PITTSGROVE TOWNSHIP SCHOOL DISTRICT

ELMER ELEMENTARY SCHOOL

207 Front Street, Elmer NJ 08318

LOCAL GOVERNMENT ENERGY AUDIT PROGRAM
FOR
NEW JERSEY
BOARD OF PUBLIC UTILITIES

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Prepared by:

6 Campus Drive
Parsippany, NJ 07054
(973) 538-2120

CHA PROJECT NO. 28484

TABLE OF CONTENTS

APPENDICES

REPORT DISCLAIMER

This audit was conducted in accordance with the standards developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) for a Level II audit. Cost and savings calculations for a given measure were estimated to within ±20%, and are based on data obtained from the owner, data obtained during site observations, professional experience, historical data, and standard engineering practice. Cost data does not include soft costs such as engineering fees, legal fees, project management fees, financing, etc.

A thorough walkthrough of the building was performed, which included gathering nameplate information and operating parameters for all accessible equipment and lighting systems. Unless otherwise stated, model, efficiency, and capacity information included in this report were collected directly from equipment nameplates and /or from documentation provided by the owner during the site visit. Typical operation and scheduling information was obtained from interviewing staff and spot measurements taken in the field.

List of Common Energy Audit Abbreviations

- A/C – Air Conditioning
- AHS – Air Handling Unit
- BMS – Building Management System
- Btu – British thermal unit
- CDW – Condenser Water
- CFM – Cubic feet per minute
- CHW – Chilled Water
- DCV – Demand Control Ventilation
- DDC – Direct Digital Control
- DHW – Domestic Hot Water
- DX – Direct Expansion
- EER – Energy Efficiency Ratio
- EF – Exhaust Fan
- EUI – Energy Use Intensity
- Gal – Gallon
- GPD – Gallons per day
- GPF – Gallons Per Flush
- GPH – Gallons per hour
- GPM – Gallons per minute
- GPS – Gallons per second
- HHW – Heating Hot Water
- HID – High Intensity Discharge
- HP – Horsepower
- HRU – Heat Recovery Unit
- HVAC – Heating, Ventilation, Air Conditioning
- HX – Heat Exchanger
- kbtu/mbtu – One thousand (1,000) Btu
- kW – Kilowatt (1,000 watts)
- kWh – Kilowatt-hours
- LED – Light Emitting Diode
- mbh – Thousand Btu per hour
- mmbtu – One million (1,000,000) Btu
- OCC – Occupancy Sensor
- PSI – Pounds per square inch
- RTU – Rooftop Unit
- SBC – System Benefits Charge
- SF – Square foot
- UH – Unit Heater
- V – Volts
- VAV – Variable Air Volume
- VSD – Variable Speed Drive
- W – Watt

1.0 EXECUTIVE SUMMARY

This report summarizes the energy audit performed by CHA for Pittsgrove Township School District, in connection with the New Jersey Board of Public Utilities (NJBPU) Local Government Energy Audit (LGEA) Program. The purpose of this report is to identify energy savings opportunities associated with major energy consumers and inefficient practices. Low-cost and no-cost are also identified during the study. This report details the results of the energy audit conducted for the building listed below:

Building Name	Address	Square Feet	Construction Date
Elmer Elementary School	207 Front Street, Elmer, NJ 08318	21,240	1956

The potential total annual energy and cost savings for the energy conservation measures (ECM) recommended identified in the survey are shown below:

Building Name	Electric Savings (kWh)	NG Savings (therms)	Total Savings ($)	Payback (years)
Elmer Elementary School	38,733	3,664	10,562	18.6

Each individual measure's annual savings are dependent on that measure alone, there are no interactive effects calculated. There are three options shown for Lighting ECM savings; only one option can be chosen. Incentives shown (if any) are based only on the SmartStart Incentive Program. Other NJBPU or local utility incentives may also be available/ applicable and are discussed in Section 6.0.

Each measure recommended by CHA typically has a stand-alone simple payback period of 15 years or less. However, if the owner choses to pursue an Energy Savings Improvement Plan (ESIP), high payback measures could be bundled with lower payback measures which ultimately can result in a payback which is favorable for an ESIP project to proceed. Occasionally, we will recommend an ECM that has a longer payback period, based on the need to replace that piece(s) of equipment due to its age, such as a boiler for example.

The following table provides a detailed summary of each ECM for the building surveyed, including costs, savings, SmartStart incentives and payback.

Summary of Energy Conservation Measures

ECM #	Energy Conservation Measure	Est. Costs ($)	Est. Savings ($/year)	Payback w/o Incentive	Potential Incentive ($)*	Payback w/ Incentive	Recommended
ECM-1	Add Insulation on Fiberglass Wall Panels	23,000	1,715	13.4	0	13.4	Y
ECM-2	Replace Boilers with Condensing Boilers	115,543	2,821	41.0	5,250	39.1	Y
ECM-3	Install Programmable Thermostats on Split Units	4,125	313	13.2	0	13.2	Y
ECM-4	Replace Electric DHW Heaters with Gas Fired Condensing DHW Heaters	34,365	1,028	33.4	100	33.3	N
ECM-L1**	Lighting Replacements / Upgrades	48,440	5,241	9.2	2,750	8.7	N
ECM-L2**	Install Lighting Controls (Add Occupancy Sensors)	5,643	990	5.7	745	4.9	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	54,083	5,713	9.5	3,495	8.9	Y
	Total**	231,116	11,590	19.9	8,845	19.2	
	Total (Recommended)	196,751	10,562	18.6	8,745	17.8	

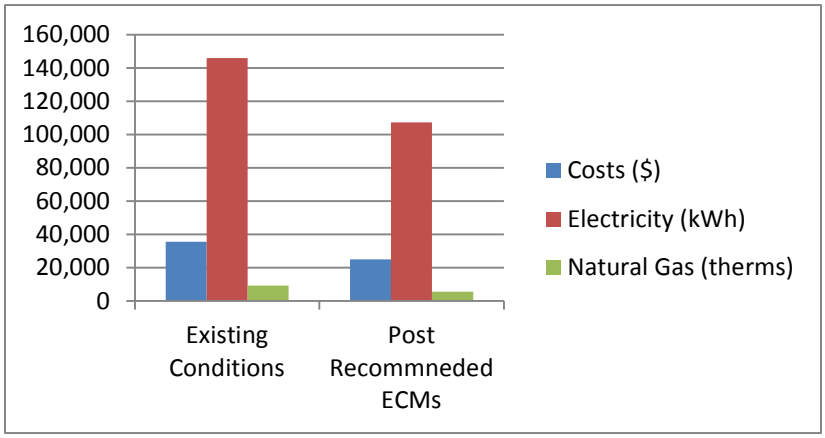
* Incentive shown is per the New Jersey SmartStart Program.
** These ECMs are not included in the Total (Recommended), as they are alternate measures not recommended.

The following alternative energy measures are also recommended for further study:

- Photovoltaic (PV) Rooftop Solar Power Generation – 70kW System

If NPS implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	35,661	25,100	30%
Electricity (kWh)	145,934	107,201	27%
Natural Gas (therms)	9,368	5,704	39%
Site EUI (kbtu/SF/Yr)	67.5	44.1	



Please note that these energy conservation measures are all compatible with the school's existing electrical system if the right equipment is chosen. The only limitation found in this study is that the utility company might require the capacity of the solar PV system to be less than 250 kW in order to be connected to the electric grid. Therefore, all the solar PV systems are sized to be less than 250 kW.

2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

The following is a summary of building information related to HVAC, plumbing, building envelope, lighting, kitchen equipment and domestic hot water systems as observed during CHAs site visit. See appendix B for detailed information on mechanical equipment, including capacities, model numbers and age. See appendix F for some representative photos of some of the existing conditions observed while onsite.

Building Name: Elmer Elementary School
Address: 207 Front Street, Elmer, NJ 08318
Gross Floor Area: 21,240 Square Feet
Number of Floors: 1
Year Built: 1956

Description of Spaces: Classrooms, offices, multipurpose room, computer lab, storage rooms, toilet rooms and a mechanical room.
Description of Occupancy: The school serves about 200 students from 1st to 2nd grade. There are about 23 school faculty and staff members.
Number of Computers: The school has approximately 50 desktop and laptop computers.
Building Usage: Hours of operation are 8:10 AM – 2:45 PM Monday through Friday, with various after-school activities until 6:00 PM.
Construction Materials: The building is constructed of structural standard concrete masonry units (CMU) with bricks façade and fiberglass panels above the windows. An ECM relative to the fiberglass panel insulation is evaluated.
Roof: The building has both a pitched roof and a flat roof. The pitched roof is covered with shingles. The flat roof is covered with white rubber membrane. It is believed that the roof is well insulated according to the facility staff. The roof is in good condition and therefore no ECMs associated with roof replacement are evaluated.
Windows: The windows throughout the building are double pane aluminum framed windows. Windows are in good condition and no ECMs associated with window replacement are evaluated.

Exterior Doors: Exterior doors are steel doors with safety glass. Sweeps on exterior doors are still in good condition. Therefore no ECMs have been evaluated.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: The building is heated by a heating hot water (HHW) system. The HHW is provided by an H. B. Smith boiler which has a rated energy input of 1,773 MBH. The HHW is circulated to the baseboard heaters, unit ventilators (UV) and heating ventilating (HV) units by two lead/lag pumps. Each pump is driven by a 2 HP Marathon Electric motor. Each classroom has a Nesbitt UV unit and fin-tube baseboard heater. The multipurpose room has two heating ventilating (HV) units equipped with HHW coils to provide heating and ventilation for the room. In addition to the HHW system, the computer lab is cooled by a Fijitsu heat pump, the Fijitsu unit has a rated heating capacity of 17.2 MBH.

Cooling: The classrooms, teachers' lounge and offices are cooled by (17) Mitsubishi or Fijitsu ductless split units. Each unit has a rated cooling capacity of 1 to 1.5 tons depends on the size of the classroom. The condensers are located on the ground outside. Similarly, the office rooms are cooled by four split units which have condensers located on the roof. The computer lab is cooled by a Fijitsu split units, this Fijitsu unit has a rated cooling capacity of 1.5 ton.

An ECM relative to HHW boiler replacement is included.

Ventilation: The ventilation for the classrooms and offices is provided by Nessbitt unit ventilators (UV) located in each room. These UVs appear to be in good condition. The multipurpose room is ventilated by two heating ventilating (HV) units. The amount of the fresh air from these two units is unknown due the inaccessibility to the units. No ECMs are associated with ventilation system.

Exhaust: The building has several exhaust fans for restrooms and general exhaust. The exhaust fans are located on the roof, but the capacities of the fan motors are unknown due to the fans are all enclosed in the ductwork.

No ECMs associated with ventilation and exhaust system are included.

Controls Systems

The school has a CM3 central direct digital control (DDC) system. The boiler and room temperatures are controlled by the DDC system. A temperature setback program is programmed in the system. However, the cooling units in Elmer are controlled locally. Some of the split units are controlled by programmable thermostats. However, there are still some of them are controlled by manual non-programmable controller. An ECM relative to install programmable thermostats is evaluated.

Domestic Hot Water Systems

The school has two electric domestic hot water (DHW) heaters. One Bradford White heater has a rated 3.5kW heating capacity and 40 gallon storage. The other heater is covered with insulation and no nameplate was available. According to the facility staff, this heater is the same size as the Bradford White unit.

An ECM is included to evaluate the replacement of the electric heaters with a high efficiency condensing gas domestic water heater.

Kitchen Equipment

This building does not have a kitchen. All food preparation is done elsewhere.

Plumbing Systems

The urinals in the building are waterless urinals and the toilets also appear to be low flow types. The faucets have low-flow (0.5GPM) aerators. In discussions with school staff, the school has been progressively replacing the old plumbing fixtures with low flow or waterless urinals. Also, the school has its own well water system for the water usage. No ECMs have been evaluated for water savings.

Plug Load

This school has computers, copiers, residential appliances (microwave, refrigerator) and printers which contribute to the plug load in the building. No ECMs have been evaluated for plug load.

Lighting Systems

The lighting system consists of 32W T8 fluorescent fixtures, LED tube lights and some metal halide fixtures. The majority of lighting fixtures in the building are T8 fluorescent recessed or surface mounted lensed fixtures. The multipurpose room has fourteen (14) high bay metal halide fixtures and the computer lab has thirteen (13) LED tube lights. All the lights in this building are controlled by manual switches or key switches. After discussion with facility staff, it was noted that the classroom lights are typically turned off after cleaning the rooms at 11PM and the hallway lights are on 24/7. We have provided three alternatives for lighting that include adding occupancy sensors to the existing lights, replacing the lights with LED lights and a third ECM that evaluates adding occupancy sensors to the proposed LED lights.

