LOCAL GOVERNMENT ENERGY AUDIT PROGRAM: ENERGY AUDIT REPORT

PREPARED FOR: **CAPE MAY COUNTY MUNICIPAL UTILITY AUTHORITY**
SEVEN MILE MIDDLE REGIONAL WASTEWATER FACILITY

39TH STREET PUMP STATION
3859 OCEAN DRIVE
AVALON, NJ 08202

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Table of Contents

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I. EXECUTIVE SUMMARY

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

Cape May County Municipal Utility Authority
- Seven Mile Middle Regional Waste Water Treatment Facility
- 39th Street Pump Station
  3959 Ocean Drive
  Avalon, NJ 08202

Municipal Contact Person: Mr. Charles M. Norkis
Facility Contact Person: Mr. Joshua Palombo

This audit is 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	$ 77,483
Total	$ 77,483

The potential annual energy cost savings for each energy conservation measure (ECM) and renewable energy measure (REM) are shown below in Table 1. Be aware that the ECM's and REM'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
Financial Summary Table

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	General Lighting Replacement	$2,420	$52	46.4	-67.7%
ECM #2	NEMA Premium Pump Motor Replacement	$4,000	$23,642	0.2	10538.9%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	Solar 4.37 KW PV System	$39,300	$2,941	13.4	12.3%
REM #2	2.4 KW Wind Turbine	$32,127	$437	73.5	-72.8%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

The estimated demand and energy savings for each ECM and REM is shown below in Table 2. The descriptions in this table correspond to the ECM's and REM's listed in Table 1.

Table 2
Estimated Energy Savings Summary Table

ENERGY CONSERVATION MEASURES (ECM's)			
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION	
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)
ECM #1	General Lighting Replacement	0.6	255.2
ECM #2	NEMA Premium Pump Motor Replacement	44.5	133,571.0
RENEWABLE ENERGY MEASURES (REM's)			
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION	
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)
REM #1	Solar 4.37 KW PV System	4.4	5,580.0
REM #2	2.4 KW Wind Turbine	2.4	2,460.0

Concord Engineering Group (CEG) recommends proceeding with 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 facility:

- **ECM #2:** NEMA Premium Efficient Pump Motor Replacement

Although ECM #1 does not provide a payback less than 10 years, it is recommended to proceed with the installation of T8 fluorescent fixtures and compact fluorescent light bulbs as suggested in ECM #1 (or equal). This could be done when re-lamping is required. The lighting fixtures are past their expected lifespan and are in fair to poor condition. The new fixtures can provide a better quality of light and provide an energy usage reduction.

In addition to the ECMs, there are maintenance and operational measures that can provide significant energy savings and provide immediate benefit. The ECMs 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. Maintain all weather stripping on entrance doors.
2. Clean all light fixtures to maximize light output.

The generator room outside air intake louver linkage is not connected and is visibly inoperable. Personnel informed me that this is currently opened manually. The outside air is used for combustion air and for generator cooling. Although a maintenance item, it is strongly recommended that the linkage be repaired so the generator can work properly.

Renewable Energy Measures (REMs) were also reviewed for implementation at the 7 Mile 39th Street Pump Station. CEG utilized a roof mounted solar array to house a substantial PV system. The recommended 4.37 kW PV system will produce approximately 5,580 kWh of electricity annually and will reduce the pump station's electrical consumption from the grid by 1.28%. The system's calculated simple payback of 13.4 years is past the standard 10 year simple payback threshold; however, with alternative funding this payback could be lessened. CEG recommends the Owner review all funding options available with this renewable energy measure.

Overall, the CMC MUA – 7 Mile 39th Street Pump Station appears to be operating at a low to average efficiency level compared to other Energy Star buildings in the "Other" category in the region. The above average EUI number can be reconciled by understanding there are three (3) 200 HP pumps that are in the pump station that typically will run one (1) or two (2) pumps at one time. The very large horsepower motors will increase the power demand and power usage when multiple motors are required to operate simultaneously. With the implementation of the above recommended measures the CMC MUA will benefit from further energy savings at the 7 Mile 39th Street Pump Station.

II. INTRODUCTION

The comprehensive energy audit covers the 5,603 square foot Pumping Station, which includes the following spaces: Generator room, toilet room, Motor room, wet well access, wet well and pump room.

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 Index (EUI) is established for the building. Energy Use Index (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 (ECMs). 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 ECMs.

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 ECMs. 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.

ECMs 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 costs 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 Smart Start 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 life-time for each ECM is estimated based on the typical life of the equipment being replaced or altered. The costs and savings are applied and a simple payback, simple lifetime savings, and simple return on investment are calculated. See below for calculation methods:

ECM Calculation Equations:

$$Simple\ Payback = \left(\frac{Net\ Cost}{Yearly\ Savings} \right)$$

$$Simple\ Lifetime\ Savings = \left(Yearly\ Savings \times ECM\ Lifetime \right)$$

$$Simple\ Lifetime\ ROI = \frac{(Simple\ Lifetime\ Savings - Net\ Cost)}{Net\ Cost}$$

$$Lifetime\ Ma\,\mathrm{int}\,enance\ Savings = \left(Yearly\ Ma\,\mathrm{int}\,enance\ Savings \times ECM\ Lifetime \right)$$

$$Internal\ Rate\ of\ \mathrm{Re}\,turn = \sum_{n=0}^{N} \left(\frac{Cash\ Flow\ of\ Period}{(1 + IRR)^n} \right)$$

$$Net\ \mathrm{Pr}\,esent\ Value = \sum_{n=0}^{N} \left(\frac{Cash\ Flow\ of\ Period}{(1 + DR)^n} \right)$$

Net Present Value calculations based on Interest Rate of 3%.

IV. HISTORIC ENERGY CONSUMPTION/COST

A. Energy Usage / Tariffs

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

The electric usage profile represents the actual electrical usage for the facility. Atlantic City Electric provides electricity to the facility under their Annual General Service rate structure. 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.

