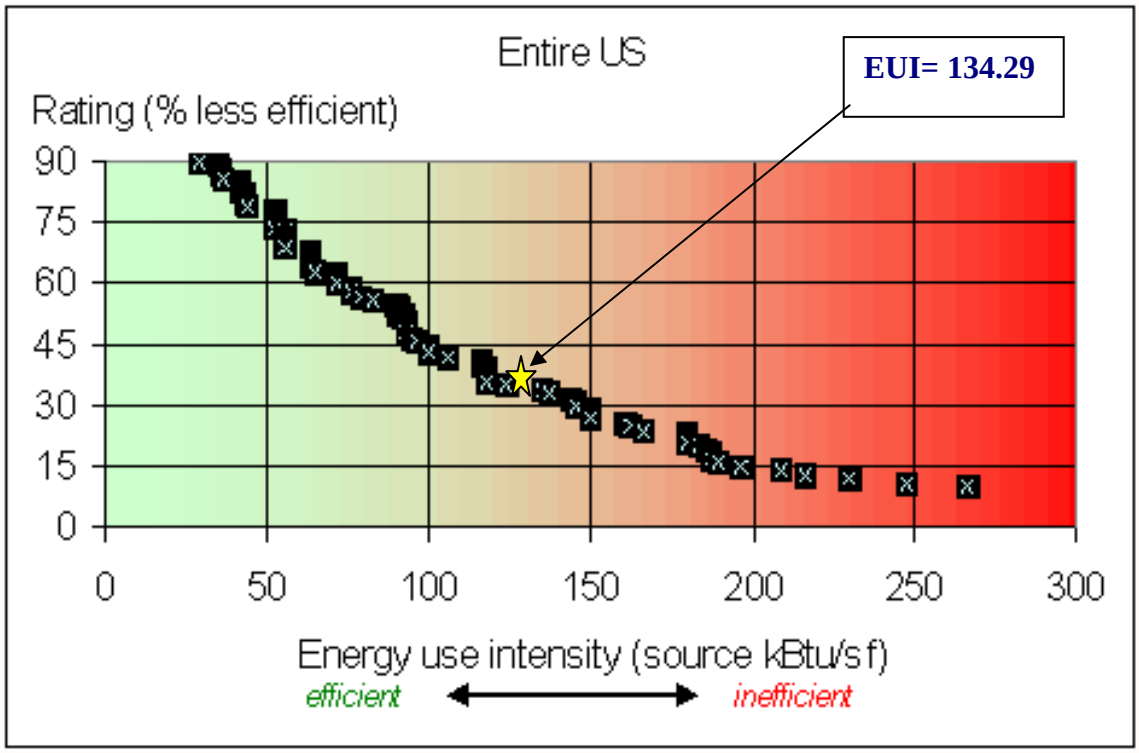
$$Building\ Source\ EUI = \frac{(Electric\ Usage\ in\ kBtu\ X\ SS\ Ratio + Gas\ Usage\ in\ kBtu\ X\ SS\ Ratio)}{Building\ Square\ Footage}$$

Table 5
Crest Pier Community Center EUI Calculations

ENERGY TYPE	BUILDING USE			SITE ENERGY	SITE-SOURCE	SOURCE ENERGY
	kWh	Therms	Gallons	kBtu	RATIO	kBtu
ELECTRIC	187,131			638,865	3.340	2,133,810
NATURAL GAS		10,485.16		1,048,516	1.047	1,097,796
FUEL OIL			0.00	0	1.010	0
PROPANE			0.00	0	1.010	0
TOTAL				1,687,381		3,231,606
*Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.						
BUILDING AREA		24,065		SQUARE FEET		
BUILDING SITE EUI		70.12		kBtu/SF/YR		
BUILDING SOURCE EUI		**134.29**		**kBtu/SF/YR**		

Figure 3 below depicts a national EUI grading for the source use of recreational buildings.

Figure 3
Source Energy Use Intensity Distributions – Recreational



C. EPA Energy Benchmarking System

The United States Environmental Protection Agency (EPA) in an effort to promote energy management has created a system for benchmarking energy use amongst various end users. The benchmarking tool utilized for this analysis is entitled Portfolio Manager. The Portfolio Manager tool allows you to track and assess energy consumption via the template forms located on the ENERGY STAR website (www.energystar.gov). The importance of benchmarking for local government municipalities is becoming more important as utility costs continue to increase and more emphasis is being placed throughout multiple arenas on carbon reduction, greenhouse gas emissions and other environmental impacts.

Based on information gathered from the ENERGY STAR website, Government agencies spend more than $10 billion a year on energy to provide public services and meet constituent needs. Furthermore, energy use in commercial buildings and industrial facilities is responsible for more than 50 percent of U.S. carbon dioxide emissions. Therefore, it is vital that local government municipalities assess their energy usage, benchmark this usage utilizing Portfolio Manager, set priorities and goals to lessen their energy usage and move forward with these priorites and goals. Saving energy will in-turn save the environment.

In accordance with the Local Government Energy Audit Program, CEG has created an Energy Star account for the municipality in order to allow access to monitor their yearly energy usage as it compares to facilities of similar type. The login page for the account can be accessed at the following web address; the username and password are also listed below:

https://www.energystar.gov/istar/pmpam/index.cfm?fuseaction=login.login

User Name:	wildwoodcrestboro
Password:	lgeaceg09012
Security Question:	What is your birth city?
Security Answer:	“Wildwood Crest”

Utilizing the utility bills and other information gathered during the energy audit process, CEG entered the respective data into Portfolio Manager and the following is a summary of the results:

Table 6
ENERGY STAR Performance Rating

FACILITY DESCRIPTION	ENERGY PERFORMANCE RATING	NATIONAL AVERAGE
Crest Pier Community Ctr	N/A	N/A

* N/A Due to building category, see below.

Specific building types are detailed on the ENERGY STAR website. Non-typical buildings are covered by an "Other" category. The "Other" category is used if your building type or a section of the building is not represented by one of the specific categories. An Energy Star Performance Rating cannot be calculated if more then 10% of a building is classified as "Other," or if the building is an office with less than 5,000 square feet of floor space.

Due to the square footage space designation of this multi-use facility being classified mostly as "Other" category, an Energy Star Performance Rating could not be calculated. Despite this, the Portfolio Manager calculates the Building Source Energy Use Intensity (EUI).

The (EUI) is also an important tool that can be used to track the energy efficiency of the building. Baselines for improvement can be set that the municipality can strive to meet. CEG recommends that the Borough of Wildwood Crest keep their Portfolio Manager account up to date to monitor the performance of the building.

The EUI calculated in the previous section and in the Energy Star Portfolio Manager is a good indicator of the energy performance of the Crest Pier Community Center in the absence of the Energy Star Performance Rating.

The EUI distribution, Figure 3, is specific for Recreational Buildings across the country. The Crest Pier Community Center has a Building Source EUI of 134.29 rating for this type of facility and the multiple use, retail, concession, etc., would partially explain the higher rating as compared to other recreational buildings. The lower the EUI the less energy the facility uses per squarefoot. A low EUI indicates a more efficient building. There maybe some opportunity for improvement making the facility more energy efficient and saving more on the utility costs.

Refer to Appendix D for detailed energy benchmarking report entitled "STATEMENT OF ENERGY PERFORMANCE."

V. FACILITY DESCRIPTION

The Crest Pier, built in 1987, serves as Wildwood Crest's community center and features a large Gymnasium / Multipurpose room with a small stage-like platform and basketball hoops, Men's and women's restroom and shower areas, a lobby/multipurpose area, three smaller meeting rooms, a wrestling room, and four retail stores on the Heather Road (North) side of the building. The retail stores presently house the Wildwood Crest Historical Society and a Hair Salon, another is vacant and one is used for storage. A mezzanine level exists at the east end and overlooks the gymnasium room.

9-18-2009 PHOTO OF CREST PIER

The Crest Pier is a single story slab with a pre-engineered steel main structure at its core and a combination of CMU, wood and steel components. Although the building single story the main Gym room is approximately 35 ft. high at its peak. The roof is a shingled 12/ 4 pitch , with 25 ft wide flat sections on the north and south ends. Mechanical equipment is installed on the flat roof areas. Then building has a large percentage of window area arranged in a storefront fashion. The windows are original insulated double pane vinyl, belived to be Anderson brand.

MAIN GYMNASIUM ROOM

Heating and Cooling Systems

The Heating, Cooling and Ventilation systems for this facility consist of fourteen packaged gas-electic rooftop units with variing capacities from 5 through 20 tons each. (118 tons total cooling capacity) The rooftop units are standard commercial grade with standard (minimum) efficiency ratings of the late 1980's. The units are all single zone, thermostats, ducted supply and return with constant volume supply fans. Eleven of the fourteen are original to the building and are well past their expected lifetime, as evidennced by visible corrosion. One unit, serving the main lobby, is new, installed in 2006. Two others are 1999 vintage.

ROOFTOP UNITS CREST PIER

The two systems that serve the gymnasium have rooftop supply and return ductwork. This ductwork is installed approximately 4" above the rooftop. This condition makes it impossible to access the roof in these areas and also allows for debris and birds to collect underneath it. This is an unfortunate situation as the roof is leaking and in need of replacement soon.

HCU-13 ROOFTOP DUCTWORK

In addition, a hydronic heating system exists to account for perimeter envelope loads. A cast iron, atmospheric draft, Wiel McLain boiler and circulating pumps provide hot water to perimeter baseboard finned-tube units. The finned tube units are equipped with zone thermostats and two-way control valves. Many of the control valve are reportedly not functioning. The finned-tube in the vestibules do not have control, they run at full flow regardless of need, often overheating. This sytem is shut off in the summer months.