3.0 UTILITIES

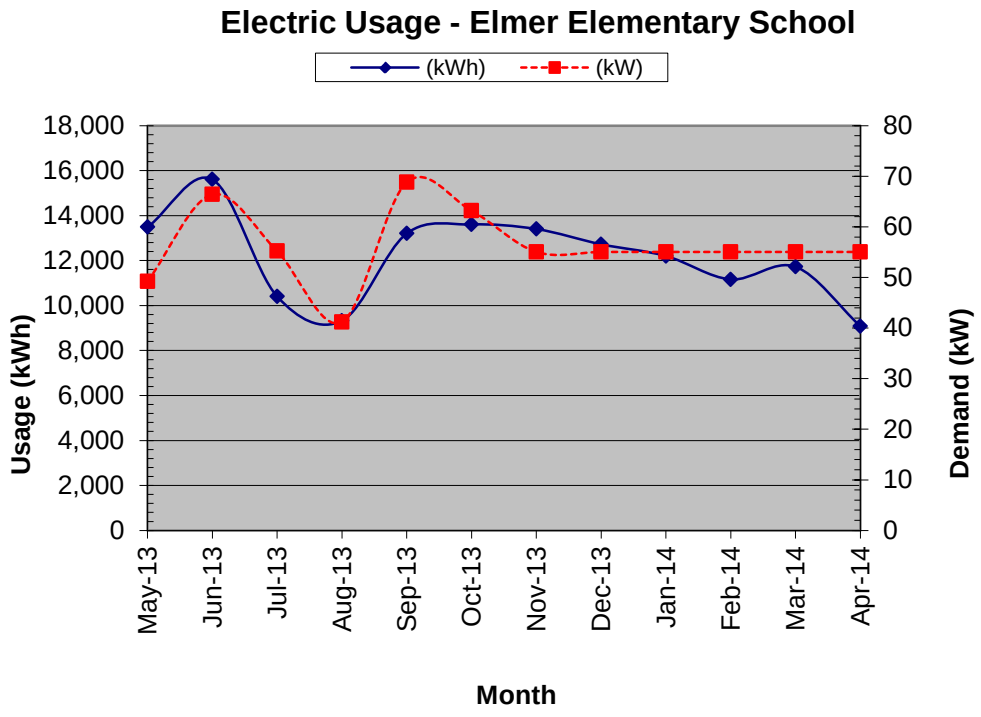
Utilities used by the building are delivered and supplied by the following utility companies:

	Electric	Natural Gas
Deliverer	Atlantic City Electric	South Jersey Gas
Supplier	Constellation	Woodruff Energy

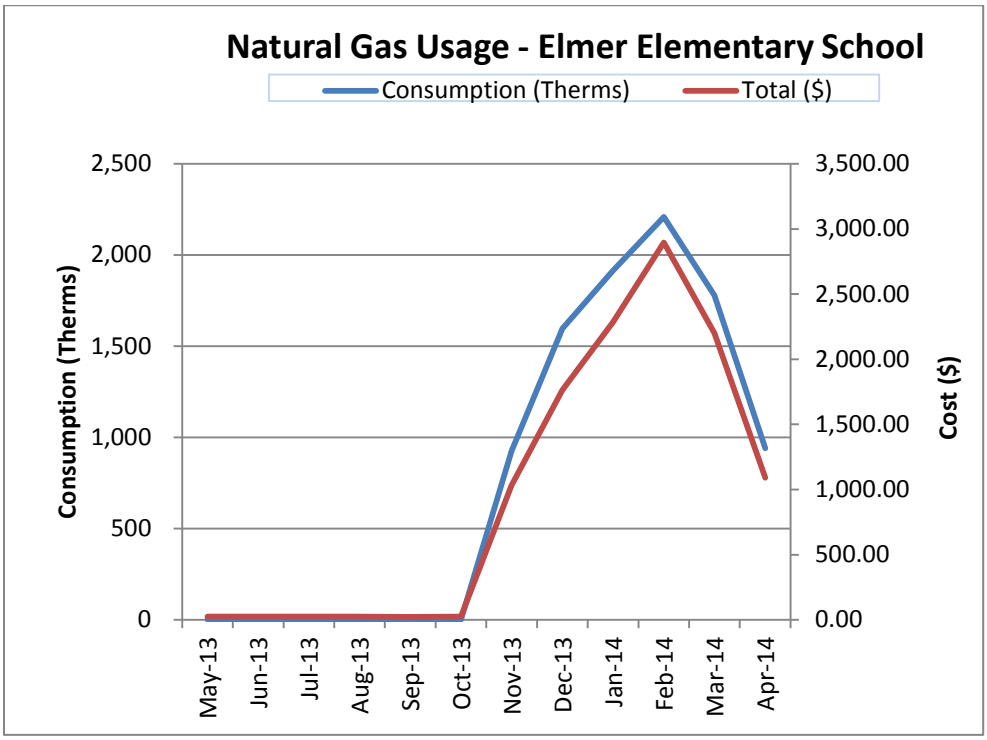
For the 12-month period ending in April 2014, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	145,934	kWh
Annual Cost	$24,248	$
Blended Unit Rate	$0.17	$/kWh
Supply Rate	$0.13	$/kWh
Demand Rate	$7.13	$/kW
Peak Demand	68.8	kW
Natural Gas		
Annual Consumption	9,368	Therms
Annual Cost	$11,414	$
Unit Rate	$1.22	$/therm

Blended Rate: Average rate charged determined by the annual cost / annual usage
Supply Rate: Actual rate charged for electricity usage in kWh (based on most recent electric bill)
Demand Rate: Rate charged for actual electrical demand in kW (based on most recent electric bill)



The electric usage is pretty consistent throughout the year and varies with the usage of the building. In May and June, the electric usage is higher than other months because of the cooling usage, but then drops off sharply in July and August.



Natural gas was consumed by the heating boilers only. Therefore, the usage during non-heating seasons is zero. The natural gas usage during the heating season is correlated to winter weather conditions.

See Appendix A for a utility analysis.

Under New Jersey's energy deregulation law, the supply portion of the electric (or natural gas) bill is separated from the delivery portion. The supply portion is open to competition, and customers can shop around for the best price for their energy suppliers. The electric and natural gas distribution utilities will still deliver the gas/ electric supplies through their wires and pipes – and respond to emergencies, should they arise – regardless of where those supplies are purchased. Purchasing the energy supplies from a company other than your electric or gas utility is purely an economic decision; it has no impact on the reliability or safety of the service.

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	School Average Rate	NJ Average Rate	
Electricity	$/kWh	$0.17	$0.13	Y
Natural Gas	$/Therm	$1.22	$0.96	Y

* Per U.S. Energy Information Administration (2013 data – Electricity and Natural Gas, 2012 data – Fuel Oil)

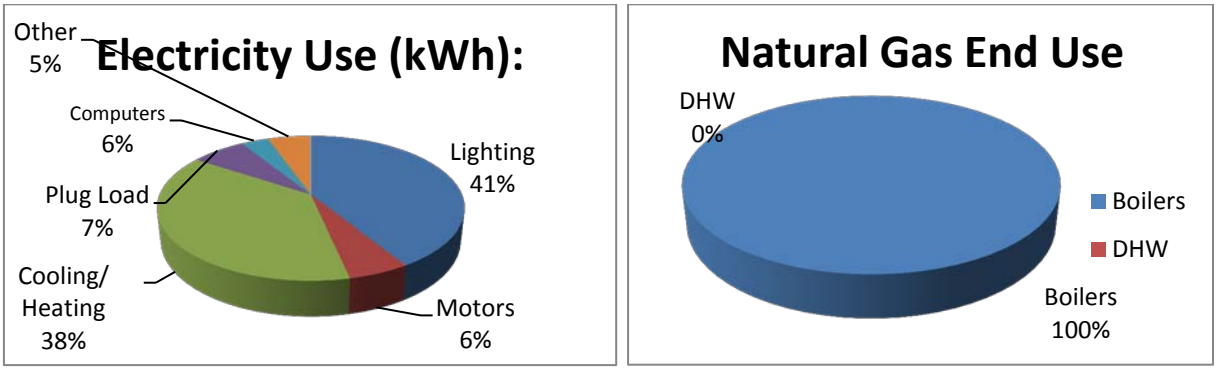
Additional information on selecting a third party energy supplier is available here:

http://www.state.nj.us/bpu/commercial/shopping.html.

See Appendix A for a list of third-party energy suppliers licensed by the Board of Public Utilities to sell within the building's service area.

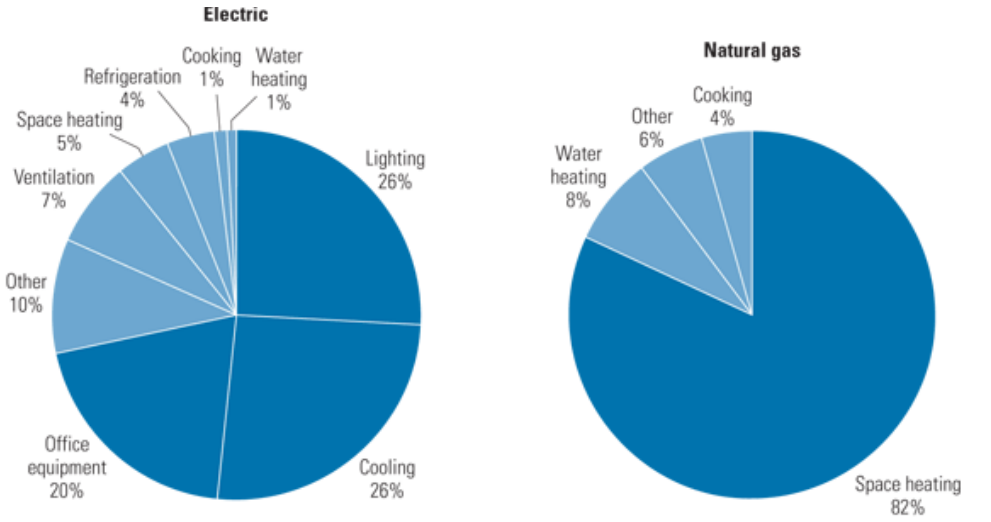
The charts below represent estimated utility end-use utility profiles for the building. The values used within the charts were estimated from a review of the utility analysis and the energy savings calculations.

Site End-Use Utility Profile



Most of the electricity consumed by educational facilities is used to for lighting, cooling, and plug loads such as computers and copiers; most of the natural gas is used for space heating. Each school's energy profile is different, and the following charts represent typical utility profiles for K-12 schools per U.S. Department of Energy.

Typical End-Use Utility Profile for Educational Facilities



Courtesy: E SOURCE; from Commercial Building Energy Consumption Survey, 1999 data

4.0 BENCHMARKING

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

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

Site EUI kBtu/ft^2/yr	Source EUI kBtu/ft^2/yr	Energy Star Rating (1-100)
67.5	119.9	68

The school has an above average Energy Star Rating Score (50 being the median score), and is considered an energy efficient building.

5.0 ENERGY CONSERVATION MEASURES

The following types of energy savings opportunities are identified in this section of the report:

- Energy conservation measures (ECMs) are energy savings recommendations that typically require a financial investment. For these areas of opportunity, CHA prepared detailed calculations, as summarized in this section and in Appendix C. In general, additional savings may exist from reductions in maintenance activities associated with new equipment or better controls; however for conservatism, maintenance savings are not accounted for in this report; instead the only savings which are reported are those derived directly from reductions in energy which can be tracked by the utility bills.

- Operational and Maintenance measures (O&M) consist of low- or no-cost operational opportunities, which if implemented would have positive impacts on overall building operation, comfort levels, and/or energy usage. There are no estimated savings, costs or paybacks associated with the O&M measures included as part of this study.

Energy savings were quantified in the form of:

- electrical usage (kWh=Kilowatt-hour),
- electrical demand (kW=kilowatts),
- natural gas (therms=100,000 Btu),
- propane gas (gallons=91,650 Btu),
- fuel oil (gallons =138,700 Btu), and
- water (kgal=1,000 gallons).

These recommendations are influenced by the time period that it takes for a proposed project to "break even" referred to as "Simple Payback". Simple payback is calculated by dividing the estimated cost of implementing the ECM by the energy cost savings (in dollars) of that ECM.

Another financial indicator of the performance of a particular ECM is the Return on Investment or ROI, which represents the benefit (annual savings over the life of a project) of an investment divided by the cost of the investment. The result is expressed as a percentage or ratio.

Two other financial analyses included in this report are Internal Rate of Return (IRR) and Net Present Value (NPV). Internal Rate of Return is the discount rate at which the present value of a project costs equals the present value of the project savings. Net Present Value is the difference between present value of an investment's future net cash flows and the initial investment. If the NPV equals "0", the project would equate to investing the same amount of dollars at the desired rate. NPV is sometimes referred to as Net Present Worth. These values are provided in the Summary Tab in Appendix C.

5.1 ECM-1 Add Insulation on Exterior Wall Panels

The building exterior wall has approximately (136) 4' by 4' translucent fiberglass panels. During the site visit, it was observed that these panels were covered with paintings or curtains, and do not provide daylight from outdoor for illumination. These thin panels and poor insulated characteristics result in excessive heating load in the winter and cooling load in the summer. Adding insulation to the panels will result in reduced heating and cooling loads and save energy.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-1 Add Insulation on Exterior Wall Panels

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
23,000	0	438	1,348	1,715	1.2	0	13.4	13.4

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is recommended.

5.2 ECM-2 Replace Boilers with Condensing Boilers

The existing H. B. Smith boiler which has a rated energy input of 1,773 MBH is non-condensing type and has maximum combustion efficiencies in the 80% range. New modulating condensing gas boilers are available that minimally operate at 88%, and can operate as high as 96%. This ECM assesses the replacement of one of the boilers with two centrally located modulating condensing gas boilers which will provide the same amount of hot water in the building and run as the master boilers.

To implement this ECM, The boiler would be replaced with the new condensing boilers in the mechanical room at the same location of the old boiler. Piping, venting and wiring modifications would be needed.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-2 Replace Boilers with Condensing Boilers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
115,543	0	0	2,316	2,821	(0.4)	5,250	41.0	39.1

* Incentive shown is per the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is recommended because the condensing boilers would not only be more energy efficiency but also have more advanced control system for operators and meeting the heating load.

5.3 ECM-3 Install Programmable Thermostats on Split Units

The existing split units for cooling are controlled by remote manual thermostats and it was noted that some of them were kept running after the school hours. It is suggested that digital programmable thermostats be installed to control these units and reset the temperature during unoccupied hours. The new thermostats will be able to set a schedule for occupied and unoccupied setpoints. Savings are seen from temperature scheduling for occupied and unoccupied hours.

The cost of implementing this measure includes installing the programmable thermostats, wiring and disconnecting the old thermostats, and the labor cost for programming these new thermostats.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-3 Install Programmable Thermostats on Split Units

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
4,125	0	2,253	0	313	0.9	0	13.2	13.2

* Does not qualify for Incentive from the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities

This measure is recommended.

5.4 ECM-4 Replace Electric DHW Heaters with Gas Fired Condensing DHW Heaters

The building has two electric domestic hot water (DHW) heaters to provide the DHW for sinks. Each heater has a rated 3.5kW heating capacity and 40 gallon storage. Energy savings could be realized by replacing this heater with a high efficiency condensing gas fired heaters, which can operate at efficiencies up to 96%.

Savings are calculated based on the DHW supply temperature, estimated DHW usage, and standby heat loss from the storage tank. Standby heat loss from the storage tank was evaluated based on the tank size and Department of Energy's averaged heat loss rate for hot water tanks. The efficiency of the gas-fired condensing water heater is 96% per manufacturer's data. Implementation of this measure will require installation of the gas fired condensing water heaters, gas pipes, gas regulators, and PVC pipes for flue gas exhausting.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-4 Replace Electric DHW Heaters with Gas Fired Condensing DHW Heaters

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
34,365	7	4,786	-170	1,028	(0.3)	100	33.4	33.3

* Incentive shown is per the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is recommended because the simple payback of the projects including this one is less than 15 years.

5.5 ECM-L1 Lighting Replacement / Upgrades

The lighting system consists of 32W T8 fluorescent fixtures some LED tube lights and some metal halide fixtures. The school has trialed installing some LED lights in the computer lab without going through the NJBPU incentive program. It is suggested that the school replace all of the lights with LED lights and take advantage of NJBPU incentive program in section 6.0.

Overall energy consumption can be reduced by replacing inefficient bulbs and linear fluorescent bulbs with more efficient LED lamps and removing ballasts. To compute the annual savings for this ECM, the energy consumption of the current lighting fixtures was established and compared to the proposed fixture power requirement with the same annual hours of operation. The difference between the existing and proposed annual energy consumption was the energy savings. These calculations are based on 1 to 1 replacements of the fixtures, and do not take into account lumen output requirements for a given space. A more comprehensive engineering study should be performed to determine correct lighting levels.

Supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture, are provided in Appendix C and summarized below:

ECM-L1 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
48,440	11	32,496	0	5,241	0.3	2,750	9.2	8.7

* LED retrofits must go through the “custom” measures incentive option under New Jersey SmartStart Program. There are no “prescriptive” incentives for LED retrofits. Projects must achieve a minimum of 75,000 kWh annual savings to qualify for “custom” incentives. See section 6.0 for other incentive opportunities

This measure is not recommended in lieu of ECM L3.

5.6 ECM-L2 Install Lighting Controls (Occupancy Sensors)

Presently, all interior lighting fixtures are controlled by wall mounted switches. Review of the comprehensive lighting survey determined that lighting in some areas could benefit from installation of occupancy sensors to turn off lights when they are unoccupied.

This measure recommends installing occupancy sensors for the current lighting system. Using a process similar to that utilized in the lighting replacement section, the energy savings for this measure was calculated by applying the known fixture wattages in the space to the estimated existing and proposed times of operation for each fixture.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
5,643	0	7,444	0	990	1.2	745	5.7	4.9

* Incentive shown is per the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is not recommended in lieu of ECM L3.

5.7 ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

This measure is a combination of ECM-L1 and ECM-L2; recommending replace/upgrade the current lighting fixtures to more efficient ones and installing occupancy sensors on the new lights. Interactive effects of the higher efficiency lights and occupancy sensors lead the energy and cost savings for this measure to not be cumulative or equivalent to the sum of replacing the lighting fixtures alone and installing occupancy sensors without the lighting upgrade. The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
54,083	11	36,042	0	5,713	0.3	3,495	9.5	8.9

* LED retrofits must go through the “custom” measures incentive option under New Jersey SmartStart Program. There are no “prescriptive” incentives for LED retrofits. Projects must achieve a minimum of 75,000 kWh annual savings to qualify for “custom” incentives. See section 6.0 for other incentive opportunities

Although this measure has a higher payback than ECM-L2, life cycle operations and maintenance costs will further reduce the payback period for this ECM. Therefore, this measure is recommended.

5.8 Additional O&M Opportunities

This list of operations and maintenance (O&M) - type measures represent low-cost or no-cost opportunities, which if implemented will have a positive impact on the overall building operations, comfort and/or energy consumption. The recommended O&M measures for this building are as follows:

- Replace filters in the HVAC system regularly

6.0 PROJECT INCENTIVES

6.1 Incentives Overview

The following sections give detailed information on available incentive programs including New Jersey Smart Start, Direct Install, New Jersey Pay for Performance (P4P) and Energy Savings Improvement Plan (ESIP). If the School District wishes to and is eligible to participate in the Energy Savings Improvement Plan (ESIP) program and/or the Pay for Performance Incentive Program (P4P), it cannot participate in either the Smart Start or Direct Install Programs. Refer to Appendix D for more information on the Smart Start program.

6.1.1 New Jersey Smart Start Program

For this energy audit, The New Jersey Smart Start Incentives are used in the energy savings calculations, where applicable. This program is intended for medium and large energy users and provides incentives for:

- Electric Chillers
- Gas Chillers
- Gas Heating
- Unitary HVAC
- Ground Source Heat Pumps
- Variable frequency Drives/ motors
- Refrigeration
- Prescriptive and performance lighting and lighting controls

The equipment is procured using a typical bid- build method, installed and paid for and then the incentives are reimbursed to the owner.

Refer to Appendix D for more information on the Smart Start program.

6.1.2 Direct Install Program

The Direct Install Program applies to smaller facilities that have a peak electrical demand of 200 kW or less in any of the previous 12 months. Buildings must be located in New Jersey and served by one of the state's public, regulated electric utility companies.

Direct Install is funded through New Jersey's Clean Energy Program and is designed to provide capital for building energy upgrade projects to fast track implementation. The program will pay up to 70% of the costs for lighting, HVAC, motors, refrigeration, and other equipment upgrades with higher efficiency alternatives. If a building is eligible for this funding, the Direct Install Program can reduce the implementation cost of energy conservation projects.

The Direct Install program has specific HVAC equipment and lighting requirements and is generally applicable only to smaller package HVAC units, small boilers and lighting retrofits.

The program pays a maximum amount of $75,000 per building, and up to $250,000 per customer per year. Installations must be completed by an approved Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this energy audit. The incentive is reimbursed to the Owner upon successful replacement and payment of the equipment.

The building qualifies for this program because its electrical demand is less than the maximum peak electrical demand of 200 kW for the last 12 month period.

Refer to Appendix D for more information on this program.

6.1.3 New Jersey Pay For Performance Program (P4P)

This building may be eligible for incentives from the New Jersey Office of Clean Energy. The most significant incentives are available from the New Jersey Pay for Performance (P4P) Program. The P4P program is designed to offset the cost of energy conservation projects for facilities that pay the Societal Benefits Charge (SBC) and whose demand (kW) in any of the preceding 12 months exceeds 100 kW. This demand minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations and *is not applicable to public schools*. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). Additionally, the overall return on investment (ROI) must exceed 10%. If the participant is a municipal electric company customer, and a customer of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. Available incentives are as follows:

Incentive #1: Energy Reduction Plan – This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP). The ERP must include a detailed energy audit of the desired ECMs, energy savings calculations (using building modeling software) and inputting of all utility bills into the EPA Portfolio Manager website.

- Incentive Amount: $0.10/SF
- Minimum incentive: $5,000
- Maximum Incentive: $50,000 or 50% of Facility annual energy cost

The standard incentive pays $0.10 per square foot, up to a maximum of $50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an initial 75% incentive toward performance of the energy audit, facilities are only eligible for an additional $0.05 per square foot, up to a maximum of $25,000, rather than the standard incentive noted above. The ERP must be completed by a Certified Energy Manager (CEM) and submitted along with the project application.

Incentive #2: Installation of Recommended Measures – This incentive is based on projected energy savings as determined in Incentive #1 (Minimum 15% savings must be achieved), and is paid upon successful installation of recommended measures.

Electric

- Base incentive based on 15% savings: $0.09/ per projected kWh saved.
- For each % over 15% add: $0.005 per projected kWh saved.
- Maximum incentive: $0.11/ kWh per projected kWh saved.

Gas

- Base incentive based on 15% savings: $0.90/ per projected Therm saved.
- For each % over 15% add: $0.05 per projected Therm saved.
- Maximum incentive: $1.25 per projected Therm saved.

Incentive cap: 25% of total project cost

Incentive #3: Post-Construction Benchmarking Report – This incentive is paid after acceptance of a report proving energy savings over one year utilizing the Environmental Protection Agency (EPA) Portfolio Manager benchmarking tool.

Electric

- Base incentive based on 15% savings: $0.09/ per projected kWh saved.
- For each % over 15% add: $0.005 per projected kWh saved.
- Maximum incentive: $0.11/ kWh per projected kWh saved.

Gas

- Base incentive based on 15% savings: $0.90/ per projected Therm saved.
- For each % over 15% add: $0.05 per projected Therm saved.
- Maximum incentive: $1.25 per projected Therm saved.

Combining Incentives #2 and #3 will provide a total of $0.18/ kWh and $1.8/therm not to exceed 50% of total project cost. Additional Incentives for #2 and #3 are increased by $0.005/kWh and $0.05/therm for each percentage increase above the 15% minimum target to 20%, calculated with the EPA Portfolio Manager benchmarking tool, not to exceed 50% of total project cost.

For the purpose of demonstrating the eligibility of the ECM's to meet the minimum savings requirement of 15% annual savings and 10% ROI for the Pay for Performance Program, all ECM's identified in this report have been included in the incentive calculations. The results for the building are shown in Appendix C, with more detailed program information in Appendix D.

6.1.4 Energy Savings Improvement Plan

The Energy Savings Improvement Program (ESIP) allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. Under the recently enacted Chapter 4 of the Laws of 2009 (the law), the ESIP provides all government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.

ESIP allows local units to use "energy savings obligations" (ESO) to pay for the capital costs of energy improvements to their facilities. ESIP loans have a maximum loan term of 15 year. ESOs are not considered "new general obligation debt" of a local unit and do not count against debt limits or require voter approval. They may be issued as refunding

bonds or leases. Savings generated from the installation of energy conservation measures pay the principal of and interest on the bonds; for that reason, the debt service created by the ESOs is not paid from the debt service fund, but is paid from the general fund.

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. Pursuing a Local Government Energy Audit through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach. The “Local Finance Notice” outlines how local governments can develop and implement an ESIP for their facilities. The ESIP can be prepared internally if the entity has qualified staff. If not, the ESIP must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs. Refer to Appendix D for more information on this program.

6.1.5 Renewable Energy Incentive Program

The Renewable Energy Incentive Program (REIP) is part of New Jersey's efforts to reach its Energy Master Plan goals of striving to use 30 percent of electricity from renewable sources by 2020.

Incentives for sustainable bio-power projects and for energy storage projects are currently under development, with competitive solicitations for each of those technologies expected to begin in the first quarter of 2014. The wind program is currently on hold.

New solar projects are no longer eligible for REIP incentives, but can register for Solar Renewable Energy Certificates (SRECs) through the SREC Registration Program (SRP).

7.0 ALTERNATIVE ENERGY SCREENING EVALUATION

7.1 Solar

7.1.1 Photovoltaic Rooftop Solar Power Generation

The building was evaluated for the potential to install ground mounted photovoltaic (PV) solar panels for power generation. As part of this evaluation, CHA reviewed a previous study conducted by Blue Sky Solar Power. According to the Blue Sky Solar Power PV study report, the Atlantic City Electric (ACE) circuit serving the school is limited to 250 kW AC of generating capacity. In discussing with the school staff, it was noted that the school has sufficient land/ground space for the solar PV panels, and that roof mounted systems were not desired. Therefore, the ground mounted PV is sized based on lower number of the building electricity usage and the 250 kW limit.

Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The table below summarizes the approximate solar array size that can be installed to provide electricity for the building.

Potential PV Array Size **(kW)**
70

The PVWATTS solar power generation model was utilized to calculate PV power generation; this model is provided in Appendix E.

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey Solar Renewable Energy Certificates Program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. Payments that will be received by the PV producer (school) will change from year to year dependent upon supply and demand. There is no definitive way to calculate an exact price that will be received by the PV producer for SREC credits over the next 15 years. Renewable Energy Consultants estimates an average of $175/SREC for June 2014 and this number was utilized in the cash flow for this report.

The system costs for PV installations were derived from recent solar contractor budgetary pricing in the state of New Jersey and include the total cost of the system installation (PV panels, inverters, wiring, ballast, controls). The cost of installation is currently about $4.00 per watt or $4,000 per kW of installed system, for a typical system. There are other considerations that have not been included in this pricing, such as the condition of the roof and need for structural reinforcement. Photovoltaic systems can be ground mounted if the roof is not suitable, however, this installation requires a substantial amount of open property (not wooded) and underground wiring, which adds

more cost. PV panels have an approximate 20 year life span; however, the inverter device that converts DC electricity to AC has a life span of 10 to 12 years and will most likely need to be replaced during the useful life of the PV system.

The implementation cost and savings related to this ECM are presented in Appendix E and summarized as follows:

Photovoltaic (PV) Rooftop Solar Power Generation – 70 kW System

Budgetary Cost	Annual Utility Savings			Total Savings	New Jersey Renewable SREC	Payback (without SREC)	Payback (with SREC)	Recommended
	Electricity		Natural Gas					
$	kW	kWh	Therms	$	$	Years	Years	Y/N
$280,000	70.0	113,664	0	$19,437	$19,891	14.4	7.1	FS

Note: Since the school has completed a detailed solar PV study, before implementation is pursued, CHA recommends the school district consult with certified solar PV contractor(s) and the electric company to refine pricing and savings estimate.

7.1.2 Solar Thermal Hot Water Generation

Active solar thermal systems use solar collectors to gather the sun's energy to heat a fluid. An absorber in the collector (usually black colored piping) converts the sun's energy into heat. The heat is transferred to circulating water, antifreeze, or air for immediate use or is storage for later utilization. Applications for active solar thermal energy include supplementing domestic hot water, heating swimming pools, space heating or preheating air in residential and commercial buildings.

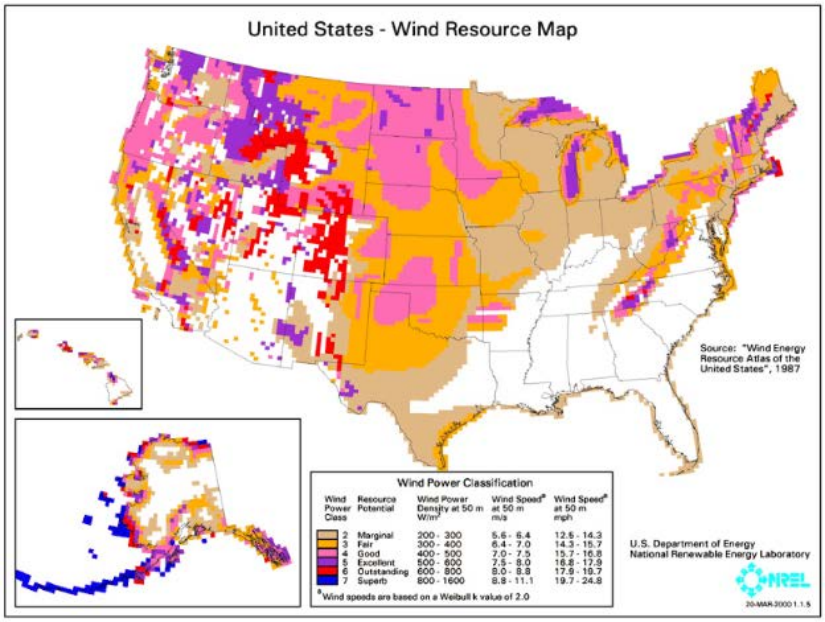
A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. Systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually placed on the roof of the building, oriented south, and tilted at the same angle as the site's latitude, to maximize the amount of solar radiation collected on a yearly basis.

Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping). The most practical system would transfer the heat from the panels to thermal storage tanks and then use the pre-heated water for domestic hot water production. DHW is presently produced by natural gas fired water heaters and, therefore, this measure would offer natural gas utility savings. Unfortunately, the amount of domestic hot water that is currently used by this school is very small. Installing a solar domestic hot water system is not recommended due to the limited amount of domestic hot water presently consumed by the school.

This measure is not recommended due to the relatively low domestic hot water usage.