The overall cost for utilities is calculated by dividing the total cost by the total usage. Based on the utility history provided, the average cost for utilities at this facility is as follows:

Description	Average
Electricity	17.7¢ / kWh

Table 3
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: Atlantic City Electric
Rate: AGS
Meter No: 93485207
Customer ID No: 0564 3099 9997
Third Party Utility
TPS Meter / Acct No:

MONTH OF USE	CONSUMPTION KWH	DEMAND	TOTAL BILL
Dec-08	35,760	271.0	$6,084
Jan-09	33,280	64.0	$5,455
Feb-09	30,000	158.0	$5,218
Mar-09	27,280	63.0	$4,853
Apr-09	27,520	74.0	$4,882
May-09	27,200	130.0	$5,092
Jun-09	40,080	179.0	$7,346
Jul-09	49,680	170.0	$8,812
Aug-09	51,200	177.0	$8,785
Sep-09	50,400	216.0	$8,905
Oct-09	35,440	249.0	$6,117
Nov-09	28,800	317.0	$5,934
Totals	**436,640**	**317.0 Max**	**$77,483**

AVERAGE DEMAND **172.3 KW average**
AVERAGE RATE **$0.177** **$/kWh**

Figure 1
Electricity Usage Profile

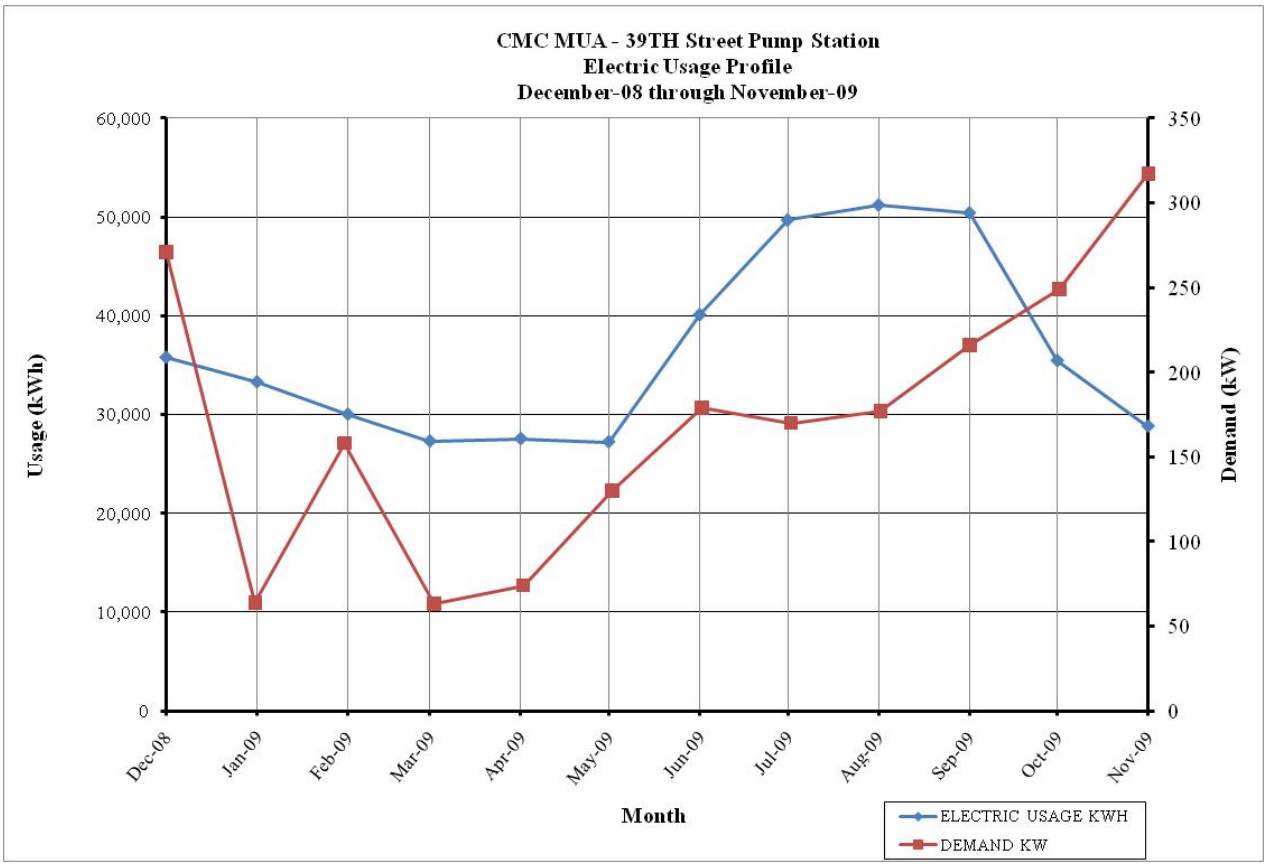


Table 4
Natural Gas Billing Data

There is no gas service.

Figure 2
Natural Gas Usage Profile

There is no gas service.

B. Energy Use Index (EUI)

Energy Use Index (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:

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

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

Table 5
Facility Energy Use Index (EUI) Calculation

ENERGY USE INTENSITY CALCULATION						
ENERGY TYPE	BUILDING USE			SITE ENERGY	SITE-SOURCE RATIO	SOURCE ENERGY
	kWh	Therms	Gallons	kBtu		kBtu
ELECTRIC	436,640.00			1,490,689	3.340	4,978,901
NATURAL GAS		-		0	1.047	0
FUEL OIL			-	0	1.010	0
PROPANE			-	0	1.010	0
TOTAL				1,490,689		4,978,901

*Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.

BUILDING AREA	279	SQUARE FEET
BUILDING SITE EUI	*5,342.97*	kBtu/SF/YR
BUILDING SOURCE EUI	*17,845.52*	kBtu/SF/YR

As a comparison, data has been gathered by the US Department of Energy (DOE) for various facilities cataloguing the standard site and source energy utilization. This data has been published in the 2003 Commercial Building Energy Consumption Survey and is noted as follows for facilities of this type:

- Other (Sewage Pumping Station):
  104 kBtu/SF Site Energy, 213 kBtu/SF Source Energy, 56% electric usage

Based on the information compiled for the studied facility, as compared to the national average the energy usage is approximately 5137% higher than the baseline building site data. Normalizing the baseline site data for 100% electric, baseline site energy is 185.7 kBtu/SF and as compared to the national average the energy usage is approximately 2877% higher than the baseline building site data. This appears to be excessively high but is understandable since the 200 hp pumps run 24/7 with variable frequency drives to match the pump power with the pumping demand. There are three (3) 200 HP pumps that are in the pump station. Typically, one (1) or two (2) 200 HP pumps will at one time. The very large horsepower motors will increase the demand when multiple motors are required to operate simultaneously. These very large horsepower motors use a large amount of electricity and are the reason for the above average EUI number.