Each zone is provided with two thermostats, one for heating and the other for cooling. The thermostats are non-programmable manual type. The presence of separate heating and cooling thermostats has potential for simultaneous heating and cooling.

Domestic Hot Water

A gas-fired Hot Water Heater, located in the mechanical room is a minimum efficiency, State brand SBT 80, 750,000 Btuh input. It is 1997 vintage and has a life expectancy of 3 more years.

Lighting System

Several fixture types are used to light the interior of the building. Typical lighting throughout the building uses primarily fluorescent tube fixtures with T-12 lamps and magnetic ballasts. Pendant hung dimmable fixtures are used in the multipurpose rooms and vestibules. The gym is lit by pendant mounted metal halide fixtures. Standard switching and "A/B" switching are used. "A/B" switching allows the occupant the ability to control approximately 50% of the lighting in an area with one switch and the remaining 50% with a separate switch if increased light levels are needed. A dimming panel is also utilized for lighting control.

The exterior lighting uses a mixture of high intensity discharge wall mounted and pole mounted fixtures.

Refer to Appendix E for a detailed Investment Grade Lighting Audit.

VI. MAJOR EQUIPMENT LIST

Following the completion of the field survey a detailed equipment list was created. The equipment within this list is considered major energy consuming equipment whose replacement could yield substantial savings. In addition, the list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment if a manufacturers date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Equipment denoted by an asterisk indicates an estimate of the equipment ratings due to equipment inaccessibility, worn nameplates, lack of nameplates, etc.

Refer to Appendix C for the Major Equipment List for this facility.

VII. ENERGY CONSERVATION MEASURES (ECM)

ECM #1: Lighting Upgrade - General

Description:

CEG recommends replacement of the existing T12 lamps and ballasts with the latest technology T8 lamps and high efficiency electronic ballasts. The new energy efficient T8 lamps will provide adequate lighting and will save electrical costs due to improved performance of the lamps and ballasts. Maintenance savings will be realized by reducing the number of lamps replaced per year. The expected lamp life of a T8 lamp is approximately 30,000 burn-hours, in comparison to the existing T12 lamps which are approximately 20,000 burn-hours. The facility will need approximately 33% fewer lamp replacements per year.

Also, single electronic ballasts can operate up to four lamps, while the existing magnetic ballasts can only operate up to two lamps. The number of ballasts in the facility could be reduced by "tandem wiring" electronic ballasts. Single electronic ballasts may be wired to operate up to four lamps in two or more fixtures.

Existing egress fixture lamp replacement shall be excluded from this ECM so that the current egress light levels are maintained.

The facility was partially occupied by staff during the field survey. It was noted during the survey that the facility staff appears to actively practice manual lighting control energy conservation. Lighting in areas that were not being utilized was switched "off". Accordingly, although the facility operation hours were reported to be between 60-80 hours per week, lighting energy usage of many areas of the building may not reflect this estimate. The light fixture "usage hours per year" indicated in Appendix E have been adjusted by room/area to account for this observation. Also, the "usage hours per year" are estimates based on current, historic, and projected future occupancy rates for the facility.

Dimmable replacement fixtures were evaluated to replace the existing pendant mounted and recessed incandescent fixtures in the multi-purpose room and entry vestibule, but are not recommended as part of this ECM. The fixtures are located in an area with a significant amount of daylight available and are not typically illuminated during daylight hours. Fixture cost, relatively low annual lamp "burn hours" and dimming utilized by facility staff, combine to produce an extended payback period.

Energy Savings Calculations:

A detailed Investment Grade Lighting Audit can be found in Appendix E that outlines the proposed retrofits, costs, savings, and payback periods.

NJ Smart Start® Program Incentives are calculated as follows:

From the Smart Start Incentive appendix, the replacement of a T-12 fixture to a T-5 or T-8 fixture warrants the following incentive: (1-2 lamp) = $10 per fixture; (3-4 lamp) = $20 per fixture.

Smart Start Incentive = *(# of 1-2 lamp fixtures x $10) + (# of 3-4 lamp fixtures x $20)*

Smart Start Incentive = *((52) 1-2 lamp fixtures x $10 + ((93)-3-4 lamp fixtures x $20) = $2,380*

Maintenance Savings are calculated as follows:

Maintenance Savings = *(reduction in lamps replaced per year) x (replacement $ per lamp + labor $ per lamp)*

Maintenance Savings = *(18 lamps per year) x ($2.00 + $5.00) =$126*

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	**$12,407**
NJ Smart Start Equipment Incentive ($):	**($2,380)**
Net Installation Cost ($):	**$10,027**
Maintenance Savings ($ / yr):	**$126**
Energy Savings ($ / yr):	**$2,624**
Net Savings ($ / yr):	**$2,750**
Simple Payback (yrs):	**3.6**
Simple Return On Investment (%):	**27 %**
Simple Lifetime ROI (%):	**2.4 %**
Estimated ECM Lifetime (yr):	**11.8**
Simple Lifetime Savings ($):	**$32,450**

- ECM#1 Calculations DO NOT include lighting control changes implemented in ECM#2.
- If ECM#1 and #2 are implemented together the savings will be relatively lower than shown above.

ECM #2: Install Lighting Controls

Description:

Install Lighting Controls to Reduce the Lighting Use

In some areas the lighting is left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in storage rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas. Photocell control senses light levels and turn off or reduce lights when there is adequate daylight. Photocells are mostly used outside, but are becoming more popular in energy-efficient interior lighting designs as well.

ASHRAE Standard 90.1-2004, Appendix G is a reference standard for modeling building efficiency. The standard estimates that lighting controls provide a 10% reduction in lighting power usage for daytime occupancies in buildings over 5,000 SF, and 15% reduction in buildings under 5,000 SF.

CEG would recommend the replacement of standard wall switches with sensor wall switches for individual rooms, ceiling mount sensors for large office areas or restrooms, and fixture mount box sensors for some applications. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent.

The "Investment Grade Lighting Audit" appendix of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by 10% for all areas that include occupancy sensor lighting controls.

Energy Savings Calculations:

Energy Savings = *Total kilowatt Hours per year (kWh/yr) of Occupancy Sensor Controlled Area x Average Electric Cost ($/kWh) x 10% Energy Savings:*

= 15,030 kwh/yr. x $0.17/kWh x 10%

Annual Savings = $256 / yr

Installation cost per dual-technology sensor (Basis: Sensorswitch or equivalent) is $75/unit including material and labor.

Installation Cost = $75 x 7 motion sensors = $525

NJ Smart Start® Program Incentives are calculated as follows:

From the NJ Smart Start appendix, the installation of a lighting control device warrants an incentive of $20 per occupancy sensor.

Smart Start Incentive = *(# of Occupancy Sensors x $20)*

Smart Start Incentive = *(7 x $20) = $140*

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	**$525**
NJ Smart Start Equipment Incentive ($):	**($140)**
Net Installation Cost ($):	**$385**
Maintenance Savings ($ / yr):	**$0**
Energy Savings ($ / yr):	**$256**
Net Savings ($ / yr):	**$256**
Simple Payback (yrs):	**1.5**
Simple Return On Investment (%):	**66 %**
Simple Lifetime ROI (%):	**9 %**
Estimated ECM Lifetime (yr):	**15**
Simple Lifetime Savings ($):	**$3,840**

* ECM#2 Calculations DO NOT include lighting changes implemented in ECM#1. If ECM#1 and #2 are implemented together the savings will be relatively lower than shown above.

ECM #3: Rooftop Unit Replacement

Description:

The eight (8) 5 ton and two (2) 6-1/2 ton rooftop units are aged and beyond there useful life. Regardless of energy savings, their replacement is needed. The units, made in 1995 by Rheem, had an efficiency rating of 9 EER when new. Due to the age and wear, the estimated efficiency is 9 EER today.

The two (2) 20 ton rooftop units serving the gymnasium area are 10 years old and have 5 years left on their expected useful life. These units, made in 1999, have an efficiency of 9.7 EER when new. Due to the age and wear, the estimated efficiency is 8 EER today.

This ECM includes replacing the 5 ton and 6-1/2 ton Rooftop units with equivalent capacity but greater energy efficiency. The ECM calculations are based on new Lennox "Energence" rooftop units with efficiencies of 12.5 EER cooling.

Heating Season Heating Degree Days =4,888 HDD
Cooling Season Full Load Cooling Hrs. = 800 hrs/yr.
Average Cost of Electricity = $0.170/kWh

Total Rated Cooling Capacity = 93 Tons
Existing System Efficiency = 8 EER
Proposed System Efficiency = 12.5 EER

Energy Savings Calculations:

Cooling Savings Calculation:

$$EnergySavings = \frac{Cooling(Tons) \times 12{,}000\left(\frac{Btu}{Ton\ hr}\right)}{1000\left(\frac{Wh}{kWh}\right)} \times \left(\frac{1}{EER_{OLD}} - \frac{1}{EER_{NEW}}\right) \times Full\ Load\ Hrs.$$

$$EnergySavings = \frac{93\,(Tons) \times 12{,}000\left(\frac{Btu}{Ton\ hr}\right)}{1000\left(\frac{Wh}{kWh}\right)} \times \left(\frac{1}{8\left(\frac{Btu}{W}\right)} - \frac{1}{12.5\left(\frac{Btu}{W}\right)}\right) \times 800\ hours$$

$= 40{,}179\ kWh$

$$Demand\ Savings = \frac{Energy\ Savings\,(kWh)}{Hrs\ of\ Cooling}$$

$$Demand\ Savings = \frac{40{,}179\,(kWh)}{800\ Hrs.} = 50.2\ KW$$

$$Cooling\ Cost\ Savings = 40{,}179\,(kWh) \times 0.170\left(\frac{\$}{kWh}\right) = \$6{,}830$$

Installed cost for the twelve rooftop units is estimated at $76,000. Note that this estimate includes the demolition of the existing units.