7.2 Wind Powered Turbines

Wind power is the conversion of kinetic energy from wind into mechanical power that is used to drive a generator which creates electricity by means of a wind turbine. A wind turbine consists of rotor and blades connected to a gearbox and generator that are mounted onto a tower. Newer wind turbines also use advanced technology to generate electricity at a variety of frequencies depending on the wind speed, convert it to DC and then back to AC before sending it to the grid. Wind turbines range from 50 – 750 kW for utility scale turbines down to below 50 kW for residential use. On a scale of 1 (the lowest) to 7 (the highest), Class 3 and above (wind speeds of 13 mph or greater) are generally considered "good wind resource" according to the Wind Energy Development Programmatic EIS Information Center hosted by the Bureau of Land Management. According to the map below, published by NREL, Newark, NJ is classified as Class 1 at 50m, meaning the city would not be a good candidate for wind power.



This measure is not recommended due to the location of the school.

7.3 Combined Heat and Power Plant

Combined heat and power (CHP), cogeneration, is self-production of electricity on-site with beneficial recovery of the heat byproduct from the electrical generator. Common CHP equipment includes reciprocating engine-driven, micro turbines, steam turbines, and fuel cells. Typical CHP customers include industrial, commercial, institutional, educational institutions, and multifamily residential facilities. CHP systems that are commercially viable at the present time are sized approximately 50 kW and above, with numerous options in blocks grouped around 300 kW, 800 kW, 1,200 kW and larger. Typically, CHP systems are used to produce a portion of the electricity needed by a facility some or all of the time, with the balance of electric needs satisfied by purchase from the grid.

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. The building has sufficient need for electrical generation and the ability to use most of the thermal byproduct during the winter; however thermal usage during the summer months does not exist. Thermal energy produced by the CHP plant in the warmer months will be wasted. An absorption chiller could be installed to utilize the heat to produce chilled water; however, there is no chilled water distribution system in the building. CHP is not recommended due to the building's limited summer thermal demand.

This measure is not recommended due to the absence of year-round thermal loads which are needed for efficiency CHP operation.

7.4 Demand Response Curtailment

Presently, electricity is delivered by PSE&G, which receives the electricity from regional power grid RFC. PSE&G is the regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia including the State of New Jersey.

Utility Curtailment is an agreement with the utility provider's regional transmission organization and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and utility provider offers incentives to the CSP to participate in this program. Enrolling in the program will require program participants to drop electrical load or turn on emergency generators during high electrical demand conditions or during emergencies. Part of the program also will require that program participants reduce their required load or run emergency generators with notice to test the system.

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From January 2013 through December 2013 the following table summarizes the electricity load profile for the building.

Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
68.8	41.2	56.2	N	N

This measure is not recommended because the building does not have adequate load to meet the required minimum load reduction.

8.0 CONCLUSIONS & RECOMMENDATIONS

The LGEA energy audit conducted by CHA for the building identified potential annual savings of $10,562/yr with an overall payback of 18.6 years, if the recommended ECMs are implemented.

The potential annual energy and cost savings for the recommended ECMs are shown in the following table.

Electric Savings (kWh)	Natural Gas Savings (therms)	Total Savings ($)	Payback (years)
38,733	3,664	10,562	18.6

The following projects should be considered for implementation:

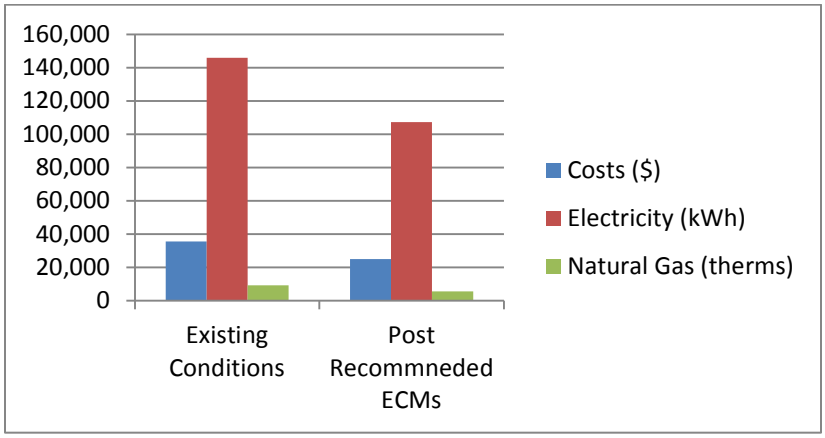
- Add Insulation on Fiberglass Wall Panels
- Install Programmable Thermostats on Split Units
- Replace Electric DHW Heaters with Gas Fired Condensing DHW Heaters
- Lighting Replacements with Controls (Occupancy Sensors)

The following alternative energy measures are recommended for further study:

- Photovoltaic (PV) Rooftop Solar Power Generation – 70 kW System

If NPS implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	35,661	25,100	30%
Electricity (kWh)	145,934	107,201	27%
Natural Gas (therms)	9,368	5,704	39%
Site EUI (kbtu/SF/Yr)	67.5	44.1	



APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

Elmer Elementary School
207 Front Street Elmer NJ 08318

Utility Bills: Account Numbers

Account Number	School Building	Location	Type	Notes
1188 6449 9991	Elmer Elementary School	207 Front Street Elmer NJ 08318	Electricity	
0353 9809 9990	Elmer Elementary School	207 Front Street Elmer NJ 08318	Electricity	
2 13 41 0052 0 1	Elmer Elementary School	207 Front Street Elmer NJ 08318	Natural Gas	

Elmer Elementary School
207 Front Street Elmer NJ 08318

For Service at: **Elmer Elementary School**
Smmary of All the Accounts:
Delivery - Atlantic City Electric
Supplier - Constellation

Electric Service

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**
May-13	13,486	49.2	920.7	1,149.0	$2,069.73	$ 1,669.43	$ 400.30	$ 0.15	$ 0.12	$ 8.14
June-13	15,607	66.4	1,113.7	1,329.8	$2,443.49	$ 1,995.95	$ 447.54	$ 0.16	$ 0.13	$ 6.74
July-13	10,407	55.2	948.6	886.7	$1,835.32	$ 1,407.86	$ 427.46	$ 0.18	$ 0.14	$ 7.74
August-13	9,323	41.2	825.3	794.3	$1,619.62	$ 1,446.34	$ 173.28	$ 0.17	$ 0.16	$ 4.21
September-13	13,202	68.8	1,086.5	1,124.8	$2,211.35	$ 1,718.05	$ 493.30	$ 0.17	$ 0.13	$ 7.17
October-13	13,605	63.2	1,121.1	1,159.2	$2,280.23	$ 1,796.88	$ 483.35	$ 0.17	$ 0.13	$ 7.65
November-13	13,404	55.0	987.6	1,142.1	$2,129.65	$ 1,761.32	$ 368.33	$ 0.16	$ 0.13	$ 6.69
December-13	12,724	55.0	999.7	1,084.1	$2,083.78	$ 1,689.14	$ 394.64	$ 0.16	$ 0.13	$ 7.17
January-14	12,204	55.0	1,035.1	1,039.8	$2,074.91	$ 1,640.80	$ 434.11	$ 0.17	$ 0.13	$ 7.89
February-14	11,164	55.0	925.1	951.2	$1,876.27	$ 1,494.78	$ 381.49	$ 0.17	$ 0.13	$ 6.93
March-14	11,724	55.0	945.0	998.9	$1,943.95	$ 1,562.46	$ 381.49	$ 0.17	$ 0.13	$ 6.93
April-14	9,084	55.0	905.5	774.0	$1,679.46	$ 1,258.51	$ 420.95	$ 0.18	$ 0.14	$ 7.65
Total (last 12-months)	**145,934**	**68.80**	**$11,813.80**	**$12,433.97**	**$24,247.77**	**$19,441.53**	**$4,806.24**	**$ 0.166**	**$ 0.133**	**$ 7.128**
Notes:	1	2	3	4	5	6	7	8	9	10

1.) Number of kWh of electric energy used per month
2.) Number of kW of power measured
3.) Electric charges from Delivery provider
4.) Electric charges from Supply provider
5.) Total charges (Delivery + Supplier)
6.) Charges based on the number of kWh of electric energy used
7.) Charges based on the number of kW of power measured
8.) Total Charges ($) / Consumption (kWh)
9.) Consumption Charges ($) / Consumption (kWh)
10.) Demand Charges ($) / Demand (kW)

Supply Rate Fixed/Averaged:
$0.0852

Account #1:

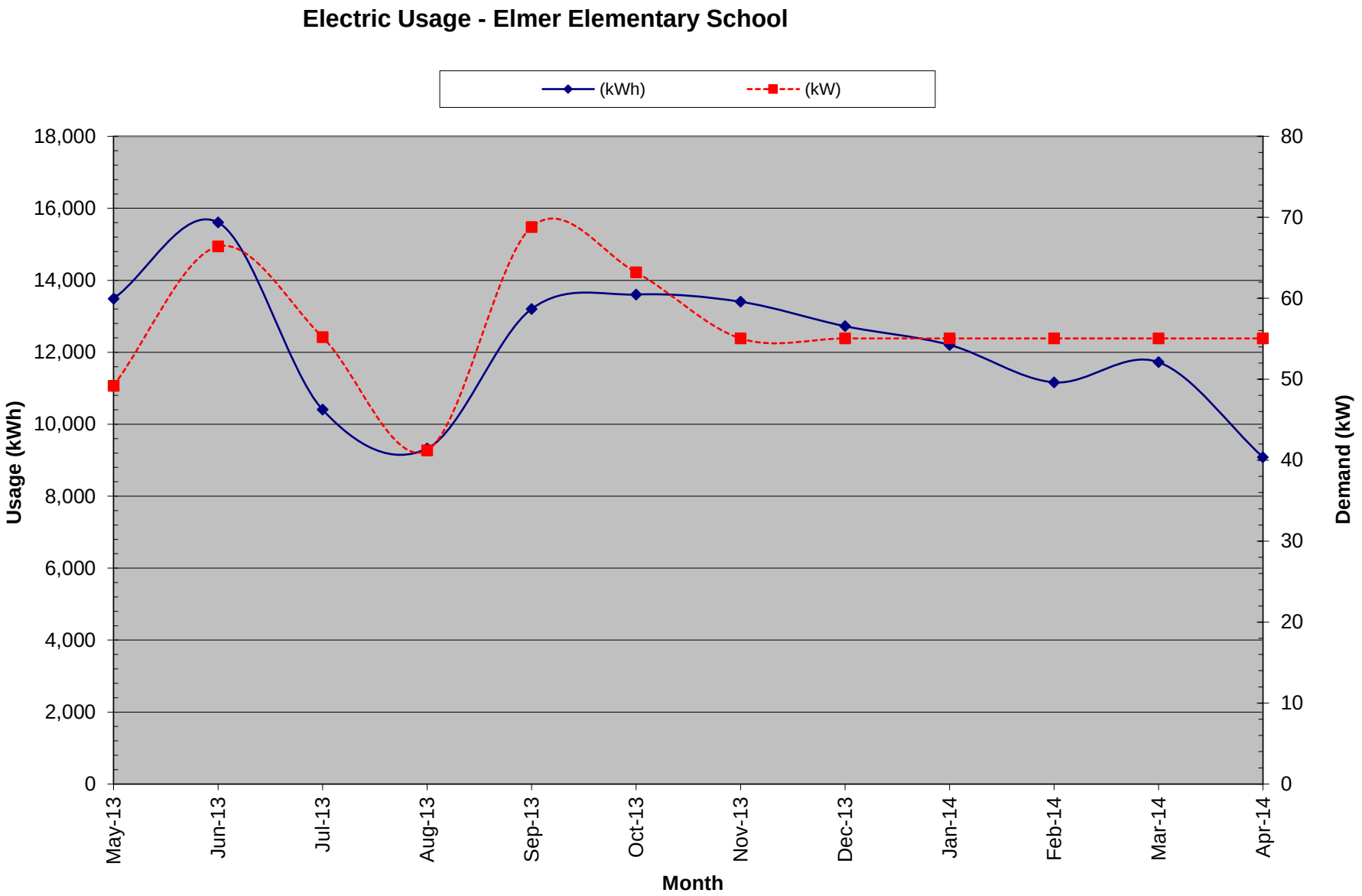
For Service at: **Elmer Elementary School**
Account No.: **1188 6449 9991**
Meter No.: **41617611**
Electric Service
Delivery - Atlantic City Electric
Supplier - Constellation

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**
May-13	6	0.0	$ 5.43	0.5	$5.94	$ 5.94	$ -	$ 0.99	$ 0.99	#DIV/0!
June-13	7	0.0	$ 5.71	0.6	$6.31	$ 6.31	$ -	$ 0.90	$ 0.90	#DIV/0!
July-13	7	0.0	$ 11.99	0.6	$12.59	$ 12.59	$ -	$ 1.80	$ 1.80	#DIV/0!
August-13	3	0.0	$ 5.28	0.3	$5.54	$ 5.54	$ -	$ 1.85	$ 1.85	#DIV/0!
September-13	2	0.0	$ 5.36	0.2	$5.53	$ 5.53	$ -	$ 2.77	$ 2.77	#DIV/0!
October-13	5	0.0	$ 5.94	0.4	$6.37	$ 6.37	$ -	$ 1.27	$ 1.27	#DIV/0!
November-13	4	0.0	$ 5.18	0.3	$5.52	$ 5.52	$ -	$ 1.38	$ 1.38	#DIV/0!
December-13	4	0.0	$ 5.53	0.3	$5.87	$ 5.87	$ -	$ 1.47	$ 1.47	#DIV/0!
January-14	4	0.0	$ 6.04	0.3	$6.38	$ 6.38	$ -	$ 1.60	$ 1.60	#DIV/0!
February-14	4	0.0	$ 5.35	0.3	$5.69	$ 5.69	$ -	$ 1.42	$ 1.42	#DIV/0!
March-14	4	0.0	$ 5.35	0.3	$5.69	$ 5.69	$ -	$ 1.42	$ 1.42	#DIV/0!
April-14	4	0.0	$ 5.87	0.3	$6.21	$ 6.21	$ -	$ 1.55	$ 1.55	#DIV/0!
Total (last 12-months)	**54**	**0.00**	**$73.03**	**$4.60**	**$77.63**	**$77.63**	**$0.00**	**$ 1.438**	**$ 1.438**	**#DIV/0!**

Account #2:

For Service at: **Elmer Elementary School**
Account No.: **0353 9809 9990**
Meter No.: **84534377**
Electric Service
Delivery - Atlantic City Electric
Supplier - Constellation