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 tracking and assessment of 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 emphasis is being placed 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. It is vital that local government municipalities assess facility energy usage, benchmark energy usage utilizing Portfolio Manager, set priorities and goals to lessen energy usage and move forward with priorities and goals.

In accordance with the Local Government Energy Audit Program, CEG has created an ENERGY STAR account for the municipality to access and monitoring the facility's 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: capemaymua
Password: lgeaceg2009

Security Question: What city were you born in?
Security Answer: "cape may"

The utility bills and other information gathered during the energy audit process are entered into the Portfolio Manager. The following is a summary of the results for the facility:

Table 6
ENERGY STAR Performance Rating

ENERGY STAR PERFORMANCE RATING		
FACILITY DESCRIPTION	**ENERGY PERFORMANCE RATING**	**NATIONAL AVERAGE**
7 Mile 39th Street Pump Station	N/A	N/A

The 7 Mile 39th Street Pump Station falls under the "other" category which is not applicable for Energy Performance Rating. See the **Statement of Energy Performance Appendix** for the detailed energy summary.

V. FACILITY DESCRIPTION

The 5,603 SF Pumping Station is a one story facility comprised of generator room, toilet room, motor room on the ground floor, wet well access and pump room at the basement level. The facility also includes an attic and wet well. The facility operates 24/7 but is only occupied typically 10 hours a week. Exterior walls are block construction with minimum insulation typical of the time period and vinyl siding. The amount of insulation within the wall is unknown. The windows throughout the facility are in good condition and appear to be maintained. Typical windows throughout the facility are double pane, ¼" clear glass with aluminum frames. Blinds are not utilized. Blinds would not be valuable in reducing heat loss in the winter and reducing solar heat in the summer since the attic window is facing north. The majority of the roof is fiberglass shingle. The amount of insulation below the roofing is unknown. The building was built in 1987 with no additions since the original construction.

HVAC Systems

Electric unit heaters with fractional horse power motors are installed in the generator room, motor room and pump room. The heaters, controlled by local thermostat, are used to prevent freezing. The unit heaters are twenty three (23) years old, are in fair condition and are three (3) years past their ASHRAE expected useful service life. These units should be replaced as needed/required as a maintenance project.

There is no cooling at this facility.

Ventilation / Exhaust System

Ventilation is provided by a 15 hp (10.5 bhp) exhaust fan located at the ground floor and serves the basement and basement mezzanine. The air is ducted from the basement to the fan and then out through the sidewall louver. The duct has rusted through and should be replaced. The fan runs on a manual switch. The fan appears to be twenty three (23) years old, in poor condition and is three (3) years past their ASHRAE expected useful service life.

A Penn Ventilator Centrex Inliner exhaust fan model SX335BC is located in the attic and serves the first floor motor room and generator room. It has a 3 hp motor and operates on a hand switch. The fan is three (3) years old, in good to fair condition and has twelve (12) years of ASHRAE expected useful service life remaining.

The toilet room ventilation is provided by a fractional horsepower exhaust fan. The fan operates through the light switch. The fan is twenty three (23) years old, in fair condition and is eight (8) years past the ASHRAE expected useful service life. This fan should be replaced as needed/required as a maintenance project.

The wet well ventilation is provided by a 10 hp (assumed) supply fan and a 15 hp exhaust fan. The fans run as needed and is operated by a wall mounted switch. The supply fan is located in the wet well access and was not accessible for this audit. The exhaust fan is a New York Blower model 500 FRP radial fume exhauster, 15 hp and was built in 2007. The supply and exhaust fans

are three (3) years old, in good condition and have twenty-two (22) years of ASHRAE expected useful service life remaining.

Domestic Hot Water

Domestic hot water for the toilet room is provided by a 15 gallon A.O Smith electric hot water heater, capacity of 6000 Watts. The heater is two (2) years old, in good condition and has twelve (12) years of expected useful service life remaining. The domestic hot water piping insulation appeared to be in good condition.

Lighting

The lighting in the 39th Street Pump Station is primarily made up of fluorescent fixtures with T-12 lamps and magnetic ballasts, as well as metal halide low-bay fixtures. The attic is lit with incandescent lighting. The exterior lighting is high pressure sodium wallpacks. All lighting is manually controlled.

Emergency Generator

The Cummins emergency generator is rated at 600 KW, 750 KVA. The generator has a 4.99 KW block heater that cycles to warm the engine block. The generator is connected to a 2000 gallon above ground, concrete, diesel fuel tank. The generator is not used much. The generator is twenty three (23) years old, in fair condition and is three (3) years past the ASHRAE expected useful service life of reciprocating engines. The generator can be maintained / replaced as needed as a maintenance project. The combustion air damper actuator linkage is broken and, as a result, the dampers are manually opened. The damper actuator linkage needs to be repaired as a maintenance project. The engine block heater should be maintained as the manufacturer does not offer an alternative as to the fuel source for heating the engine block.

Process Equipment

The facility has three (3) 200 hp pumps with variable frequency drives (VFDs). These pumps typically will run one (1) or two (2) pumps at one time. Pump speed is ramped up or down based the demand flow. The pumps are twenty-three (23) years old, are in fair condition and are five (5) years past their ASHRAE expected useful service life.

VI. MAJOR EQUIPMENT LIST

The equipment list is considered major energy consuming equipment and through energy conservation measures could yield substantial energy savings. 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 in some cases if a manufactures 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.

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

VII. ENERGY CONSERVATION MEASURES

ECM #1: Lighting Upgrade - General

Description: General

The lighting in the 39th Street Pump Station is primarily made up of fluorescent fixtures with T-12 lamps and magnetic ballasts, metal halide low-bay. The attic is lit with incandescent lighting. The exterior lighting is high pressure sodium wall packs.

This ECM includes retrofitting of the existing fixtures containing T12 lamps and magnetic ballasts with T8 lamps and electronic ballasts. The new energy efficient, T8 lamps and ballasts will provide adequate lighting and will save the owner on electrical costs due to the better performance of the lamp and ballasts. This ECM will also provide maintenance savings through the reduced 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 is approximately 20,000 burn-hours. The facility will need 33% less lamps replaced per year.