From the NJ Smart Start® Program appendix, the rooftop unit replacement falls under the category "Unitary AC" and warrants an incentive based on efficiency (EER) at a certain cooling tonnage. The program incentives are calculated as follows:

$$\text{Smart Start®}\ Incentive = \left(Cooling\ Tons \times\ \$/Ton\ Incentive\right)$$
$$= \left(93 Tons \times \$92/Ton\right) = \$8556$$

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$76000
NJ Smart Start Equipment Incentive ($):	($8,556)
Net Installation Cost ($):	*$67,444*
Maintenance Savings ($ / yr):	-
Energy Savings ($ / yr):	*$6,830*
Total Energy Savings ($ / yr):	*$6,830*
Simple Payback (yrs):	*9.9*
Simple Return On Investment (%):	*7.9%*
Estimated ECM Lifetime (yr):	*15*
Simple Lifetime Savings ($):	*$35,006*

ECM#4: Programmable Thermostats and Replace Valves

Description:

Twenty-six standard, manual wall thermostats for the HVAC units provide local control with adjustable settings. These thermostats are non-programmable also do not have unoccupied setback features. There are two thermostats for each zone, one heating, one cooling. This ECM proposes replacing each zones two thermostats with a single heating/cooling programmable type thermostat.

New programmable thermostats are available that utilize programming schedules for occupied and unoccupied times and can be set to vary space temperature at these respective times. In addition, the programmable thermostats can be used in conjunction with a motion sensor. When the space is not occupied the equipment can operate at the unoccupied set-point. Once the space becomes occupied the motion sensor sends a signal to the thermostat to raise the temperature of the space to the occupied set-point. This control system approach is ideal for facilities with intermittent occupancy.

This energy conservation measure would replace the various HVAC unit thermostats with programmable 7-day thermostats with night time setback control. The recommended thermostat set-points are as follows:

Occupied Heating = 70° F
Unoccupied Heating = 62° F
Occupied Cooling = 78° F
Unoccupied Cooling = 82° F

CEG recommends replacement of the existing remote thermostats with Honeywell RTH7500D 7-day programmable thermostat or equivalent.

Energy Savings Calculations:

The energy savings of a 7-day programmable thermostat was calculated by using Energy Star Life Cycle Cost Estimate software for qualified programmable thermostats. The referenced calculator can be found at www.energystar.gov. (see Appendix G for Crest Pier Calculation)

Calculated energy savings heating = $1242 / yr.
Calculated energy savings cooling = $ 296 / yr.
$1538 / yr.

Energy may also be saved since it will not be possible to have heating and cooling operating simultaneously. We did not include this savings since it is not known how often this may occur, if at all.

Many of the hydronic baseboard control valves are not functioning. As part of ths ECM we propose replacement of baseboard control valves (13) and addition of control valves for vestibules (2).

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	**$7200**
NJ Smart Start Equipment Incentive ($):	**($0)**
Net Installation Cost ($):	**$7200**
Maintenance Savings ($ / yr):	**($0)**
Energy Savings ($ / yr):	**$1,538**
Net Savings ($ / yr):	**$1,538**
Estimated ECM Lifetime (yrs):	**15**
Simple Lifetime Energy Savings ($):	**$15870**
Simple Payback (yrs):	**4.68**
Simple Return on Investment:	**22.3 %**

VIII. RENEWABLE/DISTRIBUTED ENERGY MEASURES

Globally, renewable energy has become a priority affecting international and domestic energy policy. The State of New Jersey has taken a proactive approach, and has recently adopted in its Energy Master Plan a goal of 30% renewable energy by 2020. To help reach this goal New Jersey created the Office of Clean Energy under the direction of the Board of Public Utilities and instituted a Renewable Energy Incentive Program to provide additional funding to private and public entities for installing qualified renewable technologies. A renewable energy source can greatly reduce a building's operating expenses while producing clean environmentally friendly energy. CEG has assessed the feasibility of installing renewable energy technologies for the Wildwood Crest Pier Community Center, to evaluate if there is any potential for solar or wind energy generation.

Solar energy produces clean energy and reduces a building's carbon footprint. This is accomplished via photovoltaic panels which will be mounted on all south and southwestern facades of the building. Flat roof, as well as sloped areas can be utilized; flat areas will have the panels turned to an optimum solar absorbing angle. (A structural survey of the roof would be necessary before the installation of PV panels is considered). Parking lots can also be utilized for the installation of a solar array. A truss system can be installed that is high enough to park a vehicle under the array, this way no parking lot area is lost. The state of NJ has instituted a program in which one Solar Renewable Energy Certificate (SREC) is given to the Owner for every 1000 kWh of generation. SREC's can be sold anytime on the market at their current market value. The value of the credit varies upon the current need of the power companies. The average value per credit is around $350, this value was used in our financial calculations. This equates to $0.35 per kWh generated.

CEG has reviewed the existing roof area of the building being audited for the purposes of determining a potential for a roof mounted photovoltaic system. A roof area of 2,500 S.F. can be utilized for a PV system on the building roof. A depiction of the area utilized is shown in Renewable / Distributed Energy Measures Calculation, Appendix F following the financial calculations. Using this square footage it was determined that a system size of 39.1 kilowatts could be installed. The required square footage for a system of this size is approximately 2,500 S.F. and has an estimated kilowatt hour production of 47,725 KWh annually, reducing the overall electric consumption by approximately 25.5%. A detailed financial analysis can be found in Appendix F. This analysis illustrates the payback of the system over a 25 year period. The eventual degradation of the solar panels and the price of accumulated SREC's are factored into the payback.

The proposed photovoltaic array layout is designed based on the specifications for the Sun Power SPR-230 panel. This panel has a "DC" rated full load output of 230 watts, and has a total panel conversion efficiency of 18%. Although panels rated at higher wattages are available through Sun Power and other various manufacturers, in general most manufacturers who produce commercially available solar panels produce a similar panel in the 200 to 250 watt range. This provides more manufacturer options to the public entity if they wish to pursue the proposed solar recommendation without losing significant system capacity.

The array system capacity was sized on available roof space on the existing facility. Estimated solar array generation was then calculated based on the National Renewable Energy Laboratory PVWatts Version 1.0 Calculator. In order to calculate the array generation an appropriate location with solar data on file must be selected. In addition the system DC rated kilowatt (kW) capacity must be inputted, a DC to AC de-rate factor, panel tilt angle, and array azimuth angle. The DC to AC de-rate factor is based on the panel nameplate DC rating, inverter and transformer efficiencies (95%), mismatch factor (98%), diodes and connections (100%), dc and ac wiring(98%, 99%), soiling, (95%), system availability (95%), shading (if applicable), and age(new/100%). The overall DC to AC de-rate factor has been calculated at an overall rating of 81%. The PVWatts Calculator program then calculates estimated system generation based on average monthly solar irradiance and user provided inputs. The monthly energy generation and offset electric costs from the PVWatts calculator is shown in the Renewable/Distributed Energy Measures Calculation appendix.

The proposed solar array is qualified by the New Jersey Board of Public Utilities Net Metering Guidelines as a Class I Renewable Energy Source. These guidelines allow onsite customer generation using renewable energy sources such as solar and wind with a capacity of 2 megawatts (MW) or less. This limits a customer system design capacity to being a net user and not a net generator of electricity on an annual basis. Although these guidelines state that if a customer does net generate (produce more electricity than they use), the customer will be credited those kilowatt-hours generated to be carried over for future usage on a month to month basis. Then, on an annual basis if the customer is a net generator the customer will then be compensated by the utility the average annual PJM Grid LMP price per kilowatt-hour for the over generation. Due to the aforementioned legislation, the customer is at limited risk if they generate more than they use at times throughout the year. With the inefficiency of today's energy storage systems, such as batteries, the added cost of storage systems is not warranted and was not considered in the proposed design.

CEG has reviewed financing options for the owner. Two options were studied and they are as follows: Self-financed and direct purchase without finance. Self-finance was calculated with 95% of the total project cost financed at a 7% interest rate over 25 years. Direct purchase involves the local government paying for 100% of the total project cost upfront via one of the methods noted in the Installation Funding Options section below. Both of these calculations include a utility inflation rate as well as the degradation of the solar panels over time. Based on our calculations the following are the payback periods for the respective method of payment:

PAYMENT TYPE	SIMPLE PAYBACK	SIMPLE ROI	INTERNAL RATE OF RETURN
Self-Finance	14.2 Years	7.0 %	3.2 %
Direct Purchase	14.2 Years	7.0 %	5.6 %

*The solar energy measure is shown for reference in the executive summary ECM table

The resultant Internal Rate of Return indicates that if the Owner was able to "self-finance" the solar project, the project would be slightly more beneficial to the Owner. However, if the Owner was able to work out a Power Purchase Agreement with a third-party and agree upon a decent

base energy rate for kilowatt hour production, the "direct purchase" option could also, prove to be a beneficial route.

In addition to the Solar Analysis, CEG also conducted a review of the applicability of wind energy for the facility. Wind energy production is another option available through the Renewable Energy Incentive Program. Wind turbines of various types can be utilized to produce clean energy on a per building basis. Cash incentives are available per kWh of electric usage. Based on CEG's review of the applicability of wind energy for the facility, it was determined that the average wind speed is not adequate, and the kilowatt demand for the building is below the threshold (200 kW) for purchase of a commercial wind turbine. Therefore, wind energy is not a viable option to implement.