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**
May-13	13,480	49.2	$ 915.26	1,148.5	$2,063.79	$ 1,663.49	$ 400.30	$ 0.15	$ 0.12	$ 8.14
June-13	15,600	66.4	$ 1,108.02	1,329.2	$2,437.18	$ 1,989.64	$ 447.54	$ 0.16	$ 0.13	$ 6.74
July-13	10,400	55.2	$ 936.63	886.1	$1,822.74	$ 1,395.28	$ 427.46	$ 0.18	$ 0.13	$ 7.74
August-13	9,320	41.2	$ 820.00	794.1	$1,614.09	$ 1,440.81	$ 173.28	$ 0.17	$ 0.15	$ 4.21
September-13	13,200	68.8	$ 1,081.14	1,124.7	$2,205.82	$ 1,712.52	$ 493.30	$ 0.17	$ 0.13	$ 7.17
October-13	13,600	63.2	$ 1,115.11	1,158.8	$2,273.87	$ 1,790.52	$ 483.35	$ 0.17	$ 0.13	$ 7.65
November-13	13,400	55.0	$ 982.41	1,141.7	$2,124.13	$ 1,755.80	$ 368.33	$ 0.16	$ 0.13	$ 6.69
December-13	12,720	55.0	$ 994.13	1,083.8	$2,077.91	$ 1,683.27	$ 394.64	$ 0.16	$ 0.13	$ 7.17
January-14	12,200	55.0	$ 1,029.06	1,039.5	$2,068.53	$ 1,634.42	$ 434.11	$ 0.17	$ 0.13	$ 7.89
February-14	11,160	55.0	$ 919.72	950.9	$1,870.58	$ 1,489.09	$ 381.49	$ 0.17	$ 0.13	$ 6.93
March-14	11,720	55.0	$ 939.68	998.6	$1,938.26	$ 1,556.77	$ 381.49	$ 0.17	$ 0.13	$ 6.93
April-14	9,080	55.0	$ 899.61	773.6	$1,673.25	$ 1,252.30	$ 420.95	$ 0.18	$ 0.14	$ 7.65
Total (last 12-months)	**145,880**	**68.80**	**$11,740.77**	**$12,429.37**	**$24,170.14**	**$19,363.90**	**$4,806.24**	**$ 0.166**	**$ 0.133**	**$ 7.128**

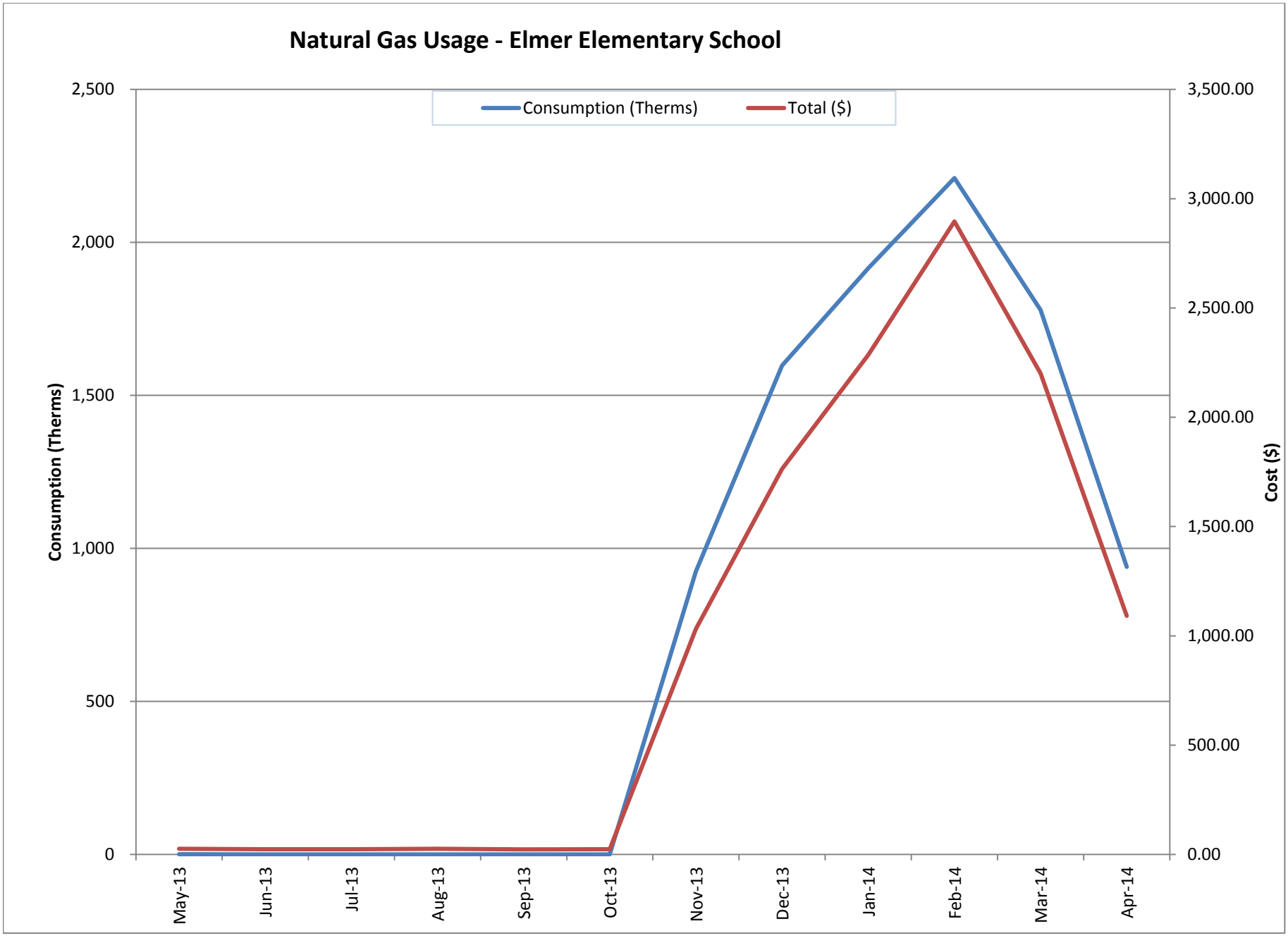


Utility Data - Elmer Elementary School
Electric Graph

Elmer Elementary School
207 Front Street Elmer NJ 08318

For Service at: **Elmer Elementary School**
Account No.: **2 13 41 0052 0 1**
Meter No.: **337444**
Natural Gas Service
Delivery - South Jersey Gas
Supplier - Woodruff Energy

		Charges			Unit Costs		
Month	**Consumption (Therms)**	**Delivery ($)**	**Supply ($)**	**Total ($)**	**Delivery ($/Therm)**	**Supply ($/Therm)**	**Total ($/Therm)**
May-13	1	$ 25	$ 0	$ 25	$ 24.21	$ 0.15	$ 24.37
June-13	0	$ 24	$ -	$ 24	$ -	$ -	$ -
July-13	0	$ 24	$ -	$ 24	$ -	$ -	$ -
August-13	0	$ 25	$ -	$ 25	$ -	$ -	$ -
September-13	0	$ 23	$ -	$ 23	$ -	$ -	$ -
October-13	0	$ 24	$ -	$ 24	$ -	$ -	$ -
November-13	925	$ 554	$ 478	$ 1,032	$ 0.60	$ 0.52	$ 1.12
December-13	1,598	$ 938	$ 825	$ 1,764	$ 0.59	$ 0.52	$ 1.10
January-14	1,915	$ 1,108	$ 1,177	$ 2,285	$ 0.58	$ 0.61	$ 1.19
February-14	2,210	$ 1,262	$ 1,634	$ 2,896	$ 0.57	$ 0.74	$ 1.31
March-14	1,779	$ 1,021	$ 1,179	$ 2,200	$ 0.57	$ 0.66	$ 1.24
April-14	940	$ 557	$ 534	$ 1,091	$ 0.59	$ 0.57	$ 1.16
Total (12 - Month)	**9,368**			**$ 11,413.56**			**$ 1.218**


Natural Gas Usage - Elmer Elementary School
Consumption (Therms)
Total ($)
Consumption (Therms)
Cost ($)
2,500
2,000
1,500
1,000
500
0
3,500.00
3,000.00
2,500.00
2,000.00
1,500.00
1,000.00
500.00
0.00
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Feb-14
Mar-14
Apr-14

ATLANTIC CITY ELECTRIC SERVICE TERRITORY
Last Updated: 10/24/12

***CUSTOMER CLASS** - **R – RESIDENTIAL C – COMMERCIAL I – INDUSTRIAL**

Supplier	Telephone & Web Site	*Customer Class
Alpha Gas and Electric, LLC 641 5th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	**R/C** **ACTIVE**
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877) 30-AMBIT (877) 302-6248 www.ambitenergy.com	**R/C** **ACTIVE**
American Powernet Management, LP 437 North Grove Street Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com	**C** **ACTIVE**
AP Gas & Electric, LLC 10 North Park Place Suite 420 Morristown, NJ 07960	(855) 544-4895 www.apge.com	**R/C/I** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(201) 384-5552	**R/C/I** **ACTIVE**
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	**C/I** **ACTIVE**
Champion Energy Services, LLC 72 Avenue L Newark, NJ 07105	(877) 653-5090 www.championenergyservices.com	**R/C/I** **ACTIVE**
Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	888-565-4490 www.4choiceenergy.com	**R/C** **ACTIVE**
Clearview Electric, Inc. 505 Park Drive Woodbury, NJ 08096	(888) CLR-VIEW (800) 746- 4702 www.clearviewenergy.com	**R/C/I** **ACTIVE**
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180	(888) 665-0955	**C/I**

Cherry Hill, NJ 08002	www.conedsolutions.com	**ACTIVE**
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(866) 237-7693 www.constellation.com	**R/C/I** **ACTIVE**
Constellation Energy 900A Lake Street, Suite 2 Ramsey, NJ 07446	(877) 997-9995 www.constellation.com	**R** **ACTIVE**

Direct Energy Business, LLC 120 Wood Avenue Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergybusiness.com	**C/I** **ACTIVE**
Direct Energy Services, LLC 120 Wood Avenue Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com	**C/I** **ACTIVE**
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, NJ 08002	(800) 282-3331 www.discountenergygroup.com	**R/C** **ACTIVE**
DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102	(877) 332-2450 www.dtesupply.com	**C/I** **ACTIVE**
Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054	(877) 866-9193 www.energypluscompany.com	**R/C** **ACTIVE**
Energy.me Midwest LLC 90 Washington Blvd Bedminster, NJ 07921	(855)243-7270 www.energy.me	**R/C/I** **ACTIVE**
Ethical Electric Benefit Co. d/b/a Ethical Electric 100 Overlook Center, 2nd Fl. Princeton, NJ 08540	(888) 444-9452 www.ethicalelectric.com	**R/C** **ACTIVE**
FirstEnergy Solutions Corp. 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 www.fes.com	**C/I** **ACTIVE**
Gateway Energy Services Corporation 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com	**R/C/I** **ACTIVE**

GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, New Jersey 08819	(866) 999-8374 www.gdfsuezenergyresources.com	**C/I** **ACTIVE**
Glacial Energy of New Jersey, Inc. 75 Route 15 Building E Lafayette, NJ 07848	(888) 452-2425 www.glacialenergy.com	**C/I** **ACTIVE**
Green Mountain Energy Company 211 Carnegie Center Drive Princeton, NJ 08540	(866) 767-5818 www.greenmountain.com/commercial-home	**C/I** **ACTIVE**
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	**R/C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, New Jersey 07102	(973) 438-4380 www.idtenergy.com	**R/C** **ACTIVE**
Independence Energy Group, LLC 211 Carnegie Center Princeton, NJ 08540	(877) 235-6708 www.chooseindependence.com	**R/C** **ACTIVE**
Integrys Energy Services, Inc. 99 Wood Avenue, South Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrysenergy.com	**C/I** **ACTIVE**
Liberty Power Delaware, LLC 3000 Atrium Way, Suite 273 Mt. Laurel, NJ 08054	(866) 769-3799 www.libertypowercorp.com	**R/C/I** **ACTIVE**
Liberty Power Holdings, LLC 3000 Atrium Way, Suite 273 Mt. Laurel, NJ 08054	(866) 769-3799 www.libertypowercorp.com	**R/C/I** **ACTIVE**
Linde Energy Services 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.linde.com	**C/I** **ACTIVE**
NATGASCO, Inc. 532 Freeman St. Orange, NJ 07050	(973) 678-1800 x. 251 www.supremeenergyinc.com	**R/C** **ACTIVE**

NextEra Energy Services New Jersey, LLC 651 Jernee Mill Road Sayreville, New Jersey 08872	(877) 528-2890 Commercial (800) 882-1276 Residential www.nexteraenergyservices.com	**R/C/I** **ACTIVE**
NJ Gas & Electric 1 Bridge Plaza fl. 2 Fort Lee, New Jersey 07024	(866) 568-0290 www.NJGandE.com	**R/C/I** **ACTIVE**
Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th fl. Woodbridge, NJ 07095	(877) 273-6772 www.noblesolutions.com	**C/I** **ACTIVE**
North American Power and Gas, LLC 222 Ridgedale Ave. Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
Palmco Power NJ, LLC One Greentree Centre 10,000 Lincoln Drive East Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) ENERGY-9 (363-7499) www.pepco-services.com	**C/I** **ACTIVE**
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Public Power & Utility of New Jersey, LLC 157 Broad St., Suite 304 Red Bank, NJ 07701	(888) 354-4415 www.ppandu.com	**R/C/I** **ACTIVE**
Reliant Energy 211 Carnegie Center Princeton, NJ 08540	(877) 297-3795 (877) 297-3780 www.reliant.com/pjm	**R** **C/I** **ACTIVE**
ResCom Energy LLC 18C Wave Crest Ave. Winfield Park, NJ 07036	(888) 238-4041 http://rescomenergy.com	**R/C/I** **ACTIVE**
Respond Power LLC 10 Regency CT Lakewood, NJ 08701	(877) 973-7763 www.respondpower.com	**R/C/I** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54	(800) 266-6020	**C/I** **ACTIVE**

Folsom, NJ 08037	www.southjerseyenergy.com	
Sperian Energy Corp. 1200 Route 22 East, Suite 2000 Bridgewater, NJ 08807	(888) 682-8082	**R/C/I** **ACTIVE**
Starion Energy PA Inc. 101 Warburton Avenue Hawthorne, NJ 07506	(800) 600-3040 www.starionenergy.com	**R/C/I** **ACTIVE**
Stream Energy 309 Fellowship Road, Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	**R** **ACTIVE**
UGI Energy Services, Inc. **d/b/a GASMARK** 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 50 East Palisades Avenue Englewood, NJ 07631	(800) 388-3862 www.lowcostpower.com	**R/C/I** **ACTIVE**
Viridian Energy 2001 Route 46, Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	**R/C/I** **ACTIVE**
Xoom Energy New Jersey, LLC 744 Broad Street Newark, New Jersey 07102	(888) 997-8979 www.xoomenergy.com	**R/C/I** **ACTIVE**
YEP Energy 89 Headquarters Plaza North #1463 Morristown, NJ 07960	(855) 363-7736 www.yepenergyNJ.com	**R/C/I** **ACTIVE**
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	(855) 732-2493 www.thisisyourenergy.com	**R/C/I** **ACTIVE**