This ECM also includes replacement of all incandescent lamps to compact fluorescent lamps. The energy usage of an incandescent compared to a compact fluorescent approximately 3 to 4 times greater. In addition to the energy savings, compact fluorescent fixtures burn-hours are 8 to 15 times longer than incandescent fixtures ranging from 6,000 to 15,000 burn-hours compared to incandescent fixtures ranging from 750 to 1000 burn-hours.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix – ECM#1** 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 retrofit of a T-12 fixture to a T-5 or T-8 fixture warrants the following incentive: T-5 or T-8 w/electronic ballast (1-4 lamp) = $15 per fixture.

$$\text{Smart Start®}\ Incentive = (\#\ of\ 1-4\ lamp\ \ fixtures\ retrofitted \times\ \$15)$$
$$\text{Smart Start®}\ Incentive = (28 \times\ \$15) = \underline{\$420}$$

Replacement and Maintenance Savings are calculated as follows:

$$Savings = (reduction\ in\ lamps\ replaced\ \ per\ \ year) \times (repacment\ \$\ per\ lamp + Labor\ \$\ per\ lamp)$$

$$Savings = (1\ lamps\ \ per\ \ year) \times (\$2.00 + \$5.00) = \$7$$

From the Smart Start Incentive appendix, there is no incentive for replacing incandescent lamps with compact fluorescent lamps. The incentive is only available if the entire light fixture is replaced. In most cases, the existing fixtures can be re-lamped by the facility's staff to obtain the energy savings without the expense of a new fixture and the involvement of an electrician to install a new fixture.

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,840
NJ Smart Start Equipment Incentive ($):	$420
Net Installation Cost ($):	$2,420
Maintenance Savings ($/Yr):	$7
Energy Savings ($/Yr):	$45
Total Yearly Savings ($/Yr):	$52
Estimated ECM Lifetime (Yr):	15
Simple Payback	46.4
Simple Lifetime ROI	-67.7%
Simple Lifetime Maintenance Savings	$105
Simple Lifetime Savings	$782
Internal Rate of Return (IRR)	-12%
Net Present Value (NPV)	($1,797.32)

ECM #2: Install NEMA Premium Efficient Pump Motor

Description:

Replacing an old pump motors with new efficient motor is a simple change that can provide substantial savings.

Existing electric motors equal to or greater than one horsepower ranged from 78 to 93% efficient. The improved efficiency of the NEMA premium efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate 40-80 hours per week, even small increases in efficiency can yield substantial energy and dollar savings.

This energy conservation measure would replace all motors equal to or greater than 1 HP with NEMA Premium® Efficient Motors. NEMA Premium® is the most efficient motor designation in the marketplace today. Using MotorMaster+, Version 4, the energy & cost savings were calculated for the fan/pump motors in this facility that are greater than or equal to 1 HP.

Energy Savings Calculations:

Existing: A 200 HP pump Motor with the following characteristics:
Existing Motor Efficiency = 85%
Annual Hours of Operations = 3000
1 HP = 0.746 KW
Load Factor = 75%
Cost of electricity = $0.177 / kWh

Existing 200HP Motor Operating Cost =
{0.746 KW/HP x Motor HP x Load Factor x Hours of Operation x Cost of Electricity] ÷ Motor Efficiency
= [0.746 x 200 x 0.75 x 3000 x 0.177] ÷ 0.85 = $69,905 / Year

New NEMA Premium Motor Efficiency = 95.8%

New NEMA Premium Efficiency Motor Operating Cost =
{0.746 x 200 x 0.75 x 3000 x 0.177} ÷ 0.958 = $62,024 / Year

Savings = $69,905 - $62,024 = $7,881 / Year

Installed Cost of a 200 HP NEMA Premium® Efficiency Motor = $26,850

Installed Cost of a 200 HP same (standard) efficiency motor = $22,150

The SmartStart Building® incentive of 200hp is $700/TEFC Premium Efficient motor.

The cost premium of a premium efficient motor is $26,850 - $22,150 = $4,700

Less the SmartStart Building® incentive $4,700 - $700 = $4,000

Simple Payback for efficiency Premium = $4000 / $7,881 = 0.5 Years

kWh saved = $7,881 / $0.177/kWh = 44,524 kWh (per motor)

kW saved = 44,524 kWh / 3,000 hrs./yr. = 14.84 kW (per motor)

The following table outlines the motor replacements efficiencies and savings for this facility:

NEMA PREMIUM EFFICIENT MOTOR REPLACEMENT						
Equipment Tag	**Motor HP**	**Existing Efficiency**	**NEMA Premium Efficiency**	**kW Savings**	**kWh Savings**	**Cost Savings**
Drywell Pumps	200	85.0%	95.8%	14.84	44,524	$7,881
Drywell Pumps	200	85.0%	95.8%	14.84	44,524	$7,881
Drywell Pumps	200	85.0%	95.8%	14.84	44,524	$7,881
Total Savings				**44.5**	**133,571**	**$23,642**

The motors that are past there useful life and should be replaced are listed in the table above. Considering replacement cost alone would not provide an economical benefit. When considering efficiency upgrades, a comparison of cost difference between the standard efficiency and the premium efficiency motor should be evaluated. The following table outlines the recommended motor replacement plan for this facility based on the cost premium of the efficiency upgrade:

MOTOR REPLACEMENT PLAN							
Motor HP	**QTY**	**ENCL. TYPE**	**No. of POLEs**	**INSTALLED Cost ****	**TOTAL COST**	**TOTAL SAVINGS**	**Simple Payback**
200	1	XPFC	4-Pole	$4,000	$4,000	$7,880.68	0.5
200	1	XPFC	4-Pole	$4,000	$4,000	$7,880.68	0.5
200	1	XPFC	4-Pole	$4,000	$4,000	$7,880.68	0.5
				Totals:	*$12,000*	*$23,642*	*0.5*

**** Additional cost of a Premium Efficient motor (compaired to existing efficiency) less the applicable rebate**

This ECM utilizes differential cost in order to show the owner the advantage of replacing an aged, standard efficient motor with a new, premium efficient motor. The owner should review this option prior to rebuilding or replacing all malfunctioning motors.

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$6,100
NJ Smart Start Equipment Incentive ($):	$2,100
Net Installation Cost ($):	$4,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$23,642
Total Yearly Savings ($/Yr):	$23,642
Estimated ECM Lifetime (Yr):	18
Simple Payback	0.2
Simple Lifetime ROI	10538.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$425,556
Internal Rate of Return (IRR)	591%
Net Present Value (NPV)	$321,160.56

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 measures (REM) for the municipality utilizing renewable technologies and concluded that there is potential for solar energy generation. The solar photovoltaic system calculation summary will be concluded as **REM#1** within this report.