IX. ENERGY PURCHASING AND PROCUREMENT STRATEGY

Load Profile:

Load Profile analysis was performed to determine the seasonal energy usage of the facility. Irregularities in the load profile will indicate potential problems within the facility. Consequently based on the profile a recommendation will be made to remedy the irregularity in energy usage. For this report, the facility's energy consumption data was gathered in table format and plotted in graph form to create the load profile. Refer to the Electric and Natural Gas Usage Profiles included within this report to reference the respective electricity and natural gas usage load profiles.

Electricity:

The Electric Usage Profile demonstrates a fairly flat (consistent) electric load profile. July through September does show a slight increase. But this is common with air conditioner energy consumption. This facility has (14) packaged gas-electric rooftop units with capacities varying from 5 – 20 tons each. The consumption is consistent based on the usage pattern of this facility. It has a Multi-Purpose Room, Gymnasium, Restrooms, Showers, Meeting Rooms, Wrestling Room and (4) retail stores. All of these various operations add to the flat consumption pattern of this facility. A Flatter load profile, will allow for more competitive energy prices when shopping for alternative suppliers.

Natural Gas:

The Natural Gas Usage Profile demonstrates a typical natural gas (heat load) profile. The months (November - March) demonstrate a high natural gas consumption. This is a typical load shape for a heating load. The heat is supplied by (14) fourteen, gas roof-top units with varying capacities from 5 to 20 tons. In addition, a hydronic heating system exists to account for perimeter envelope needs. A Weil McLain boiler exits to provide hot water to perimeter baseboard finned-tube units. This system is shut off in the summer. A gas-fired hot water heater provides domestic hot water for this facility. A base-load shaping (flat) will secure more competitive energy prices when procuring energy through an alternative energy source.

Tariff Analysis:

Electricity:

This facility receives electrical Delivery Service from Atlantic City Electric on a MGS Secondary (Monthly General Service) utility rate. This rate is available at any point of Company's system where facilities of adequate character and capacity exist for the entire electric service requirements of any customer delivered at one point and metered at or compensated to the voltage of delivery. This schedule is not available to residential customers. This service includes the following charges: Delivery Service Charges, Distribution Demand Charges, Reactive Demand Charges, Non-Utility Generation Charges, Societal Benefits Charges, Regulatory Assets Recovery Charges, Transition Bond Charges, Market Transition Charge Tax,

Transmission Demand Charge, Regional Greenhouse Gas Initiative Recovery Charge, and Infrastructure Investment Surcharge.

This facility receives electrical supply service through Atlantic City Electric on a BGS (Basic Generation Service) rate. Since the passing and implementation of the Electricity Discount and Energy Competition Act (EDECA) in 1999, there have been many changes brought about by the deregulation of the electric industry in New Jersey. Since that time, customers in New Jersey have been able to choose their electrical supplier. Customers who do not choose to switch to a Third Party Supplier (TPS), or who leave a TPS to return to their Electric Delivery Company are supplied with Basic Generation Service. Beside the commodity itself, BGS also has the following charges: System Control Charge, CIEP Standby Fee, Transmission Enhancement Charge and Basic Generation Service Charge.

Natural Gas:

This facility is serviced by South Jersey Gas Company (SJG) on its Firm Delivery rate (GSG) General Service Gas from the utility and BGSS (Basic Generation Supply Service) when not being served by a Third Party Supplier (TPS). This Delivery Rate has the following charges: Customer Charge, Delivery Charge, BSC Volume Charge and Commodity Charge under this rate structure. The BGSS Supply rates are designed to recover SJG's cost of gas applicable to customers who purchase gas from SJG. The company earns no profit from BGSS. BGSS consists of (2) two pricing mechanisms: Residential and Commercial customers that use less than 5,000 therms annually and Commercial and Industrial customers that consume at least 5,000 therms annually.

Imbalances occur when Third Party Suppliers (TPS) are used to supply natural gas and full-delivery is not made, and when a new supplier is contracted or the customer returns to the utility.

Note: It is important when utilizing a Third Party Supplier, that an experienced regional supplier is used otherwise, imbalances can occur, jeopardizing economics and scheduling. If the supplier does not deliver they can be placed on a very costly rate. A customer can automatically be put on an alternative supply rate by the utility.

A "firm account" refers to the type of interstate pipeline service that the utility has subscribed for and delivered on behalf of the customer. Much like the telecom industry, the pipeline space (capacity) has been deregulated. The pipeline capacity is broken down into reliability of service. "Firm service" is the highest level of reliability and is the last, in pecking order, for interruption.

Recommendations:

CEG recommends a global approach that will be consistent with all facilities within the township. The primary area for potential improvement is seen in the electric costs. The average price per kWh (kilowatt hour) for all buildings based on 1-year historical average price is $.1294/kWh (this is the average "price to compare" if the client intends to shop for energy). The average price per decatherm for natural gas is $ 11.83 / dth (dth, is the common unit of measure). Energy commodities are among the most volatile of all commodities, however at this point and

time, energy is extremely competitive. The borough could see improvement in its energy costs if it were to take advantage of these current market prices quickly, before energy prices increase. Based on annual historical consumption (September 2008 through August 2009) and current electric rates, the borough could see an improvement in its electric costs of up to 26 % annually. (Note: Savings were calculated using Average Annual Consumption and a variance to a Fixed Average One-Year commodity contract). CEG recommends aggregating the entire electric load to gain the most optimal energy costs. CEG recommends advisement for alternative sourcing and supply of energy on a "managed approach".

CEG's secondary recommendation coincides with the boroughs' natural gas costs. Based on the current market, Wildwood Crest could improve its natural gas costs by up to 26 %. Currently the township is utilizing the services of the utility. CEG recommends advisement on energy prices through an energy advisor. They should also consider procuring energy (natural gas) through an alternative supply source.

CEG also recommends scheduling a meeting with the current utility providers to review their utility charges and current tariff structures for electricity and natural gas. This meeting would provide insight regarding alternative procurement options that are currently available. Through its meeting with the Local Distribution Company (LDC), the municipality can learn more about the competitive supply process. The borough can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at www.nj.gov/bpu. They should also consider using a billing-auditing service to further analyze the utility invoices, manage the data and use the information for ongoing demand-side management projects. Furthermore, special attention should be given to credit mechanisms, imbalances, balancing charges and commodity charges when meeting with the utility representative. The borough should ask the utility representative about alternative billing options, such as consolidated billing when utilizing the service of a Third Party Supplier. Finally, if the supplier for energy (natural gas) is changed, closely monitor balancing, particularly when the contract is close to termination. This could be performed with the aid of an "energy advisor".

X. INSTALLATION FUNDING OPTIONS

CEG has reviewed various funding options for the Owner to utilize in subsidizing the costs for installing the energy conservation measures noted within this report. Below are a few alternative funding methods:

i. *Energy Savings Improvement Program (ESIP)* – Public Law 2009, Chapter 4 authorizes government entities to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. The "Energy Savings Improvement Program (ESIP)" law provides a flexible approach that can allow all government agencies in New Jersey to improve and reduce energy usage with minimal expenditure of new financial resources.

ii. *Municipal Bonds* – Municipal bonds are a bond issued by a city or other local government, or their agencies. Potential issuers of municipal bonds include cities, counties, redevelopment agencies, school districts, publicly owned airports and seaports, and any other governmental entity (or group of governments) below the state level. Municipal bonds may be general obligations of the issuer or secured by specified revenues. Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued, although municipal bonds issued for certain purposes may not be tax exempt.

iii. *Power Purchase Agreement* – Public Law 2008, Chapter 3 authorizes contractor of up to fifteen (15) years for contracts commonly known as "power purchase agreements." These are programs where the contracting unit (Owner) procures a contract for, in most cases, a third party to install, maintain, and own a renewable energy system. These renewable energy systems are typically solar panels, windmills or other systems that create renewable energy. In exchange for the third party's work of installing, maintaining and owning the renewable energy system, the contracting unit (Owner) agrees to purchase the power generated by the renewable energy system from the third party at agreed upon energy rates.

CEG recommends the Owner review the use of the above-listed funding options in addition to utilizing their standard method of financing for facilities upgrades in order to fund the proposed energy conservation measures.

XI. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures with attractive paybacks. These measures are not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Some light fixtures in multi-purpose rooms and meeting rooms were not operational and should be repaired.

E. Provide more frequent air filter changes to decrease overall fan horsepower requirements and maintain better IAQ.

F. Confirm that outside air economizers on the rooftop units that serve the Office Areas are functioning properly to take advantage of free cooling.

In addition to the recommendations above, implementing Retro-Commissioning would be beneficial for this facility. Retro-Commissioning is a means to verify your current equipment is operating at its designed efficiency, capacity, airflow, and overall performance. Retro-Commissioning provides valuable insight into systems or components not performing correctly or efficiently. The commissioning process defines the original system design parameters and recommends revisions to the current system operating characteristics.