Back to main supplier information page

SOUTH JERSEY GAS SERVICE TERRITORY
Last Updated: 10/24/12

***CUSTOMER CLASS** - R – RESIDENTIAL C – COMMERCIAL I - INDUSTRIAL

Supplier	Telephone & Web Site	Customer Class
Alpha Gas and Electric, LLC 641 5th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	**R/C** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	201- 384-5552 www.astralenergyllc.com	**R/C/I** **ACTIVE**
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	**C/I** **ACTIVE**
Clearview Electric Inc. **d/b/a Clearview Gas** 1744 Lexington Ave. Pennsauken, NJ 08110	800-746-4720 www.clearviewenergy.com	**R/C** **ACTIVE**
Colonial Energy, Inc. 83 Harding Road Wyckoff, NJ 07481	845-429-3229 www.colonialgroupinc.com	**C/I** **ACTIVE**
Compass Energy Services, Inc. 1085 Morris Avenue, Suite 150 Union, NJ 07083	866-867-8328 908-638-6605 www.compassenergy.net	**C/I** **ACTIVE**
ConocoPhillips Company 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-646-4427 www.conocophillips.com	**C/I** **ACTIVE**
Consolidated Edison Solutions, Inc. Cherry Tree Corporate Center 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-665-0955 www.conedsolutions.com	**C/I** **ACTIVE**
Constellation NewEnergy-Gas Division, LLC 900A Lake Street, Suite 2 Ramsey, NJ 07466	(800) 900-1982 www.constellation.com	**C/I** **ACTIVE**

Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 www.directenergy.com	**C/I** **ACTIVE**
Direct Energy Services, LLP 120 Wood Avenue, Suite 611 Iselin, NJ 08830	866-547-2722 www.directenergy.com	**R/C/I** **INACTIVE**
Energy Plus Natural Gas LP 309 Fellowship Road, East Gate Center, Suite 200 Mt. Laurel, NJ 08054	(877) 866-9193 www.energypluscompany.com	**R/C** **ACTIVE**
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	800-805-8586 www.gesc.com	**R/C/I** **ACTIVE**
UGI Energy Services, Inc. **d/b/a GASMARK** 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergyservices.com	**C/I** **ACTIVE**
Glacial Energy of New Jersey, Inc. 75 Route 15 Building E Lafayette, NJ 07848	888-452-2425 www.glacialenergy.com	**C/I** **ACTIVE**
Global Energy Marketing, LLC 129 Wentz Avenue Springfield, NJ 07081	800-542-0778 www.globalp.com	**C/I** **ACTIVE**
Great Eastern Energy 116 Village Blvd., Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	**C/I** **ACTIVE**
Greenlight Energy 330 Hudson Street, Suite 4 Hoboken, NJ 07030	718-204-7467 www.greenlightenergy.us	**C** **ACTIVE**
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	**C/I** **ACTIVE**
Hess Small Business Services, LLC One Hess Plaza Woodbridge, NJ 07095	888-494-4377 www.hessenergy.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	**R/C** **ACTIVE**

IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	973-438-4380 www.idtenergy.com	**R/C** **ACTIVE**

Integrys Energy Services – Natural Gas, LLC 99 Wood Avenue South Suite #802 Iselin, NJ 08830	(800) 536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	800-927-9794 www.intelligentenergy.org	**R/C/I** **ACTIVE**
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	800-828-9427 www.metromediaenergy.com	**C** **ACTIVE**
MxEnergy, Inc. 900 Lake Street Ramsey, NJ 07446	800-758-4374 www.mxenergy.com	**R/C/I** **ACTIVE**
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	800-840-4GAS www.natgasco.com	**C** **ACTIVE**
New Jersey Gas & Electric 1 Bridge Plaza, Fl. 2 Fort Lee, NJ 07024	866-568-0290 www.NJGandE.com	**R/C** **ACTIVE**
North American Power & Gas, LLC d/b/a North American Power 197 Route 18 South Ste. 3000 East Brunswick, NJ 08816	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	800-363-7499 www.pepco-services.com	**C/I** **ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**

PPL EnergyPlus, LLC 811 Church Road - Office 105 Cherry Hill, NJ 08002	800-281-2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Shell Energy North America (US) L.P. 17 Denison Street, Room 101B Highland Park, NJ 08904	800-281-2824 www.shell.com/us/energy	**C/I** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	800-266-6020 www.southjerseyenergy.com	**C/I** **ACTIVE**
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	855-466-2842 www.spragueenergy.com	**C/I** **ACTIVE**
Stream Energy New Jersey, LLC 309 Fellowship Road Suite 200 Mt. Laurel, NJ 08054	(973) 494-8097 www.streamenergy.net	**R/C** **ACTIVE**
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	800- 557-1121 www.woodruffenergy.com	**R/C/I** **ACTIVE**
Woodruff Energy US LLC 73 Water Street, P.O. Box 777 Bridgeton, NJ 08302	856-455-1111 800-557-1121 www.woodruffenergy.com	**C/I** **ACTIVE**
Xoom Energy New Jersey, LLC 744 Broad Street Newark, NJ 07102	888-997-8979 www.xoomenergy.com	**R/C/I** **ACTIVE**
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	(855) 732-2493 www.thisisyourenergy.com	**R/C/I** **ACTIVE**

Back to main supplier information page

APPENDIX B

Equipment Inventory

CHA Project # 28484
Elmer Elementary School
THE PITTSGROVE TOWNSHIP SCHOOL DISTRICT

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.	Current year	Years Old	ASHRAE life expectancy
Boiler	1	H.B. Smith	28HE-S/W-06	N/A	HHW Boiler	1773 MBH input	Mechanical Room	School HHW Baseboard Heaters and Unit Vents	2005	16		2014	9	25
HHW Pump Motor	1	Marathon Electric	FVK 14STTDR5631BD	N/A	HHW Pump/Motor	2HP	Mechanical Room	School HHW Baseboard Heaters and Unit Vents	2000	6		2014	14	20
HHW Pump Motor	1	Marathon Electric	FVK 14STTDR5631BD	N/A	HHW Pump/Motor	2HP	Mechanical Room	School HHW Baseboard Heaters and Unit Vents	2000	6		2014	14	20
DHW Heater	1	Bradford White	M240S6DS-1NCWW	JK17219668	Electric DHW Heater	3.5 kW 40 gallon	Mechanical Room	School DHW	2004	10		2014	10	20
DHW Heater	1	Unknown	Unknown	Unknown	Electric DHW Heater	unknown	Electric Room	School DHW	2004	10		2014	10	20
Split Unit	21	Mitsubish	PUGH42AKB	Various	Split Unit	1-1.5 ton Cooling Capactiy SEER of 12.0	Condenser located on the outside ground and the evaporator on the classroom wall	16 for classrooms and one for the faculty lounge, four for the offices	2002	8		2014	12	20
Unit Vent	17	Nessbitt	Unknown	Unknown	Unit Vent	HHW Heating Coils and Small Capacity Fans	Condenser located on the outside ground and the evaporator on the classroom floor	16 for classrooms and one for the faculty lounge	1997	3		2014	17	20
Heat Pump	1	Fijitsu	ASU18RLF	56550	Split Unit Heat Pump	1.5 ton Cooling Capacity 17. 20MBH Heating Capacity	Condenser located on the outside ground and the evaporator on the room wall	Computer Lab	2002	8		2014	12	20
HV Unit	2	Unknown	Unknown	Unknown	Heating Ventilating Units	unknown	Gym	Gym	2000	6		2014	14	20

Energy Audit of Pittsgrove Township Schools - Elmer Elementary School
CHA Project No. 28484
Existing Lighting & Audit Input

Cost of Electricity: **$0.133** **$/kWh**
$7.13 **$/kW**

			EXISTING CONDITIONS									Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh			
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)		Retrofit control device	Notes
105LED	Room 1	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
LED-2	Room 2	Classroom	13	LED 2 lamp Tube	LED 2 L	16	0.21	SW	2600	541		C-OCC	
105LED	Room 5	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 6	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 7	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 8	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 9	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 10	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 11	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 12	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 13	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 14	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 15	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
105LED	Room 16	Classroom	24	W 32 F 1	F41LL	32	0.77	SW	2600	1,997		C-OCC	
169LED	Multipurpose Room	Gymnasium	14	SP 250 MH ROOF	MH250/1	295	4.13	SW	2600	10,738		NONE	
105LED	Stage	Gymnasium	8	W 32 F 1	F41LL	32	0.26	SW	2600	666		NONE	
142LED	Stage	Gymnasium	3	MH 100	MH100/1	128	0.38	SW	2600	998		NONE	
105LED	Stage Wall Lights	Gymnasium	2	W 32 F 1	F41LL	32	0.06	SW	2600	166		NONE	
50LED	Mechanical Room	Mechanical Room	3	W 32 W P 2 (ELE)	F42LL	60	0.18	SW	6240	1,123		NONE	
105LED	Mechanical Room Storage Area	Mechanical Room	3	W 32 F 1	F41LL	32	0.10	SW	6240	599		NONE	
7LED	Boys Room	Restroom	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.18	SW	3120	562		C-OCC	
7LED	Girls Room	Restroom	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.18	SW	3120	562		C-OCC	
18LED	Corridor	Hallway	16	T 32 R F 4 (ELE)	F44ILL	112	1.79	SW	6240	11,182		NONE	
105LED	Storage Room	Storage Area	3	W 32 F 1	F41LL	32	0.10	SW	1560	150		C-OCC	
18LED	Lobby	Hallway	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	6240	1,398		NONE	
46LED	Small Kitchen	Storage Area	2	W 32 C F 2 (ELE)	F42LL	60	0.12	SW	1560	187		C-OCC	
105LED	Copy Room	Storage Area	1	W 32 F 1	F41LL	32	0.03	SW	1560	50		C-OCC	
105LED	Secretary Office	Office	4	W 32 F 1	F41LL	32	0.13	SW	2600	333		OCC	
105LED	Principle Office	Office	6	W 32 F 1	F41LL	32	0.19	SW	2600	499		OCC	
105LED	Nurse Office	Office	6	W 32 F 1	F41LL	32	0.19	SW	2600	499		OCC	
105LED	Teacher Lounge	Office	6	W 32 F 1	F41LL	32	0.19	SW	2600	499		OCC	
							18.63			**56,710**			

APPENDIX C

ECM Calculations

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484

Rate of Discount (used for NPV) 3.0%

	Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
						Electric	Natural Gas	Fuel Oil
	$ 0.166	$/kWh blended		0.000420205	21,240	$ 24,248	$ 11,414	
	$ 0.133	$/kWh supply	145,934	0.000420205				
	$ 7.13	$/kW	68.8	0				
	$ 1.22	$/Therm	9,368	0.00533471				
Estimated	$ 7.50	$/kgals		0				
		$/Gal						

Elmer Elementary School

Recommend? Y or N		Item	Savings kW	Savings kWh	Savings therms	Savings No. 2 Oil gal	Savings Water kgal	Savings $	Cost	Simple Payback	Life Expectancy	Equivalent CO_2 (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings kW	Simple Projected Lifetime Savings kWh	Simple Projected Lifetime Savings therms	Simple Projected Lifetime Savings kgal/yr	Simple Projected Lifetime Savings $	ROI	NPV	IRR
Y	ECM-1	Add Insulation on Fiberglass Wall Panels	0.0	438	1,348	0	0	1,715	$ 23,000	13.4	30	7.4	$ -	N	13.4	0.0	13,141	40,455	0	$ 51,455	1.2	$10,618	6.2%
Y	ECM-2	Replace Boilers with Condensing Boilers	0.0	0	2,316	0	0	2,821	$ 115,543	41.0	25	12.4	$ 5,250	N	39.1	0.0	0	57,897	0	$ 70,519	(0.4)	($61,174)	-3.2%
Y	ECM-3	Install Programmable Thermostats on Split Units	0.2	2,253	0	0	0	313	$ 4,125	13.2	20	0.9	$ -	N	13.2	3.0	45,067	0	0	$ 7,742	0.9	$528	4.3%
N	ECM-4	Replace Electric DHW Heaters with Gas Fired Condensing DHW	7.0	4,786	(170)	0	0	1,028	$ 34,365	33.4	15	1.1	$ 100	N	33.3	105.0	71,789	(2,552)	0	$ 17,790	(0.5)	($21,993)	-8.6%
N	ECM-L1	Lighting Replacements / Upgrades	10.7	32,496	0	0	0	5,241	$ 48,440	9.2	15	13.7	$ 2,750	N	8.7	161.2	487,440	0	0	$ 94,705	1.0	$16,880	7.7%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	7,444	0	0	0	990	$ 5,643	5.7	15	3.1	$ 745	N	4.9	0.0	111,660	0	0	$ 18,536	2.3	$6,921	18.7%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	10.7	36,042	0	0	0	5,713	$ 54,083	9.5	15	15.1	$ 3,495	N	8.9	161.2	540,630	0	0	$ 103,535	0.9	$17,613	7.4%
		Total (Does Not Include ECM-L1 & ECM-L2)	**17.9**	**43,519**	**3,494**	**0**	**0**	**$ 11,590**	**$ 231,116**	**19.9**	**21.0**	**37**	**$ 8,845**		**19.18**	**269**	**670,627**	**95,800**	-	**$ 251,040**	**0.1**	($54,409)	**0.8%**
		Recommended Measures (highlighted green above)	**10.9**	**38,733**	**3,664**	**0**	**0**	**$ 10,562**	**$ 196,751**	**18.6**	**22.5**	**36**	**$ 8,745**	**0**	**17.80**	**164**	**598,838**	**98,352**	-	**$ 233,251**	**0.2**	($32,416)	**1.9%**
		% of Existing	**16%**	**27%**	**39%**	**0**	**0**																

	City:	Atlantic City, NJ					
	Occupied Hours/Week	48					
		Building	Auditorium	Gymnasium	Library	Classrooms	
Temp	Enthalpy h (Btu/lb)	Bin Hours	Operating Hours	Occupied Hours	Occupied Hours	Occupied Hours	Occupied Hours
102.5							
97.5	38.6	17	5	0	0	0	0
92.5	38.5	61	17	0	0	0	0
87.5	37.5	132	38	0	0	0	0
82.5	34.8	344	98	0	0	0	0
77.5	32.4	566	162	0	0	0	0
72.5	31.3	755	216	0	0	0	0
67.5	27.8	780	223	0	0	0	0
62.5	24.7	889	254	0	0	0	0
57.5	21.8	742	212	0	0	0	0
52.5	19.0	710	203	0	0	0	0
47.5	17.0	642	183	0	0	0	0
42.5	15.0	795	227	0	0	0	0
37.5	12.8	784	224	0	0	0	0
32.5	10.7	682	195	0	0	0	0
27.5	8.7	345	99	0	0	0	0
22.5	7.1	229	65	0	0	0	0
17.5	5.4	189	54	0	0	0	0
12.5	4.1	70	20	0	0	0	0
7.5	2.5	22	6	0	0	0	0
2.5	1.3	6	2	0	0	0	0
-2.5							
-7.5							