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). 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 300 S.F. can be utilized for a PV system. A depiction of the area utilized is shown in **Renewable / Distributed Energy Measures Calculation Appendix**. Using this square footage it was determined that a system size of 4.37 kilowatts could be installed. A system of this size has an estimated kilowatt hour production of 5,580 KWh annually, reducing the overall utility bill by approximately 1.28% percent. A detailed financial analysis can be found in the **Renewable / Distributed Energy Measures Calculation Appendix**. 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.

Direct purchase involves the CMC MUA pump station paying for 100% of the total project cost upfront via one of the methods noted in the Installation Funding Options section below. Calculations include a utility inflation rate as well as the degradation of the solar panels over time. Based on our calculations the following is the payback period:

Table 7
Financial Summary – Photovoltaic System

FINANCIAL SUMMARY - PHOTOVOLTAIC SYSTEM			
PAYMENT TYPE	**SIMPLE PAYBACK**	**SIMPLE ROI**	**INTERNAL RATE OF RETURN**
Direct Purchase	13.37 Years	7.5%	6.2%

*The solar energy measure is shown for reference in the executive summary Renewable Energy Measure (REM) table

Given the large amount of capital required by the CMC MUA pump station to invest in a solar system through a Direct Purchase CEG does not recommend the CMC MUA pump station pursue this route. It would be more advantageous for the CMC MUA pump station to solicit Power Purchase Agreement (PPA) Providers who will own, operate, and maintain the system for

a period of 15 years. During this time the PPA Provider would sell all of the electric generated by Solar Arrays to the CMC MUA pump station at a reduced rate compared to their existing electric rate.

Wind Generation

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; with an average annual wind speed of 6.15 meters per second at 30 meter height, it is sufficient enough to reach the cut in speed for most commercial sized wind turbines of 3.5 meters per second. The installation of 2.4 kilowatt Skystream Wind Turbine with a 15 meter hub height at the facility would be able to produce approximately 2,460 kWh for just one turbine. Even though the electric load could accommodate a much larger wind turbine the site constraints make the installation of such a turbine not feasible. The turbine installation itself has an expected payback of over 30 years, being priced at approximately $33,000 installed. Based on our calculations the following is the payback period:

Table 8
Financial Summary – Wind Turbine System

REM #2 - WINDTURBINES	
Installation Cost ($):	$40,000
NJ Smart Start Equipment Incentive ($):	$7,873
Net Installation Cost ($):	$32,127
Maintenance Savings ($):	($60)
REC Revenue ($/Yr):	$62
Energy Savings ($/Yr):	$435
Total Yearly Savings ($/Yr):	$437
Estimated ECM Lifetime (Yr):	20
Simple Payback	73.53
Lifetime Energy Savings	$8,709

For further wind analysis refer to the **Wind Analysis Calculation Appendix.**

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 Profile included within this report to reference the electricity usage load profile.

Electricity:

The Electric Usage Profile shows increased usage in the summer months between June and October. This profile is justified by the vacation season and high tourist volume in those months. The winter and early spring season represent lower consumption. The majority of the building's electric usage is due to the large pumps housed in the building. This is the primary function of the facility. The electric load is completely dependent on the water treatment load for the areas connected to the facility. The electric demand is at its peak in the months of July through September representing the largest electric draw at the height of the beach vacation season. The facility pumps run based on water treatment needs and as a result the full load operation is extremely short. This results in a very low load factor rating of approximately 15%. Load factor is the total usage divided by the demand times the total hours (KWH/KW*8760). This means that the full load electric draw for the facility is only used for 15% of the time. A higher load factor (rating of 50% or higher) along with a flat load profile will allow for more competitive energy prices when shopping for alternative suppliers.

Tariff Analysis:

Electricity:

This facility receives electrical service through Atlantic City Electric on their Annual General Service (AGS-Secondary) rate. This service classification is available for general service purposes on secondary voltages. This facility's rate is a three phase service at secondary voltages. For electric supply (generation), the customer has the option to purchase energy through the utility's Generation Charge or a Third Party Supplier (TPS). This facility utilizes the generation service provide through Atlantic City Electric (BGS), Therefore, they will pay according to the default service. The Delivery Service includes the following charges: Customer Charge, Distribution Charge (kW Demand), Reactive Demand Charge (kvar Demand, over 1/3 kW), Distribution Charge kWh, Non-utility Generation Charge, Societal benefits Charge kWh, Regulatory Assets Recovery Charge kWh, Transition Bond Charge kWh, Market Transition Charge Tax kWh, System Control Charge kWh, CIEP Standby Fee kWh, Transmission Demand Charge kW, Reliability Must Run Transmission Surcharge kWh, Transmission Enhancement Charge kWh, Basic Generation Service Charge kWh, Regional Greenhouse Gas Initiative Recovery Charge kWh, Infrastructure Investment Surcharge.

The Demand charges are based on a ratchet demand rate of 80% of the highest demand set in the months of June through September. The usage charges are based on a stepped rate structure. The demand charges for this rate structure are far less than the usage charges on a typical basis making this rate structure less dependent on demand versus usage. However because of the extremely low load factor and high demand relative to the overall usage, the demand charges play a more significant role in the overall electric costs. The resulting cost for electricity is increased due to high fluctuations in electric draw (high demand).

Recommendations:

CEG recommends a global approach that will be consistent with all facilities within the County. Based on the latest electric utility bill, the average price per kWh (kilowatt hour) for the building is $0.1226/kWh based on the utility information provided (this is the average "price to compare" if the client intends to shop for energy). Note this is the supply charges price to compare and therefore does not take into account the excessive demand (delivery) charges for the facility. The primary method for reducing electric delivery charges is by flattening the facility's load provide and increase load factor. Regarding supply energy, these commodities are among the most volatile of all commodities, however at this point and time, energy is relatively competitive. The County should consider procuring energy through alternative supply sources to shop for the most competitive prices.

CEG also recommends that the County schedule a meeting with the current utility providers to review their utility charges and current tariff structures for electricity. This meeting would provide insight regarding alternative procurement options that are currently available. Through its meeting with the Local Distribution Company (LDC), the County can learn more about the competitive supply process. Cape May County can acquire a list of approved Third Party Suppliers from the New Jersey Board of Public Utilities website at www.nj.gov/bpu. The County should 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. The County should ask the utility representative about alternative billing options, such as consolidated billing when utilizing the service of a Third Party Supplier. This could be performed with the aid of an "energy advisor".