APPENDIX

Crest Pier Community Center

CONSTRUCTION COST AND REBATES					
ECM # 1 - UPGRADE THE LIGHTING	Qty	Unit Cost $	Material $	Labor $	Total $
New T-8 & CFL Lamps & Ballasts	1	$571	$571	$1,546	$2,117
Total Cost					$2,117
Utility Incentive					-$580
Total Net Cost					**$1,537**
ECM # 2 - INSTALL LIGHTING CONTROLS	Qty	Unit Cost $	Material $	Labor $	Total $
Occupancy Sensors	24	$75	$1,800	$0	$1,800
Total Cost					$1,800
Utility Incentive					-$480
Total Net Cost					**$1,320**
ECM # 3 - ROOFTOP UNIT REPLACEMENT	Qty	Unit Cost $	Material $	Labor $	Total $
Demo Existing Rooftop Units	12	$250	$0	$3,000	$1,000
New 5 ton RTU	8	$3,500	$28,000	$7,000	$35,000
New 6-1/2 ton RTU	2	$4,000	$8,000	$2,000	$10,000
New 20 ton RTU	2	$12,000	$24,000	$6,000	$30,000
Total Cost					$76,000
Utility Incentive					-$8,556
Total Net Cost					**$67,444**
ECM # 4 - PROGRAMMABLE THERMOSTAT & REPLACE VALVES	Qty	Unit Cost $	Material $	Labor $	Total $
Remove Existing Thermoststs	26	$25	$0	$650	$650
Programmable Thermostat	13	$100	$1,300	$650	$1,950
Replace baseboard control valves	13	$100	$1,300	$1,300	$2,600
Vestibule control valves & thermostats	2	$200	$400	$1,600	$2,000
Total Cost					$7,200
Utility Incentive					$0
Total Net Cost					**$7,200**

Concord Engineering Group, Inc.

520 BURNT MILL ROAD
VOORHEES, NEW JERSEY 08043
PHONE: (856) 427-0200
FAX: (856) 427-6508

SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives as of January, 2009:

Electric Chillers

Water-Cooled Chillers	$12 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Gas Cooling

Gas Absorption Chillers	$185 - $400 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

	$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $93 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250

Ground Source Heat Pumps

Closed Loop & Open Loop	$370 per ton

Gas Heating

Gas Fired Boilers < 300 MBH	$300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$300 - $400 per unit

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps	$60 per hp
Compressors	$5,250 to $12,500 per drive

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons	$50 per unit
Gas-Fired Water Heaters >50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH

Premium Motors

Three-Phase Motors	$45 - $700 per motor

Prescriptive Lighting

T-5 and T-8 Lamps w/Electronic Ballast in Existing Facilities	$10 - $30 per fixture, (depending on quantity)
Hard-Wired Compact Fluorescent	$25 - $30 per fixture
Metal Halide w/Pulse Start	$25 per fixture
LED Exit Signs	$10 - $20 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $284 per fixture

Lighting Controls – Occupancy Sensors

Wall Mounted	$20 per control
Remote Mounted	$35 per control
Daylight Dimmers	$25 per fixture
Occupancy Controlled hi-low Fluorescent Controls	$25 per fixture controlled

Lighting Controls – HID or Fluorescent Hi-Bay Controls

Occupancy hi-low	$75 per fixture controlled
Daylight Dimming	$75 per fixture controlled

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2004 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive

Crest Pier Community Center

EQUIPMENT LIST

TAG	MAKE	MODEL	TYPE	CAPACITY	EFFICIENCY	SERVES	LOCATION	REMAINING USEFUL LIFE	NOTES
B-1	WEIL McLAIN	PFG-6-FN	CAST IRON HOT WATER BOILER	305,000 BTUH INPUT	80%	ENTIRE BUILDING	MECH ROOM	3	1987
P-1	THRUSH	6T-2	IN-LINE CENTRIFUGAL PUMP	1/2 HP MOTOR	35%	PRIMARY CIRCULATING PUMP	MECH ROOM	5	THIS PUMP IS OPERATING
P-2	THRUSH	6T-2	IN-LINE CENTRIFUGAL PUMP	1/2 HP MOTOR	35%	STAND-BY CIRCULATION PUMP	MECH ROOM	0	NOTE: PUMP IS VALVED CLOSED AND NON-FUNCTIONAL. A NEW REPLACEMENT PUMP IS IN THE MECH ROOM, NOT INSTALLED
FTR	GENERIC	-	HYDRONIC FINNED-TUBE BASEBOARD HEAT	-	-	ENTIRE BUILDING	PERIMETER	5	
EBB	GENERIC	-	ELECTRIC BASEBOARD HEAT	-	100%	MUNTIPURPOSE ROOM	PERIMETER	5	
HCU-1	SNYDER GENERAL (McQUAY)	PGDB-060	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	5 TONS COOLING, 150 MBH HEAT	9 EER	RETAIL -STORAGE	ROOF - NORTH SIDE	0	
HCU-2	SNYDER GENERAL (McQUAY)	PGDB-060	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	5 TONS COOLING, 150 MBH HEAT	9 EER	RETAIL - VACANT	ROOF - NORTH SIDE	0	
HCU-3	SNYDER GENERAL (McQUAY)	PGDB-060	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	5 TONS COOLING, 150 MBH HEAT	9 EER	RETAIL - HAIR STYLIST	ROOF - NORTH SIDE	0	
HCU-4	SNYDER GENERAL (McQUAY)	PGDB-060	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	5 TONS COOLING, 150 MBH HEAT	9 EER	RETAIL - HISTORICAL SOCIETY	ROOF - NORTH SIDE	0	
HCU-5	SNYDER GENERAL (McQUAY)	PGDB-060	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	5 TONS COOLING, 150 MBH HEAT	9 EER	WRESTLING ROOM	ROOF - NORTH SIDE	0	GAS NOT CONNECTED. GAS CONNECTION IS PENDING
HCU-6	SNYDER GENERAL (McQUAY)	PGDB-060	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	5 TONS COOLING, 150 MBH HEAT	9 EER	MULTI-PURPOSE ROOM	ROOF - NORTH SIDE	0	ELECTRIC BB HEAT
HCU-7	SNYDER GENERAL (McQUAY)	PGDB-080	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	6-1/2 TONS COOLING, 250 MBH HEAT	9 EER	MEETING ROOM	ROOF - SOUTH SIDE	0	
HCU-8	SNYDER GENERAL (McQUAY)	PGDB-080	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	6-1/2 TONS COOLING, 250 MBH HEAT	9 EER	MEETING ROOM	ROOF - SOUTH SIDE	0	
HCU-9	SNYDER GENERAL (McQUAY)	PGDB-080	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	6-1/2 TONS COOLING, 250 MBH HEAT	9 EER	GAME ROOM	ROOF - SOUTH SIDE	0	
HCU-10	TRANE	YCH-180	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	15 TONS COOLING, 350 MBH HEAT	9.7 EER	MAIN LOBBY / MULTI-PURPOSE ROOM	ROOF	12	MFG. 2 / 2006
HCU-11	SNYDER GENERAL (McQUAY)	PGDB-060	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	5 TONS COOLING, 150 MBH HEAT	9 EER	MEZZANINE LEVEL	ROOF	0	
HCU-12	YORK	D1HG-240-N320-25TCA	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	20 TONS COOLING, 400 MBH HEAT	9.7 EER	GYMNASIUM	ROOF	5	MFG. 1999
HCU-13	YORK	D1HG-240-N320-25TCA	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	20 TONS COOLING, 400 MBH HEAT	9.7 EER	GYMNASIUM	ROOF	5	MFG. 1999
HCU-14	SNYDER GENERAL (McQUAY)	PGDB-060	PACKAGED ROOFTOP DX ELECTRIC COOLING, GAS HEAT	5 TONS COOLING, 150 MBH HEAT	9 EER	ENTRY-PACIFIC AVE	ROOF	0	
HWH	STATE	SBT 80-725	GAS-FIRES STORAGE TYPE HOT WATER HEATER	725 MBH INPUT	80%	ENTIRE BUILDING	MECH ROOM	3	MFG. 1997

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Crest Pier Community Center

Building ID: 1854351
For 12-month Period Ending: August 31, 2009[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: September 24, 2009

Facility
Crest Pier Community Center
5800 Ocean Avenue
Wildwood Crest, NJ 08260

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1992
Gross Floor Area (ft²): 22,975

Energy Performance Rating[2] (1-100) N/A

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	638,190
Natural Gas (kBtu)[4]	1,050,739
Total Energy (kBtu)	1,688,929

Energy Intensity[5]

Site (kBtu/ft²/yr)	74
Source (kBtu/ft²/yr)	141

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	153

Electric Distribution Utility
Atlantic City Electric Co

National Average Comparison

National Average Site EUI	65
National Average Source EUI	136
% Difference from National Average Source EUI	4%
Building Type	Recreation

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Certifying Professional
N/A

Meets Industry Standards[6] **for Indoor Environmental Conditions:**

Ventilation for Acceptable Indoor Air Quality	**N/A**
Acceptable Thermal Environmental Conditions	**N/A**
Adequate Illumination	**N/A**

Notes:
1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Natural Gas values in units of volume (e.g. cubic feet) are converted to kBtu with adjustments made for elevation based on Facility zip code.
5. Values represent energy intensity, annualized to a 12-month period.
6. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.
NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Crest Pier Community Center	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Recreation	Is this an accurate description of the space in question?		☐
Location	5800 Ocean Avenue, Wildwood Crest, NJ 08260	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Retail (Retail)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	4,400 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Weekly operating hours	60 Hours	Is this the total number of hours per week that the retail store is open for business excluding hours when the building is occupied only by maintenance, security, or other support personnel? For buildings with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Number of open or closed refrigeration/freezer cases	0	Is this the total number of commercial refrigeration units (cases) used for the sale or storage of perishable goods? This includes display type refrigerated open or closed cases and cabinets as well as display type freezer units typically found on the sales floor. Each case or cabinet section, typically 4 to 12 feet in length, should be considered 1 unit. Include those cases located inside and immediately adjacent to the facility. This should not include any refrigerated vending (soda) machines.		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of large walk-in refrigeration or freezer units in use within the retail store? This typically includes large refrigeration units located in the back of a retail store in storage and receiving areas and used to store refrigerated goods.		☐
Workers on Main Shift	5	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 15 workers each, the Workers on Main Shift value is 15.		☐