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

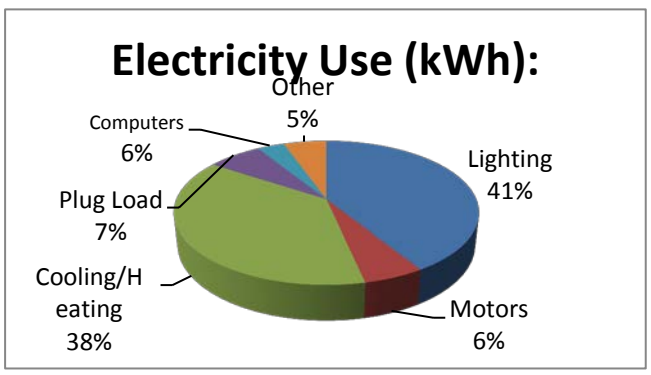
Heating System Efficiency	80%
Cooling Eff (kW/ton)	1.2

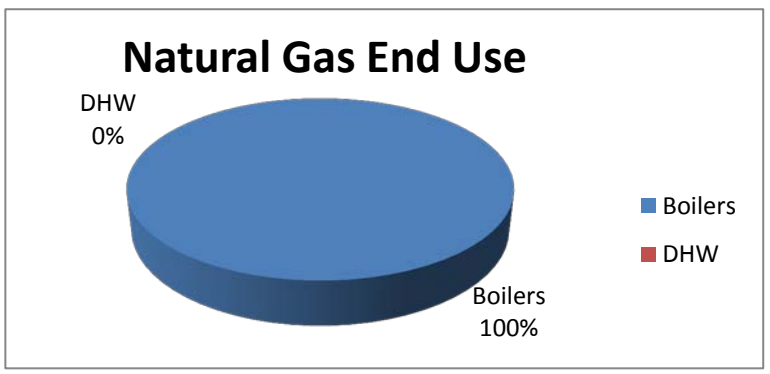
Heating		
Hours	4,474	Hrs
Weighted Avg	41	F
Avg	28	F

Cooling		
Hours	4,286	Hrs
Weighted Avg	67	F
Avg	78	F

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

Utility End Use Analysis			
Electricity Use (kWh):		**Notes/Comments:**	
145,934	Total	Based on utility analysis	
60,000	Lighting	From Lighting Calculations	41%
8,000	Motors	Estimated	5%
55,000	Cooling/Heating	Estimated	38%
10,000	Plug Load	Estimated	7%
5,000	Computers	Estimated	3%
7,934	Other	Remaining	5%
Natural Gas Use (Therms):		**Notes/Comments:**	
9,368	Total	Based on utility analysis	
9,368	Boilers	Therms/SF x Square Feet Served	100%
0	DHW	Based on utility analysis	0%





Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

Note: pricing is for energy calculations only -do not use for procurement

ECM-1 Add Insulation on Fiberglass Wall Panels

Existing: The building has fiberglass panels above the double pane panels. The panels are thinner than regular wall and do not have additional insulation layers on them. This can lead to increased energy consumption due to heat gain/loss.
Proposed: Add insulations on the fiberglass panels

Linear Feet of panel Edge	2,176.0 LF	Cooling System Efficiency	1.2 kW/ton	Heating System Efficiency	80%			
Area of Panel	2,176.0 SF	Ex Occupied Clng Temp.	72 *F	Heating On Temp.	60 *F			
Existing Infiltration Factor	**0.10 cfm/LF**	Ex Unoccupied Clng Temp.	76 *F	Ex Occupied Htg Temp.	72 *F			
Proposed Infiltration Factor	**0.10 cfm/LF**	Cooling Occ Enthalpy Setpoint	27.5 Btu/lb	Ex Unoccupied Htg Temp.	66 *F			
Existing U Value	**0.50 Btuh/SF/°F**	Cooling Unocc Enthalpy Setpoint	27.5 Btu/lb	Electricity	$ 0.166 $/kWh			
Proposed U Value	**0.20 Btuh/SF/°F**			Natural Gas	$ 1.22 $/therm			

				EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
				Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Panel Infiltration & Heat Load BTUH	Panel Infiltration & Heat Load BTUH	Panel Infiltration & Heat Load BTUH	Panel Infiltration & Heat Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Therms	Proposed Heating Energy Therms
A		B	C	D	E	F	G	H	I	J	K	L
102.5	50.1	0	0	0	-55,314	-50,962	-35,404	-33,663	0	0	0	0
97.5	42.5	6	2	4	-42,432	-38,080	-25,786	-24,045	24	15	0	0
92.5	39.5	45	16	29	-34,054	-29,702	-20,672	-18,931	141	88	0	0
87.5	36.6	146	52	94	-25,775	-21,423	-15,656	-13,916	336	212	0	0
82.5	34.0	298	106	192	-17,789	-13,437	-10,934	-9,194	447	293	0	0
77.5	31.6	476	170	306	-9,999	-5,647	-6,408	-4,668	343	252	0	0
72.5	29.2	662	237	426	-2,209	0	-1,882	0	52	45	0	0
67.5	27.0	740	264	476	0	0	0	0	0	0	0	0
62.5	24.5	765	273	492	0	0	0	0	0	0	0	0
57.5	21.4	733	262	471	19,184	11,246	9,718	5,697	0	0	129	65
52.5	18.7	668	239	430	25,799	17,861	13,069	9,048	0	0	173	88
47.5	16.2	659	235	424	32,414	24,476	16,420	12,399	0	0	225	114
42.5	14.4	685	245	441	39,029	31,091	19,771	15,750	0	0	291	147
37.5	12.6	739	264	475	45,644	37,706	23,122	19,101	0	0	375	190
32.5	10.7	717	256	461	52,259	44,321	26,473	22,452	0	0	423	214
27.5	8.6	543	194	349	58,874	50,936	29,824	25,803	0	0	365	185
22.5	6.8	318	114	205	65,489	57,551	33,175	29,154	0	0	240	122
17.5	5.5	245	88	158	72,104	64,166	36,526	32,505	0	0	205	104
12.5	4.1	156	56	100	78,719	70,781	39,877	35,856	0	0	144	73
7.5	2.6	92	33	59	85,334	77,396	43,228	39,207	0	0	92	47
2.5	1.0	36	13	23	91,949	84,011	46,579	42,558	0	0	39	20
-2.5	0.0	19	7	12	98,564	90,626	49,930	45,909	0	0	22	11
-7.5	-1.5	8	3	5	105,179	97,241	53,282	49,260	0	0	10	5
TOTALS		**8,760**	**3,129**	**5,631**					1342	904	**2,733**	**1,384**

Existing Panel Infiltration	**218**	**cfm**	
Existing Panel Heat Transfer	**1,088**	**Btuh/°F**	
Proposed Panel Infiltration	**218**	**cfm**	
Proposed Panel Heat Transfer	**435**	**Btuh/°F**	

Savings	**1,348**	**Therms**	**$**	**1,642**
	438	**kWh**	**$**	**73**
			$	**1,715**

Panel ID	Location	Quantity	Width (ft)	Height (ft)	Linear Feet (LF)	Area (SF)	Infiltration Rate (CFM/LF)	U Value (Btuh/SF/°F)	Infiltration (CFM)	Heat Transfer (Btuh/°F)
1	Whole Building	136	4	4	2176.0	2176.0	0.1	0.5	217.6	1088.0
Total		**136**	**4**	**4**	**2,176.0**	**2,176.0**	**0.10**	**0.50**	**217.6**	**1088.0**

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

ECM-1 Add Insulation on Fiberglass Wall Panels - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Add Insulation	2,176	sqft	$ 3	$ 5	$ -	$ 6,528	$ 10,880	$ -	$ 17,408	Internet pricing

Cost estimated are for Energy Savings only- do not use for procurement

$	17,408	Subtotal
$	1,741	10% Contingency
$	3,830	20% Contractor O&P
$	-	0% Engineering Fees
$	**23,000**	**Total**

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

ECM-2 Replace Boilers with Condensing Boilers

Description: This ECM evaluates the replacement of an existing boiler with high efficiency condensing gas boiler. The existing boiler efficiency is 80% (per NJBPU protocals) and the proposed boiler efficiency is 90% (average seasonal efficiency). Electrical power consumption due to pumps is considered to be the same for both the proposed system and the baseline system.

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 1.22	/ Therm	Natural Gas
Baseline Fuel Cost		/ Gal	No. 2 Oil
FORMULA CONSTANTS			
Oversize Factor	0.8		
Hours per Day	24		
Infrared Conversion Factor	1.0		1.0 if Boiler, 0.8 if Infrared Heater
EXISTING			
Capacity	1,773,000	btu/hr	Estimated Boiler Load % and Capacity
Heating Combustion Efficiency	80%		Estimated averaged Efficiency
Heating Degree-Day	2,792	Degree-day	
Design Temperature Difference	57	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	1,773,000	btu/hr	
Efficiency	90%		
SAVINGS			
Fuel Savings	2,316	therms	NJ Protocols Calculation
Fuel Cost Savings	$ 2,821		

Savings calculation formulas are taken from NJ Protocols document for Occupancy Controlled Thermostats

Algorithms

$$\textit{Gas Savings (Therms)} = \frac{OF \times ((CAPY_{Bi} \times EFF_Q) - (CAPY_{Qi} \times EFF_B \times ICF)) \times HDD_{mod} \times 24}{\Delta T \times HC_{fuel} \times EFF_B \times ICF \times EFF_Q}$$

Definition of Variables

OF = Oversize factor of standard boiler or furnace (OF=0.8)

$CAPY_{Bi}$ = Total input capacity of the baseline furnace, boiler or heater in Btu/hour

$CAPY_{Qi}$ = Total input capacity of the qualifying furnace, boiler or heater in Btu/hour

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

HC_{fuel} = Conversion from Btu to therms of gas or gallons of oil or propane (100,000 btu/therm; 138,700 btu/gal of #2 oil; 92,000 btu/gal of propane)

EFF_Q = Efficiency of qualifying heater(s) (AFUE %)

EFF_B = Efficiency of baseline heaters (AFUE %)

ICF = Infrared Compensation Factor (ICF = 0.8 for IR Heaters, 1.0 for furnaces/boilers)[2]

Furnaces and Boilers

Component	Type	Value	Source
$AFUE_q$	Variable		Application
$AFUE_b$	Fixed	Furnaces: 78% Boilers: 80% Infrared: 78%	EPACT Standard for furnaces and boilers
$CAPY_{in}$	Variable		Application
ΔT	Variable	See Table Below	1
HDD_{mod}	Fixed	See Table Below	1

Sources:

1. KEMA, *Smartstart Program Protocol Review*. 2009.
2. http://www.spaceray.com/1_space-ray_faqs.php

Adjusted Heating Degree Days by Building Type

Building Type	Heating Energy Density (kBtu/sf)	Degree Day Adjustment Factor	Atlantic City (HDD)	Newark (HDD)	Philadelphia (HDD)	Monticello (HDD)
Education	29.5	0.55	2792	2783	2655	3886
Food Sales	35.6	0.66	3369	3359	3204	4689
Food Service	39.0	0.73	3691	3680	3510	5137
Health Care	53.6	1.00	5073	5057	4824	7060
Lodging	15.0	0.28	1420	1415	1350	1976
Retail	29.3	0.55	2773	2764	2637	3859
Office	28.1	0.52	2660	2651	2529	3701
Public Assembly	33.8	0.63	3199	3189	3042	4452
Public Order/Safety	24.1	0.45	2281	2274	2169	3174
Religious Worship	29.1	0.54	2754	2745	2619	3833
Service	47.8	0.89	4524	4510	4302	6296
Warehouse/Storage	20.2	0.38	1912	1906	1818	2661

Heating Degree Days and Outdoor Design Temperature by Zone

Weather Station	HDD	Outdoor Design Temperature (F)
Atlantic City	5073	13
Newark	5057	14
Philadelphia, PA	4824	15
Monticello, NY	7060	8

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

ECM-2 Replace Boilers with Condensing Boilers - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
1,000 MBH NG Condensing Boiler	2	EA	$ 20,000	$ 10,000		$ 41,080	$ 24,920	$ -	$ 66,000	Vendor Estimate
Flue Installation	1	LS	$2,500.0	$2,500.00		$ 2,568	$ 3,115	$ -	$ 5,683	Vendor Estimate
controls	1	EA	$ 500.0	$1,500.00		$ 514	$ 1,869	$ -	$ 2,383	Estimated
Miscellaneous Electrical	1	LS	$ 1,000	$ 2,500		$ 1,027	$ 3,115	$ -	$ 4,142	Estimated
Miscellaneous HW Piping	1	LS	$ 2,000	$ 1,000		$ 2,054	$ 1,246	$ -	$ 3,300	Estimated
Pumps	2	EA	$ 3,500	$ 1,500		$ 7,189	$ 3,738	$ -	$ 10,927	Estimated
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

$ 92,434	Subtotal
$ 23,109	25% Contingency
$ 115,543	**Total**

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

ECM-3 Install Programmable Thermostats on Split Units

Description: This ECM evaluates adding automatic temperature controls that will turn the boilers on/off based on occupancy hours, outdoor air and indoor air temperatures.