X. INSTALLATION FUNDING OPTIONS

CEG has reviewed various funding options for the facility 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 par 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.

iv. *Pay For Performance – The New Jersey Smart Start Pay for Performance program includes incentives based on savings resulted from implemented ECMs. The program is available for all buildings with average demand loads above 200 KW. The facility's participation in the program is assisted by an approved program partner. An "Energy Reduction Plan" is created with the facility and approved partner to shown at least 15% reduction in the building's current energy use. Multiple energy conservation measures implemented together are applicable toward the total savings of at least 15%. No more than 50% of the total energy savings can result from lighting upgrades / changes.*

Total incentive is capped at 50% of the project cost. The program savings is broken down into three benchmarks; Energy Reduction Plan, Project

Implementation, and Measurement and Verification. Each step provides additional incentives as the energy reduction project continues. The benchmark incentives are as follows:

1. *Energy Reduction Plan – Upon completion of an energy reduction plan by an approved program partner, the incentive will grant $0.10 per square foot between $5,000 and $50,000, and not to exceed 50% of the facility's annual energy expense. (Benchmark #1 is not provided in addition to the local government energy audit program incentive.)*

2. *Project Implementation – Upon installation of the recommended measures along with the "Substantial Completion Construction Report," the incentive will grant savings per KWH or Therm based on the program's rates. Minimum saving must be 15%. (Example $0.11 / kWh for 15% savings, $0.12/ kWh for 17% savings, … and $1.10 / Therm for 15% savings, $1.20 / Therm for 17% saving, …) Increased incentives result from projected savings above 15%.*

3. *Measurement and Verification – Upon verification 12 months after implementation of all recommended measures, that actual savings have been achieved, based on a completed verification report, the incentive will grant additional savings per kWh or Therm based on the program's rates. Minimum savings must be 15%. (Example $0.07 / kWh for 15% savings, $0.08/ kWh for 17% savings, … and $0.70 / Therm for 15% savings, $0.80 / Therm for 17% saving, …) Increased incentives result from verified savings above 15%.*

v. *Direct Install Program* – The New Jersey Clean Energy's Direct Install Program is a state funded program that targets small commercial and industrial facilities with peak demand of less than 200 kW. This turnkey program is aimed at providing owners a seamless, comprehensive process for analysis, equipment replacement and financial incentives to reduce consumption, lower utility costs and improve profitability. The program covers up to 80% of the cost for eligible upgrades including lighting, lighting controls, refrigeration, HVAC, motors, variable speed drives, natural gas and food service. Participating contractors (refer to www.njcleanenergy.com) conduct energy assessments in addition to your standard local government energy audit and install the cost-effective measures.

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. Maintain all weather stripping on windows and doors.

B. Clean all light fixtures to maximize light output.

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

39TH Street Pumping Station

ECM ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	General Lighting Replacement	$2,840	$0	$420	$2,420	$45	$7	$52	15	$782	$105	-67.7%	46.4	-11.64%	($1,797.32)
ECM #2	NEMA Premium Pump Motor Replacement	$6,100	$0	$2,100	$4,000	$23,642	$0	$23,642	18	$425,556	$0	10538.9%	0.2	591.05%	$321,160.56
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	Solar 4.37 KW PV System	$39,300	$0	$0	$39,300	$988	$1,953	$2,941	15	$44,115	$29,295	12.3%	13.4	1.48%	($4,190.53)
REM #2	2.4 KW Wind Turbine	$40,000	$0	$7,873	$32,127	$435	$2	$437	20	$8,740	$40	-72.8%	73.5	-10.11%	($25,625.54)

Notes: 1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

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 February, 2010:

Electric Chillers

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

Energy Efficiency must comply with ASHRAE 90.1-2004

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
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat

Energy Efficiency must comply with ASHRAE 90.1-2004

Ground Source Heat Pumps

Closed Loop & Open Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2004

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, AFUE ≥ 92%

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
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

Retro fit of T12 to T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities	$15 per fixture (1-4 lamps)
Replacement of T12 with new T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities	$25 per fixture (1-2 lamps) $30 per fixture (3-4 lamps)
T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
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
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture
HID ≥ 100w Replacement with new HID ≥ 100w	$70 per fixture
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$42 per 5 foot $65 per 6 foot

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
Daylight Dimming - office	$50 per fixture controlled

Premium Motors

Three-Phase Motors	$45 - $700 per motor
Fractional HP Motors Electronic Communicated Motors (replacing shaded pole motors in refrigerator/freezer cases)	$40 per electronic communicated motor

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
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and a IRR of at least 10%.
Multi Measures Bonus	15%

STATEMENT OF ENERGY PERFORMANCE
7 MILE 39TH STREET PS

Building ID: 2260787
For 12-month Period Ending: November 30, 2009[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: March 30, 2010

Facility
7 MILE 39TH STREET PS
3959 Ocean Drive
Avalon, NJ 08202

Facility Owner
Cape May MUA
1523 Route 9 North
Swainton, NJ 08210

Primary Contact for this Facility
Josh Palombo
1523 Route 9 North
Swainton, NJ 08210

Year Built: 1987
Gross Floor Area (ft²): 5,603

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

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	1,489,816
Natural Gas - (kBtu)[4]	0
Total Energy (kBtu)	1,489,816

Energy Intensity[5]

Site (kBtu/ft²/yr)	266
Source (kBtu/ft²/yr)	888

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	227

Electric Distribution Utility
Pepco - Atlantic City Electric Co

National Average Comparison

National Average Site EUI	104
National Average Source EUI	213
% Difference from National Average Source EUI	317%
Building Type	Other

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.