Number of PCs	5	Is this the total number of personal computers and data servers in the retail store? Personal computers are not used to check out customers and are generally located in manager offices, break rooms, and/or storage and inventory areas.		☐
Number of Cash Registers	3	Is this the total number of cash registers in the retail store? Cash registers are defined as business machines that are used primarily for conducting transactions and indicating to customers the amounts of individual sales; they record and total receipts, may automatically calculate the change due, and often include a money drawer from which to make change.		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Percent Cooled	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Exterior Entrance to the Public	Yes	Does this retail store have an exterior entrance to the public? Answer yes if this store has an exterior entrance through which customers enter to shop. Answer no if there is no exterior entrance available to the public.		☐

Crest Pier Community Center (Other)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	12,775 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	2 (Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	80 Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	6 (Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

Lobby / Concession (Other)

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Gross Floor Area	1,000 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	2 (Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	80 Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐

Workers on Main Shift	2 (Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐
Meeting / Exercise (Other)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	3,600 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	3 (Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	60 Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	1 (Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐
Restrooms / Locker / Shower (Other)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	1,200 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Number of PCs	0 (Optional)	Is this the number of personal computers in the space?		☐
Weekly operating hours	80 Hours(Optional)	Is this the total number of hours per week that the space is 75% occupied? This number should exclude hours when the facility is occupied only by maintenance, security, or other support personnel. For facilities with a schedule that varies during the year, "operating hours/week" refers to the total weekly hours for the schedule most often followed.		☐
Workers on Main Shift	1 (Optional)	Is this the number of employees present during the main shift? Note this is not the total number of employees or visitors who are in a building during an entire 24 hour period. For example, if there are two daily 8 hour shifts of 100 workers each, the Workers on Main Shift value is 100.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co

Fuel Type: Electricity

Meter: Electric (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
07/02/2009	08/01/2009	16,145.00
06/02/2009	07/01/2009	10,367.00
05/02/2009	06/01/2009	12,523.00
04/02/2009	05/01/2009	17,264.00
03/02/2009	04/01/2009	13,529.00
02/02/2009	03/01/2009	15,416.00
01/02/2009	02/01/2009	14,957.00
12/02/2008	01/01/2009	13,462.00
11/02/2008	12/01/2008	14,416.00
10/02/2008	11/01/2008	18,681.00
09/02/2008	10/01/2008	21,751.00

Electric Consumption (kWh (thousand Watt-hours))	**168,511.00**
Electric Consumption (kBtu (thousand Btu))	**574,959.53**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))	**574,959.53**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?	☐

Fuel Type: Natural Gas

Meter: Gas (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
07/02/2009	08/01/2009	361.22
06/02/2009	07/01/2009	445.05
05/02/2009	06/01/2009	894.58
04/02/2009	05/01/2009	2,651.73
03/02/2009	04/01/2009	1,188.86
02/02/2009	03/01/2009	1,957.00
01/02/2009	02/01/2009	986.10
12/02/2008	01/01/2009	663.04
11/02/2008	12/01/2008	404.54
10/02/2008	11/01/2008	382.28
09/02/2008	10/01/2008	347.46

Gas Consumption (therms)	**10,281.86**
Gas Consumption (kBtu (thousand Btu))	**1,028,186.00**
Total Natural Gas Consumption (kBtu (thousand Btu))	**1,028,186.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?	☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same as the PE that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Crest Pier Community Center
5800 Ocean Avenue
Wildwood Crest, NJ 08260

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Crest Pier Community Center	
Gross Floor Area Excluding Parking: (ft²)	22,975
Year Built	1992
For 12-month Evaluation Period Ending Date:	August 31, 2009

Facility Space Use Summary

Retail	
Space Type	Retail
Gross Floor Area(ft²)	4,400
Weekly operating hours	60
Number of open or closed refrigeration/freezer cases	0
Number of walk-in refrigeration/freezer units	2
Workers on Main Shift	5
Number of PCs	5
Number of Cash Registers	3
Percent Heated	100
Percent Cooled	100
Exterior Entrance to the Public	Yes

Meeting / Exercise	
Space Type	Other - Social/Meeting
Gross Floor Area(ft²)	3,600
Number of PCs°	3
Weekly operating hours°	60
Workers on Main Shift°	1

Restrooms / Locker / Shower	
Space Type	Other - Other
Gross Floor Area(ft²)	1,200
Number of PCs°	0
Weekly operating hours°	80
Workers on Main Shift°	1

Crest Pier Community Center	
Space Type	Other - Recreation
Gross Floor Area(ft²)	12,775
Number of PCs°	2
Weekly operating hours°	80
Workers on Main Shift°	6

Lobby / Concession	
Space Type	Other - Fast Food
Gross Floor Area(ft²)	1,000
Number of PCs°	2
Weekly operating hours°	80
Workers on Main Shift°	2

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 08/31/2009)	**Baseline** (Ending Date 08/31/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft²)	74	74	235	N/A	65
Source (kBtu/ft²)	141	141	450	N/A	136
Energy Cost					

$/year	$ 48,261.07	$ 48,261.07	$ 154,558.85	N/A	$ 42,674.05
$/ft²/year	$ 2.10	$ 2.10	$ 6.73	N/A	$ 1.86
Greenhouse Gas Emissions					
$MtCO_2e$/year	153	153	490	N/A	135
$kgCO_2e/ft^2$/year	7	7	22	N/A	6

More than 50% of your building is defined as Recreation. This building is currently ineligible for a rating. Please note the National Average column represents the CBECS national average data for Recreation. This building uses X% less energy per square foot than the CBECS national average for Recreation.

Notes:
o - This attribute is optional.
d - A default value has been supplied by Portfolio Manager.

ECM #1: Lighting Upgrade

Crest Pier Community Center

CEG Project #: BS09-012
Project Name : Wildwood Crest - Crest Pier Community Center
Address: 5800 Ocean Avenue
City, State: Wildwood Crest, NJ 08260
Building SF: 24605

Date 09/23/09
kWh Cost $0.170

	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost			Proposed Ltg Control Annual Savings				
Fixture Location	**Usage, Hrs/Yr**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Annual Energy Cost**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Energy Savings, Watts**	**Energy Savings, kWh/Yr**	**Savings/Yr, $**	**Simple Payback, Yrs**	**Unit Cost, Installed**	**Total Cost, Installed**	**Rebate Estimate**	**Ltg Control Description**	***Energy Savings kWh/Yr**	**Savings/ Yr $**	****Unit Cost, Total**	**Simple Payback, Yrs**
First Floor																				
Multi-Purpose Room #1	2550	9	(1)100w A19 Lamp. Dimmable Down Light Fixture 100w	900	$390.15	9	Existing to Remain	900	0	0	$0.00		$0.00	$0.00	$0.00					
	2550	20	(1)100w A19 Lamp. Dimmable Pendant Fixture - 100w	2000	$867.00	20	Existing to Remain	2000	0	0	$0.00		$0.00	$0.00	$0.00					
	2550	6	(1)130w A21 Lamp. Dimmable Pendant Fixture - 130w	780	$338.13	6	Existing to Remain	780	0	0	$0.00		$0.00	$0.00	$0.00					
Multi-Purpose Room #2	2550	12	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	1848	$801.11	12	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	1140	708	1,805	$306.92	2.6	$85.55	$1,026.60	$240.00	Dual Technology Occupancy Sensor	471.2	$80.11	$ 55.00	0.7
Multi-Purpose Room #3	1820	9	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	1386	$428.83	9	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	855	531	966	$164.29	3.6	$85.55	$769.95	$180.00					
	1820	6	(1)100w Par Lamp Track Light - 100w	600	$185.64	6	Existing to Remain	600	0	0	$0.00		$0.00	$0.00	$0.00					
Multi-Purpose Room #4	2550	12	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	1848	$801.11	12	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	1140	708	1,805	$306.92	2.6	$85.55	$1,026.60	$240.00	Dual Technology Occupancy Sensor	471.2	$80.11	$ 55.00	0.7
Toilet Rm	200	1	(2)20w T12 Lamps. 2' Fixture w/Mag. Ballast - 41w	41	$1.39	1	(2)17w T8 Sylvania Lamps #FO17 Sylvania Ballast #QHE 29w	29	12	2	$0.41	166.9	$78.10	$78.10	$10.00					
Corridor	3640	1	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	154	$95.30	1	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	95	59	215	$36.51	1.8	$85.55	$85.55	$20.00					
		10	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	770	$476.48	10	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	480	290	1,056	$179.45	3.8	$79.05	$790.50	$100.00					
		1	(2)35w T12 U-Tube Lamps. 2' Fixture w/Mag. Ballast - 77w	77	$47.65	1	(2)32w T8 Sylvania Lamps #FBO30 Sylvania Ballast #QHE 55w	52	25	91	$15.47	6.0	$102.30	$102.30	$10.00					
Men's Toilet Rm	2550	2	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	154	$66.76	2	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	96	58	148	$25.14	5.5	$79.05	$158.10	$20.00					
		2	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	154	$66.76	2	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	96	58	148	$25.14	5.5	$79.05	$158.10	$20.00					