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**

Certifying Professional
Michael Fischette
520 South Burnt Mill Road
Voorhees, NJ 08043

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	7 MILE 39TH STREET PS	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	Other	Is this an accurate description of the space in question?		☐
Location	3959 Ocean Drive, Avalon, NJ 08202	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		☐
7 MILE 39TH STREET PS (Other)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	5,603 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	10Hours(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	19(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: Pepco - 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))**
11/01/2009	11/30/2009	28,800.00
10/01/2009	10/31/2009	35,440.00
09/01/2009	09/30/2009	50,400.00
08/01/2009	08/31/2009	51,200.00
07/01/2009	07/31/2009	49,680.00
06/01/2009	06/30/2009	40,080.00
05/01/2009	05/31/2009	27,200.00
04/01/2009	04/30/2009	27,520.00
03/01/2009	03/31/2009	27,280.00
02/01/2009	02/28/2009	30,000.00
01/01/2009	01/31/2009	33,280.00
12/01/2008	12/31/2008	35,760.00
Electric Consumption (kWh (thousand Watt-hours))		**436,640.00**
Electric Consumption (kBtu (thousand Btu))		**1,489,815.68**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**1,489,815.68**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity 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
7 MILE 39TH STREET PS
3959 Ocean Drive
Avalon, NJ 08202

Facility Owner
Cape May MUA
1523 Route 9 North
Swainton, NJ 08210

Primary Contact for this Facility
Josh Palombo
1523 Route 9 North
Swainton, NJ 08210

General Information

7 MILE 39TH STREET PS	
Gross Floor Area Excluding Parking: (ft^2)	5,603
Year Built	1987
For 12-month Evaluation Period Ending Date:	November 30, 2009

Facility Space Use Summary

7 MILE 39TH STREET PS	
Space Type	Other - Other
Gross Floor Area(ft^2)	5,603
Number of PCs[o]	2
Weekly operating hours[o]	10
Workers on Main Shift[o]	19

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 11/30/2009)	**Baseline** (Ending Date 11/30/2009)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	N/A	N/A	75	N/A	N/A
Energy Intensity					
Site (kBtu/ft^2)	266	266	0	N/A	104
Source (kBtu/ft^2)	888	888	0	N/A	213
Energy Cost					
$/year	$ 77,483.00	$ 77,483.00	N/A	N/A	$ 30,305.50
$/$ft^2$/year	$ 13.83	$ 13.83	N/A	N/A	$ 5.41
Greenhouse Gas Emissions					
$MtCO_2e$/year	227	227	0	N/A	89
$kgCO_2e/ft^2$/year	40	40	0	N/A	16

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

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

MAJOR EQUIPMENT LIST

Concord Engineering Group

"7 MILE 39TH STREET PS"

Motors

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	HP	RPM	Frame	Volts / Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	Motor Room	Dry well Pumps	US Elecric Motors	1	HV	N05L2120473G-01	200	1185	5006 PH	480/3	219	1987	18	(-5)	120v, 288w heater
-	Motor Room	Dry well Pumps	US Elecric Motors	1	HV	N05L2120473G-02	200	1185	5006 PH	480/3	219	1987	18	(-5)	120v, 288w heater
-	Motor Room	Dry well Pumps	US Elecric Motors	1	HV	N05L2120473G-03	200	1185	5006 PH	480/3	219	1987	18	(-5)	120v, 288w heater
-	Dry Well	Dry well Pumps	General Electric	1	Could not Read	Could not Read	Could not Read	Could not Read	Could not Read	480/3	Could not Read	1987	18	(-5)	

Pumps

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	GPM	RPM	Ft Hd	Volts / Phase	Amps	Approx. Age	Service Life	Remaining Life	Notes
-	dry well	dry well	Goulds Pumps Inc	1	NCD 10x10-20	-	5563	1160	103	480/3	219	1987	10	(-13)	178 bhp, Out of service.
-	dry well	dry well	Goulds Pumps Inc	1	NCD 10x10-20	M29708	5563	1160	103	480/3	219	1987	10	(-13)	178 bhp
-	dry well	dry well	Morris Pumps	1	NC 10 10-21 2V 2DBS	9A 10563	5563	1160	103	480/3	219	Jul-06	10	6	

Fans

Tag	Location	Area Served	Manufacturer	Qty.	Model #	Serial #	CFM	Fan RPM	Volts/Phase	Amps	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	Grade	Wet Well	New York Blower	1	B08160 100	70985	3600	2195	-	-	2007	15	12	Size 500 FRP, 10.5 bhp
-	Attic	First floor	Pen Vent	1	SX335BC	-	-	-	-	-	2007	15	12	

Domestic Water Heater

Tag	Location	Area Served	Manufacturer	Qty	Model #	Serial #	Input (MBh)	Recovery (gal/h)	Capacity (gal)	Efficiency (%)	Fuel	Approx. Age	ASHRAE Service Life	Remaining Life	Notes
-	Restroom	Restroom	AO Smith	1	DEL15S	-	6 KW	-	15	-	electric	2	12	10	

NOTE: IF AN ITEM IS LEFT BLANK, THE INFORMATION IS EITHER NOT AVAILABLE OR NOT APPLICABLE FOR THIS PIECE OF EQUIPMENT

Investment Grade Lighting Audit

CEG Job #: 9C09168
Project: CMC MUA – 7 Mile 39th Street Pump Station
Address: 3959 Ocean Drive
Avalon, NJ 08202
Building SF: 5,603

"CMC MUA – 7 Mile 39th Street Pump Station"

KWH COST: $0.177

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING								SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
121.16	Upper Level (Grnd Floor)	900	11	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mnt., Clear Acrylic Lens	68	0.75	673.2	$119.16	11	2	2 Lamp, 32w T8, Elect. Ballast; retrofit	58	0.64	574.2	$101.63	$100.00	$1,100.00	0.11	99	$17.52	62.77
121.16	Middle Floor	900	5	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mnt., Clear Acrylic Lens	68	0.34	306.0	$54.16	5	2	2 Lamp, 32w T8, Elect. Ballast; retrofit	58	0.29	261	$46.20	$100.00	$500.00	0.05	45	$7.97	62.77
121.16	Bottom Floor	900	6	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mnt., Clear Acrylic Lens	68	0.41	367.2	$64.99	6	2	2 Lamp, 32w T8, Elect. Ballast; retrofit	58	0.35	313.2	$55.44	$100.00	$600.00	0.06	54	$9.56	62.77
760		900	3	1	400w MH Lo-Bay	465	1.40	1,255.5	$222.22	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
121.16	Generator Room	900	6	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Pendant Mnt., Clear Acrylic Lens	68	0.41	367.2	$64.99	6	2	2 Lamp, 32w T8, Elect. Ballast; retrofit	58	0.35	313.2	$55.44	$100.00	$600.00	0.06	54	$9.56	62.77
630	Attic	10	2	1	"Keyless" Socket, (1) 200w Type A	200	0.40	4.0	$0.71	2	1	42w CFL	42	0.08	0.84	$0.15	$20.00	$40.00	0.32	3.16	$0.56	71.52
731	Exterior	3600	2	1	150w HPS Wallpack	188	0.38	1,353.6	$239.59	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
	Totals		35				4.08	4,326.7	$765.83	35	9			1.708	1462.44	$258.85		$2,840.00	0.60	255.2	$45.16	62.88