	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost			Proposed Ltg Control Annual Savings				
Fixture Location	**Usage, Hrs/Yr**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Annual Energy Cost**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Energy Savings, Watts**	**Energy Savings, kWh/Yr**	**Savings/Yr, $**	**Simple Payback, Yrs**	**Unit Cost, Installed**	**Total Cost, Installed**	**Rebate Estimate**	**Ltg Control Description**	***Energy Savings kWh/Yr**	**Savings/ Yr $**	****Unit Cost, Total**	**Simple Payback, Yrs**
		4	(2)35w T12 U-Tube Lamps. 2' Fixture w/Mag. Ballast - 77w	308	$133.52	4	(2)32w T8 Sylvania Lamps #FBO30 Sylvania Ballast #QHE 55w	208	100	255	$43.35	8.5	$102.30	$409.20	$40.00					
Women's Toilet Rm	2550	1	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	77	$33.38	1	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	48	29	74	$12.57	5.5	$79.05	$79.05	$10.00					
		1	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	77	$33.38	1	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	48	29	74	$12.57	5.5	$79.05	$79.05	$10.00					
Office	3640	4	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	308	$190.59	4	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	192	116	422	$71.78	3.8	$79.05	$316.20	$40.00	Dual Technology Occupancy Sensor	112.1	$19.06	$ 55.00	2.9
Storage Rm #1	200	1	(1)60w A19 Lamp - 60w	60	$2.04	1	(1)19w CFL Sylvania Lamp CF19EL/MINI/830 19w	18	42	8	$1.43	7.6	$10.86	$10.86	$0.00					
Meeting Rm #1	1820	4	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	616	$190.59	4	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	380	236	430	$73.02	3.6	$85.55	$342.20	$80.00	Dual Technology Occupancy Sensor	112.1	$19.06	$ 55.00	2.9
Meeting Rm #2	1820	4	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	616	$190.59	4	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	380	236	430	$73.02	3.6	$85.55	$342.20	$80.00	Dual Technology Occupancy Sensor	112.1	$19.06	$ 55.00	2.9
Meeting Rm #3	1820	4	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	616	$190.59	4	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	380	236	430	$73.02	3.6	$85.55	$342.20	$80.00	Dual Technology Occupancy Sensor	112.1	$19.06	$ 55.00	2.9
Meeting Rm #4	1820	4	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	616	$190.59	4	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	380	236	430	$73.02	3.6	$85.55	$342.20	$80.00	Dual Technology Occupancy Sensor	112.1	$19.06	$ 55.00	2.9
Entry/Vestibule	1820	18	(1)100w A19 Lamp. Dimmable Down Light Fixture 100w	1800	$556.92	18	Existing to Remain	1800	0	0	$0.00		$0.00	$0.00	$0.00					
	1820	12	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	924	$285.89	12	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	576	348	633	$107.67	7.7	$79.05	$948.60	$120.00					
Storage Rm #2	1820	8	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	1232	$381.18	8	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	760	472	859	$146.04	3.6	$85.55	$684.40	$160.00					
Gymnasium	1000	2	(1)1000w Metal Halide Pendant Fixture - 1150w	2300	$391.00	2	Existing to Remain	2300	0	0	$0.00		$0.00	$0.00	$0.00					
	1000	10	(1)400w Metal Halide Pendant Fixture - 460w	4600	$782.00	10	Existing to Remain	4600	0	0	$0.00		$0.00	$0.00	$0.00					
Stage	200	9	(1)100w Par Lamp Track Light - 100w	900	$30.60	9	Existing to Remain	900	0	0	$0.00		$0.00	$0.00	$0.00					
Toilet Rm	200	1	(2)20w T12 Lamps. 2' Fixture w/Mag. Ballast - 41w	41	$1.39	1	(2)17w T8 Sylvania Lamps #FO17 Sylvania Ballast #QHE 29w	29	12	2	$0.41	166.9	$78.10	$78.10	$10.00					

	Existing Lt Fixtures					Proposed Lt Fixtures			Proposed Ltg Savings				Proposed Ltg Installation Cost			Proposed Ltg Control Annual Savings				
Fixture Location	**Usage, Hrs/Yr**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Annual Energy Cost**	**Fixt Qty**	**Lighting Fixture Description**	**Total Watts - Location**	**Energy Savings, Watts**	**Energy Savings, kWh/Yr**	**Savings/Yr, $**	**Simple Payback, Yrs**	**Unit Cost, Installed**	**Total Cost, Installed**	**Rebate Estimate**	**Ltg Control Description**	***Energy Savings kWh/Yr**	**Savings/ Yr $**	****Unit Cost, Total**	**Simple Payback, Yrs**
Retail #1	2550	12	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	1848	$801.11	12	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	1140	708	1,805	$306.92	2.6	$85.55	$1,026.60	$240.00					
Retail #2	2550	9	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	1386	$600.83	9	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	855	531	1,354	$230.19	2.6	$85.55	$769.95	$180.00					
Retail #3	2550	9	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	1386	$600.83	9	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	855	531	1,354	$230.19	2.6	$85.55	$769.95	$180.00					
Toilet Rm	200	1	(2)20w T12 Lamps. 2' Fixture w/Mag. Ballast - 41w	41	$1.39	1	(2)17w T8 Sylvania Lamps #FO17 Sylvania Ballast #QHE 29w	29	12	2	$0.41	166.9	$78.10	$78.10	$10.00					
Kitchen	1820	3	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	231	$71.47	3	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	144	87	158	$26.92	7.7	$79.05	$237.15	$30.00					
Stair Corridor	1820	2	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	154	$47.65	2	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	96	58	106	$17.95	7.7	$79.05	$158.10	$20.00					
First Floor Summary		**214**		**30849**	**$10,274**	**214**		**24381**	**6468**	**15063**	**$2,561**	**3.5**		**$11,210**	**$2,210**		**1,503**	**$256**	**$385**	**1.5**
Mezzanine																				
Office	1000	2	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	308	$52.36	2	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	190	118	118	$20.06	6.5	$85.55	$171.10	$40.00					
Office	1000	3	(4)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 154w	462	$78.54	3	(4)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 95w	285	177	177	$30.09	6.5	$85.55	$256.65	$60.00					
Mezzanine	400	5	(2)34w T12 Lamps. 4' Fixture w/Mag. Ballast - 77w	385	$26.18	5	(2)32w T8 Sylvania Lamps #FO32 Sylvania Ballast #QHE 48w	240	145	58	$9.86	35.0	$79.05	$395.25	$50.00					
Storage	200	2	(2)60w T12 Lamps. 8' Industrial Fixture w/Elec. Ballast - 135w	270	$9.18	2	(2)55w Sylvania Lamps FO96 Sylvania Ballast QHE ISL-SC - 88w	176	94	19	$3.20	110.9	$187.20	$374.40	$20.00					
Mezzanine Summary		**12**		**1425**	**$166**	**12**		**891**	**534**	**371.8**	**$63**	**16.3**		**$1,197**	**$170**		**0**	**$0**	**$0**	
	Totals:	**226**		**32274**	**$10,440**	**226**		**25272**	**7002**	**15435**	**$2,624**	**3.8**		**$12,407**	**$2,380**		**1503**	**$256**	**$385**	**1.5**

COMMENTS:

*Based on ASHRAE Standard 90.1-2004, Appendix G.

**Occupancy Sensor unit cost includes a $20 NJ Smart Start incentive per unit.

Project Name: **Crest Pier Community Center**
Location: **Wildwood crest, NJ**
Description: **Photovoltaic System 95% Financing - 25 year**

Simple Payback Analysis

	Photovoltaic System 95% Financing - 25 year
Total Construction Cost	$351,900
Annual kWh Production	47,725
Annual Energy Cost Reduction	$8,113
Annual SREC Revenue	$16,704
First Cost Premium	**$351,900**
Simple Payback:	**14.18** Years

Life Cycle Cost Analysis

Analysis Period (years):	25	Financing %:	95%
Financing Term (mths):	300	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.170**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	7.00%	SREC Value ($/kWh)	$0.350

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	$17,595	0	0	0	$0	0	0	(17,595)	0
1	$0	47,725	$8,113	$0	$16,704	$23,239	$5,114	($3,537)	($21,132)
2	$0	47,486	$8,357	$0	$16,620	$22,870	$5,484	($3,377)	($24,508)
3	$0	47,249	$8,607	$0	$16,537	$22,473	$5,880	($3,209)	($27,717)
4	$0	47,013	$8,866	$0	$16,454	$22,048	$6,305	($3,034)	($30,751)
5	$0	46,778	$9,132	$482	$16,372	$21,592	$6,761	($3,332)	($34,083)
6	$0	46,544	$9,405	$479	$16,290	$21,103	$7,250	($3,137)	($37,220)
7	$0	46,311	$9,688	$477	$16,209	$20,579	$7,774	($2,934)	($40,154)
8	$0	46,079	$9,978	$475	$16,128	$20,017	$8,336	($2,722)	($42,876)
9	$0	45,849	$10,278	$472	$16,047	$19,415	$8,939	($2,501)	($45,377)
10	$0	45,620	$10,586	$470	$15,967	$18,769	$9,585	($2,271)	($47,648)
11	$0	45,392	$10,904	$468	$15,887	$18,076	$10,278	($2,030)	($49,678)
12	$0	45,165	$11,231	$465	$15,808	$17,333	$11,021	($1,780)	($51,459)
13	$0	44,939	$11,568	$463	$15,729	$16,536	$11,818	($1,520)	($52,979)
14	$0	44,714	$11,915	$461	$15,650	$15,682	$12,672	($1,250)	($54,228)
15	$0	44,491	$12,272	$458	$15,572	$14,766	$13,588	($968)	($55,196)
16	$0	44,268	$12,640	$456	$15,494	$13,783	$14,570	($675)	($55,872)
17	$0	44,047	$13,019	$454	$15,416	$12,730	$15,623	($371)	($56,243)
18	$0	43,827	$13,410	$451	$15,339	$11,601	$16,753	($56)	($56,299)
19	$0	43,608	$13,812	$449	$15,263	$10,390	$17,964	$272	($56,027)
20	$0	43,389	$14,227	$447	$15,186	$9,091	$19,263	$612	($55,414)
21	$0	43,173	$14,653	$445	$15,110	$8,283	$17,708	$3,328	($52,086)
22	$0	42,957	$15,093	$442	$15,035	$6,693	$14,572	$8,420	($43,666)
23	$0	42,742	$15,546	$440	$14,960	$0	$0	$30,065	($13,601)
24	$0	42,528	$16,012	$438	$14,885	$0	$0	$30,459	$16,858
25	$0	42,316	$16,493	$436	$14,810	$0	$0	$30,867	$47,726
Totals:		910,493	$218,006	$7,427	$318,673	$352,093	$214,979	$247,259	($939,630)
				Net Present Value (NPV)			**($19,007)**		
				Internal Rate of Return (IRR)			**3.2%**		