NOTES: 1. Simple Payback noted in this spreadsheet does not include Maintenance Savings and NJ Smart Start Incentives.
2. Lamp totals only include T-12 tube replacment calculations

Project Name: LGEA Solar PV Project - 7 Mile 39th Street
Location: Avalon, NJ
Description: Photovoltaic System - Direct Purchase

Simple Payback Analysis

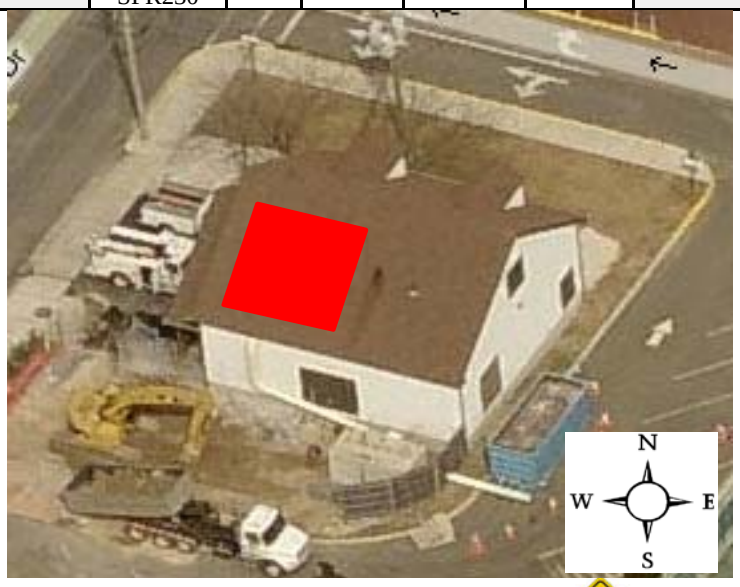
	Photovoltaic System - Direct Purchase
Total Construction Cost	$39,330
Annual kWh Production	5,580
Annual Energy Cost Reduction	$988
Annual SREC Revenue	$1,953
First Cost Premium	**$39,330**
Simple Payback:	**13.37** **Years**

Life Cycle Cost Analysis

Analysis Period (years):	25	Financing %:	0%
Financing Term (mths):	0	Maintenance Escalation Rate:	3.0%
Average Energy Cost ($/kWh)	**$0.177**	Energy Cost Escalation Rate:	3.0%
Financing Rate:	0.00%	SREC Value ($/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	$39,330	0	0	0	$0	(39,330)	0
1	$0	5,580	$988	$0	$1,953	$2,941	($36,389)
2	$0	5,552	$1,017	$0	$1,943	$2,961	($33,429)
3	$0	5,524	$1,048	$0	$1,934	$2,981	($30,447)
4	$0	5,497	$1,079	$0	$1,924	$3,003	($27,444)
5	$0	5,469	$1,112	$56	$1,914	$2,970	($24,475)
6	$0	5,442	$1,145	$56	$1,905	$2,994	($21,481)
7	$0	5,415	$1,179	$56	$1,895	$3,019	($18,463)
8	$0	5,388	$1,215	$55	$1,886	$3,045	($15,418)
9	$0	5,361	$1,251	$55	$1,876	$3,072	($12,346)
10	$0	5,334	$1,289	$55	$1,867	$3,101	($9,245)
11	$0	5,307	$1,327	$55	$1,858	$3,130	($6,115)
12	$0	5,281	$1,367	$54	$1,848	$3,161	($2,954)
13	$0	5,254	$1,408	$54	$1,839	$3,193	$239
14	$0	5,228	$1,450	$54	$1,830	$3,226	$3,466
15	$0	5,202	$1,494	$54	$1,821	$3,261	$6,727
16	$0	5,176	$1,539	$53	$1,812	$3,297	$10,024
17	$0	5,150	$1,585	$53	$1,802	$3,334	$13,358
18	$0	5,124	$1,632	$53	$1,793	$3,373	$16,731
19	$0	5,099	$1,681	$53	$1,785	$3,413	$20,144
20	$0	5,073	$1,732	$52	$1,776	$3,455	$23,600
21	$1	5,048	$1,784	$52	$1,767	$3,499	$27,098
22	$2	5,022	$1,837	$52	$1,758	$3,543	$30,642
23	$3	4,997	$1,892	$51	$1,749	$3,590	$34,232
24	$4	4,972	$1,949	$51	$1,740	$3,638	$37,870
25	$5	4,948	$2,008	$51	$1,732	$3,688	$41,558
	Totals:	131,442	$36,009	$1,126	$46,005	$80,888	$27,482
				Net Present Value (NPV)		**$41,583**	
				Internal Rate of Return (IRR)		**6.2%**	

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
7 Mile 39th Street	300	Sunpower SPR230	19	14.7	279	4.37	5,580	627	15.64



PVWatts

AC Energy & Cost Savings

Cautions for Interpreting the Results

Station Identification	
City:	Atlantic_City
State:	New_Jersey
Latitude:	39.45° N
Longitude:	74.57° W
Elevation:	20 m
PV System Specifications	
DC Rating:	4.4 kW
DC to AC Derate Factor:	0.810
AC Rating:	3.5 kW
Array Type:	Fixed Tilt
Array Tilt:	18.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	0.2 ¢/kWh

Results			
Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	2.92	328	0.58
2	3.64	370	0.65
3	4.53	492	0.87
4	5.31	544	0.96
5	5.85	608	1.08
6	6.07	586	1.04
7	6.03	596	1.05
8	5.61	557	0.99
9	5.06	493	0.87
10	4.08	421	0.75
11	2.97	309	0.55
12	2.55	277	0.49
Year	4.56	5580	9.88

.= Proposed PV Layout

Notes:

1. Estimated kWH based on the National Renewable Energy Laboratory PVWatts Version 1 Calculator Program.

REM #2 - WINDTURBINES	
Installation Cost ($):	$40,000
NJ Smart Start Equipment Incentive ($):	$7,873
Net Installation Cost ($):	$32,127
Maintenance Savings ($):	($60)
REC Revenue ($/Yr):	$62
Energy Savings ($/Yr):	$435
Total Yearly Savings ($/Yr):	$437
Estimated ECM Lifetime (Yr):	20
Simple Payback	73.53
Lifetime Energy Savings	$8,709

SkyStream - 2.4 kW - 30 ft Hub Height - Electric Load Can Handle larger turbine but due to site constraints this turbine is more likely to fit

AVERAGE WIND SPEED IS TOO LOW