Project Name: **Crest Pier Community Center**
Location: **Wildwood crest, NJ**
Description: **Photovoltaic System - Direct Purchase**

Simple Payback Analysis

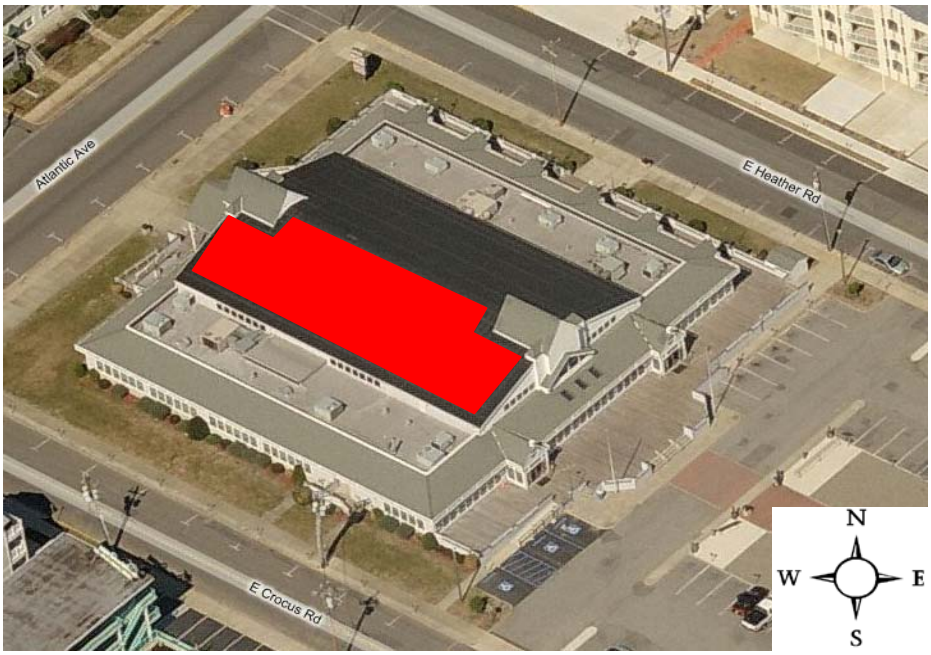
	Photovoltaic System - Direct Purchase
Total Construction Cost	$351,900
Annual kWh Production	47,725
Annual Energy Cost Reduction	$8,113
Annual SREC Revenue	$16,704
First Cost Premium	**$351,900**
Simple Payback:	**14.18** **Years**

Life Cycle Cost Analysis

Analysis Period (years):	25	Financing %:	0%
Financing Term (mths):	0	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.170**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	0.00%	SREC Value ($/kWh)	$0.350

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Net Cash Flow	Cumulative Cash Flow
0	$351,900	0	0	0	$0	(351,900)	0
1	$0	47,725	$8,113	$0	$16,704	$24,817	($327,083)
2	$0	47,486	$8,357	$0	$16,620	$24,977	($302,106)
3	$0	47,249	$8,607	$0	$16,537	$25,144	($276,962)
4	$0	47,013	$8,866	$0	$16,454	$25,320	($251,642)
5	$0	46,778	$9,132	$482	$16,372	$25,022	($226,620)
6	$0	46,544	$9,405	$479	$16,290	$25,216	($201,403)
7	$0	46,311	$9,688	$477	$16,209	$25,420	($175,984)
8	$0	46,079	$9,978	$475	$16,128	$25,631	($150,352)
9	$0	45,849	$10,278	$472	$16,047	$25,853	($124,500)
10	$0	45,620	$10,586	$470	$15,967	$26,083	($98,417)
11	$0	45,392	$10,904	$468	$15,887	$26,323	($72,094)
12	$0	45,165	$11,231	$465	$15,808	$26,573	($45,521)
13	$0	44,939	$11,568	$463	$15,729	$26,833	($18,687)
14	$0	44,714	$11,915	$461	$15,650	$27,104	$8,417
15	$0	44,491	$12,272	$458	$15,572	$27,386	$35,802
16	$0	44,268	$12,640	$456	$15,494	$27,678	$63,480
17	$0	44,047	$13,019	$454	$15,416	$27,982	$91,462
18	$0	43,827	$13,410	$451	$15,339	$28,298	$119,760
19	$0	43,608	$13,812	$449	$15,263	$28,626	$148,386
20	$0	43,389	$14,227	$447	$15,186	$28,966	$177,352
21	$1	43,173	$14,653	$445	$15,110	$29,319	$206,671
22	$2	42,957	$15,093	$442	$15,035	$29,685	$236,357
23	$3	42,742	$15,546	$440	$14,960	$30,065	$266,422
24	$4	42,528	$16,012	$438	$14,885	$30,459	$296,881
25	$5	42,316	$16,493	$436	$14,810	$30,867	$327,748
	Totals:	910,493	$218,006	$7,427	$318,673	$679,648	$529,252
				Net Present Value (NPV)		**$327,773**	
				Internal Rate of Return (IRR)		**5.6%**	

Building	Roof Area (sq ft)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Panel Weight (33 lbs)	W/SQFT
Community Center	2500	Sunpower SPR230	170	14.7	2,500	39.10	47,725	5,610	15.64



.= Proposed PV Layout

PVWatts Version 1 Input Screen

PV System Specifications:

DC Rating (kW):	39.10
DC to AC Derate Factor:	0.81
Array Type:	Fixed Tilt
	1 - Axis Tracking
	2 - Axis Tracking

Fixed Tilt of Single Axis Tracking System:

Array Tilt (degrees):	18
Array Azimuth (degrees):	225

PV Watts Derate Factor for AC Power Rating at STC		
Component Derate Factors	PVWatts Default	Range
PV module nameplate DC rating	1.00	0.80–1.05
Inverter and transformer	0.95	0.88–0.96
Mismatch	0.98	0.97–0.995
Diodes and connections	1.00	0.99–0.997
DC wiring	0.98	0.97–0.99
AC wiring	0.99	0.98–0.993
Soiling	0.95	0.30–0.995
System availability	0.95	0.00–0.995
Shading	1.00	0.00–1.00
Sun-tracking	1.00	0.95–1.00
Age	1.00	0.70–1.00
Overall DC-to-AC derate factor	**0.81**	0.96001–0.09999

Products that earn the ENERGY STAR prevent greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy.
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CHANGE FOR THE BETTER WITH ENERGY STAR

Life Cycle Cost Estimate for 13 ENERGY STAR Qualified Programmable Thermostat(s)

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors.

Enter your own values in the gray boxes or use our default values.

Number of Units	13
Initial Cost per ENERGY STAR Unit (retail price)	$92
Initial Cost per Conventional Unit (retail price)	$73
Unit Fuel Cost (Cooling) ($/kWh)	$0.170
Unit Fuel Cost (Heating) ($/Therm)	$1.59

24 Hour Typical Usage Patterns*

	Weekday	Weekend
Nighttime Set-Back/Set-Up Hours	12	12
Daytime Set-Back/Set-Up Hours	0	0
Hours without Set-Back/Set-Up	12	12

Choose your city from the drop-down menu

City: NJ-Atlantic City

Heating Season*

Typical Indoor Temperature w/o Set-Back	70
Nighttime Set-Back Temperature (Average)	62
Daytime Set-Back Temperature (Average)	62
Heating System Type	Gas Boiler

Cooling Season*

Typical Indoor Temperature w/o Set-Up	78
Nighttime Set-Up Temperature (Average)	82
Daytime Set-Up Temperature (Average)	82
Cooling System Type	Central AC

**All temperatures are in degrees Fahrenheit. Setpoint is defined as the temperature setting for any given time period. Set-back temperature is defined as the lower setpoint temperature for the energy-savings periods during the heating season, generally nighttime and daytime. Set-up temperature is defined as the higher setpoint temperature for the energy-savings periods during the cooling season, generally nighttime and daytime.*

Annual and Life Cycle Costs and Savings for 13 Programmable Thermostat(s)

	13 ENERGY STAR Unit(s)	13 Conventional Unit(s)	Savings with ENERGY STAR
Annual Energy Costs			
Heating Energy Cost	$9,109	$10,351	$1,242
Heating Energy Consumption (MBTU)	*573*	*651*	*78*
Cooling Energy Cost	$2,168	$2,463	$296
Cooling Energy Consumption (MBTU)	*43.4*	*49.3*	*6*
Total	**$11,277**	**$12,815**	**$1,538**
Life Cycle Costs			
Energy Costs	$125,380	$142,477	$17,097
Heating Energy Costs	*$101,278*	*$115,089*	*$13,811*
Heating Energy Consumption (MBTU)	8,593	9,765	1,172
Cooling Energy Costs	$24,102	$27,388	$3,287
Cooling Energy Consumption (MBTU)	650	739	89
Purchase Price for 13 Unit(s)	*$1,196*	*$949*	*-$247*
Total	**$126,576**	**$143,426**	**$16,850**

Simple payback of initial cost (years) **0.2**