Night Setback

EXISTING CONDITIONS			
Heating			
Heating Season Facility Temp		F	Th
Weekly Occupied Hours		hrs	H
Heating Season Setback Temp		F	Sh
Heating Season % Savings per	3%		Ph
Annual Boiler Capacity		Mbtu/yr	
Connected Heating Load		Btu/hr	Caph
Equivalent Full Load Heating	900	hrs	EFLHh
Heating Equipment Efficiency	80%		AFUEh
Cooling			
Cooling Season Facility Temp	70	F	Tc
Weekly Occupied Hours	48	hrs	H
Cooling Season Setback Temp	78	F	Sc
Cooling Season % Savings per	6%		Pc
Connected Cooling Load	15	Tons	Capc
Equivalent Full Load Cooling	381	hrs	EFLHc
Cooling Equipment EER	10.0		AFUEc
SAVINGS			
Natural Gas Savings	0	Therms[3]	
Cooling Electricity Savings	2,253	kWh	

$0.17	$/kWh Blended
$1.22	$/Therm

COMBINED SAVINGS		
Natural Gas Savings	0	Therms
Cooling Electricity Savings	2,253	kWh
Total Cost Savings	$ 374	
Estimated Total Project Cost	$ 4,125	
Simple Payback	11.0	Yrs

Savings calculation formulas are taken from NJ Protocols document for Occupancy Controlled Thermostats

Algorithms

Cooling Energy Savings (kWh) = (((T$_c$*(H+5)+S$_c$*(168-(H+5)))/168)
T$_c$)*(P$_c$*Cap$_{hp}$*12*EFLH$_c$/EER$_{hp}$)

Heating Energy Savings (kWh) = (((T$_h$*(H+5)+S$_h$*(168-(H+5)))/168)-
T$_h$)*(P$_h$*Cap$_{hp}$*12*EFLH$_h$/EER$_{hp}$)

Heating Energy Savings (Therms) = (T$_h$-(T$_h$*(H+5)+S$_h$*(168-
(H+5)))/168)*(P$_h$*Cap$_h$*EFLH$_h$/AFUE$_h$/100,000)

Definition of Variables

T$_h$ = Heating Season Facility Temp. (°F)
T$_c$ = Cooling Season Facility Temp. (°F)
S$_h$ = Heating Season Setback Temp. (°F)
S$_c$ = Cooling Season Setup Temp. (°F)
H = Weekly Occupied Hours
Cap$_{hp}$ = Connected load capacity of heat pump/AC (Tons) – Provided on Application.
Cap$_h$ = Connected heating load capacity (Btu/hr) – Provided on Application.
EFLH$_c$ = Equivalent full load cooling hours
EFLH$_h$ = Equivalent full load heating hours
P$_h$ = Heating season percent savings per degree setback
P$_c$ = Cooling season percent savings per degree setup
AFUE$_h$ = Heating equipment efficiency – Provided on Application.
EER$_{hp}$ = Heat pump/AC equipment efficiency – Provided on Application

Occupancy Controlled Thermostats

Component	Type	Value	Source
T$_h$	Variable		Application
T$_c$	Variable		Application
S$_h$	Fixed	T$_h$-5°	
S$_c$	Fixed	T$_c$+5°	
H	Variable		Application; Default of 56 hrs/week
Cap$_{hp}$	Variable		Application
Cap$_h$	Variable		Application
EFLH$_c$	Fixed	381	1
EFLH$_h$	Fixed	900	PSE&G
P$_h$	Fixed	3%	2
P$_c$	Fixed	6%	2
AFUE$_h$	Variable		Application
EER$_{hp}$	Variable		Application

Sources:
1. JCP&L metered data from 1995-1999
2. ENERGY STAR Products website

Pittsgrove Township School - Elmer Elementary School

CHA Project Numer: 28484

Elmer Elementary School

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-3 Install Programmable Thermostats on Split Units - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Programmable Thermostats	10	ea	$ 200	$ 100		$ 2,054	$ 1,246	$ -	$ 3,300	RS Means 2012
						$ -	$ -	$ -	$ -	

**Cost Estimates are for Energy Savings calculations only, do not use for procurement

$ 3,300	Subtotal
$ 825	25% Contingency
$ 4,125	**Total**

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

ECM-4 Replace Electric DHW Heaters with Gas Fired Condensing DHW Heaters

Description: This ECM evaluates the energy savings associated with replacing three electric tank type water heaters with high efficiency natural gas fired water heaters.

Item	Value	Units	Formula/Comments
Occupied days per week	5	days/wk	
Occupied weeks per year	52	week/yr	
Water supply Temperature	55	˚F	Termperature of water coming into building
Hot Water Temperature	120	˚F	
Hot Water Usage per day	66	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	9,326	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	80	Gallons	Per manufacturer nameplate
Hot Water Temperature	120	˚F	Per building personnel
Average Room Temperature	72	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.8	MBH	
Annual Standby Hot Water Load	7,008	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	16,334	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	100%		Per Manufacturer
Total Annual Energy Required	16,334	Mbtu/yr	
Total Annual Electric Required	**4,786**	**kWh/yr**	**Electrical Savings**
Average Annual Electric Demand	0.55	kW	
Peak Electric Demand	**7.00**	**kW**	Two 4.5 kW Heaters and one Heater has three elements (15kW each,it is assumed that one runs most of time)
New Tank Size	80	Gallons	
Hot Water Temperature	120	˚F	
Average Room Temperature	72	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.8	MBH	
Annual Standby Hot Water Load	7,008	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	16,334	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Navien CR180 instantaneous, condensing DHW Heater
Proposed Total Annual Energy Required	17,015	MBTU/yr	
Proposed Fuel Use	170	Therms/yr	Standby Losses and inefficient DHW heater eliminated
Elec Utility Demand Unit Cost	$7.13	$/kW	
Elec Utility Supply Unit Cost	$0.13	$/kWh	
NG Utility Unit Cost	$1.22	$/Therm	
Existing Operating Cost of DHW	$1,235	$/yr	
Proposed Operating Cost of DHW	$207	$/yr	
Annual Utility Cost Savings	**$1,028**	**$/yr**	

Daily Hot Water Demand

			#USES PER DAY		FULL TIME OCCUPANTS**				
FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	MALE	FEMALE	MALE	FEMALE	TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
LAVATORY	2.5	0.25	1	1	100	100	125	50%	63
SHOWER	2.5	5	0	0	0	0	0	75%	0
KITCHEN SINK	2.5	0.5	0	3	0	0	0	75%	0
MOP SINK	2.5	2	1	1	0	1	5	75%	4
Dishwasher (gal per use)	10	1	0	1	0	0	0	100%	0
						TOTAL	130		**66**

*GPM is per standard fixtures, adjust as necessary if actual GPM is known.
**These are the occupanct that use the fixtures. If fixture does not exist change to (0).

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

ECM-4 Replace Electric DHW Heaters with Gas Fired Condensing DHW Heaters - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
DHW Heater Removal	2	LS		$ 50		$ -	$ 125	$ -	$ 125	RS Means 2012
80 gallon High Efficiency Gas-Fired DHW Heater	1	EA	$ 5,500	$ 1,000		$ 5,649	$ 1,246	$ -	$ 6,895	From Internet Price/ Estimated Labor Cost*
Miscellaneous Electrical	1	LS	$ 300			$ 308	$ -	$ -	$ 308	RS Means 2012
Venting Kit	3	EA	$ 450	$ 650		$ 1,386	$ 2,430	$ -	$ 3,816	RS Means 2012
Miscellaneous Piping and Valves	1	LS	$ 5,000	$ 9,000		$ 5,135	$ 11,214	$ -	$ 16,349	Estimated

* Rheem SPIDEfire
**Cost Estimates are for Energy Savings calculations only, do not use for procurement

$ 27,492	Subtotal
$ 6,873	25% Contingency
$ 34,365	**Total**

Pittsgrove Township School - Elmer Elementary School
CHA Project Numer: 28484
Elmer Elementary School

New Jersey Pay For Performance Incentive Program

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per April, 2012.
Building must have a minimum average electric demand of 100 kW. This minimum is waived for buildings owned by local governements or non-profit organizations.
At a minimum, all recommended measures were used for this calculation. To qualify for P4P incentives, the following P4P requirements must be met:

- At least 15% source energy savings
- No more than 50% savings from lighting measures
- Scope includes more than one measure
- Project has at least a 10% internal rate of return
- At least 50% of the source energy savings must come from investor-owned electricity and/or natural gas (note: exemption for fuel conversions)

Total Building Area (Square Feet)	21,240
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilites (BPU)

Incentive #1		
Audit is funded by NJ BPU	$0.05	$/sqft

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$24,248	$11,414
Existing Usage (from utility)	145,934	9,368
Proposed Savings	38,733	3,664
Existing Total MMBtus	1,435	
Proposed Savings MMBtus	499	
% Energy Reduction	**34.8%**	
Proposed Annual Savings	$10,562	

	Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm
Incentive #2	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.11	$1.25
Incentive #3	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.11	$1.25

	Incentives $		
	Elec	Gas	Total
Incentive #1	$0	$0	$5,000
Incentive #2	$4,261	$4,580	$8,841
Incentive #3	$4,261	$4,580	$8,841
Total All Incentives	**$8,521**	**$9,161**	**$22,682**

Total Project Cost	$196,751

		Allowable Incentive
% Incentives #1 of Utility Cost*	14.0%	$5,000
% Incentives #2 of Project Cost**	4.5%	$8,841
% Incentives #3 of Project Cost**	4.5%	$8,841
Total Eligible Incentives***	**$22,682**	
Project Cost w/ Incentives	$174,068	

Project Payback (years)	
w/o Incentives	w/ Incentives
18.6	16.5

* Maximum allowable incentive is 50% of annual utility cost if not funded by NJ BPU, and %25 if it is.

** Maximum allowable amount of Incentive #2 is 25% of total project cost.
Maximum allowable amount of Incentive #3 is 25% of total project cost.

*** Maximum allowable amount of Incentive #1 is $50,000 if not funded by NJ BPU, and $25,000 if it is.
Maximum allowable amount of Incentive #2 & #3 is $1 million per gas account and $1 million per electric account; maximum 2 million per project

Energy Audit of Pittsgrove Township Schools - Elmer Elementary School
CHA Project No. 28484
ECM-L1 Lighting Replacements

		EXISTING CONDITIONS							RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
105LED	Room 1	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
LED-2	Room 2	13	LED 2 lamp Tube	LED 2 L	16	0.2	SW	2600	541	13	LED 2 lamp Tube	LED 2 L	16	0.2	SW	2,600	541	-	0.0	$ -	$ -	$0		#DIV/0!
105LED	Room 5	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 6	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 7	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 8	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 9	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 10	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 11	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 12	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 13	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 14	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 15	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
105LED	Room 16	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	SW	2,600	936	1,061	0.4	$ 175.99	$ 1,960.20	$0	11.1	11.1
169LED	Multipurpose Room	14	SP 250 MH ROOF	MH250/1	295	4.1	SW	2600	10,738	14	FXLED78	FXLED78/1	78	1.1	SW	2,600	2,839	7,899	3.0	$ 1,310.40	$ 11,818.74	$2,450	9.0	7.1
105LED	Stage	8	W 32 F 1	F41LL	32	0.3	SW	2600	666	8	4 ft LED Tube	200732x1	15	0.1	SW	2,600	312	354	0.1	$ 58.66	$ 653.40	$0	11.1	11.1
142LED	Stage	3	MH 100	MH100/1	128	0.4	SW	2600	998	3	FXLED39	FXLED39/1	39	0.1	SW	2,600	304	694	0.3	$ 115.17	$ 1,668.60	$300	14.5	11.9
105LED	Stage Wall Lights	2	W 32 F 1	F41LL	32	0.1	SW	2600	166	2	4 ft LED Tube	200732x1	15	0.0	SW	2,600	78	88	0.0	$ 14.67	$ 163.35	$0	11.1	11.1
50LED	Mechanical Room	3	W 32 W P 2 (ELE)	F42LL	60	0.2	SW	6240	1,123	3	4 ft LED Tube	200732x2	30	0.1	SW	6,240	562	562	0.1	$ 82.39	$ 490.05	$0	5.9	5.9
105LED	Mechanical Room Storage Area	3	W 32 F 1	F41LL	32	0.1	SW	6240	599	3	4 ft LED Tube	200732x1	15	0.0	SW	6,240	281	318	0.1	$ 46.69	$ 245.03	$0	5.2	5.2
7LED	Boys Room	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	3120	562	3	2T 25 R LED	2RTLED	25	0.1	SW	3,120	234	328	0.1	$ 52.55	$ 607.50	$0	11.6	11.6
7LED	Girls Room	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	3120	562	3	2T 25 R LED	2RTLED	25	0.1	SW	3,120	234	328	0.1	$ 52.55	$ 607.50	$0	11.6	11.6
18LED	Corridor	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	6240	11,182	16	T 50 R LED	RTLED50	50	0.8	SW	6,240	4,992	6,190	1.0	$ 908.13	$ 3,780.00	$0	4.2	4.2
105LED	Storage Room	3	W 32 F 1	F41LL	32	0.1	SW	1560	150	3	4 ft LED Tube	200732x1	15	0.0	SW	1,560	70	80	0.1	$ 14.94	$ 245.03	$0	16.4	16.4
18LED	Lobby	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	6240	1,398	2	T 50 R LED	RTLED50	50	0.1	SW	6,240	624	774	0.1	$ 113.52	$ 472.50	$0	4.2	4.2
46LED	Small Kitchen	2	W 32 C F 2 (ELE)	F42LL	60	0.1	SW	1560	187	2	4 ft LED Tube	200732x2	30	0.1	SW	1,560	94	94	0.1	$ 17.58	$ 326.70	$0	18.6	18.6
105LED	Copy Room	1	W 32 F 1	F41LL	32	0.0	SW	1560	50	1	4 ft LED Tube	200732x1	15	0.0	SW	1,560	23	27	0.0	$ 4.98	$ 81.68	$0	16.4	16.4
105LED	Secretary Office	4	W 32 F 1	F41LL	32	0.1	SW	2600	333	4	4 ft LED Tube	200732x1	15	0.1	SW	2,600	156	177	0.1	$ 29.33	$ 326.70	$0	11.1	11.1
105LED	Principle Office	6	W 32 F 1	F41LL	32	0.2	SW	2600	499	6	4 ft LED Tube	200732x1	15	0.1	SW	2,600	234	265	0.1	$ 44.00	$ 490.05	$0	11.1	11.1
105LED	Nurse Office	6	W 32 F 1	F41LL	32	0.2	SW	2600	499	6	4 ft LED Tube	200732x1	15	0.1	SW	2,600	234	265	0.1	$ 44.00	$ 490.05	$0	11.1	11.1
105LED	Teacher Lounge	6	W 32 F 1	F41LL	32	0.2	SW	2600	499	6	4 ft LED Tube	200732x1	15	0.1	SW	2,600	234	265	0.1	$ 44.00	$ 490.05	$0	11.1	11.1
	Total	**410**				**18.6**			**56,710**	**410**			**673**	**7.9**			**24,214**	**32,496**	**10.7**	**$5,241**	**$48,440**	**$2,750**		
																		Demand Savings		**10.7**	**$919**			
																		kWh Savings		**32,496**	**$4,322**			
																		Total savings			**$5,241**		**9.2**	**8.7**

Energy Audit of Pittsgrove Township Schools - Elmer Elementary School
CHA Project No. 28484
ECM-L2 Install Occupancy Sensors

		EXISTING CONDITIONS							RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	($/kWh) * (kW Saved)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
105LED	Room 1	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
LED-2	Room 2	13	LED 2 lamp Tube	LED 2 L	16	0.2	SW	2600	540.8	13	LED 2 lamp Tube	LED 2 L	16	0.2	C-OCC	1950	405.6	135.2	0.0	$17.98	$270.00	$35.00	15.0	13.1
105LED	Room 5	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 6	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 7	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 8	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 9	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 10	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 11	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 12	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 13	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 14	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 15	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
105LED	Room 16	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,996.8	24	W 32 F 1	F41LL	32	0.8	C-OCC	1950	1,497.6	499.2	0.0	$66.39	$270.00	$35.00	4.1	3.5
169LED	Multipurpose Room	14	SP 250 MH ROOF	MH250/1	295	4.1	SW	2600	10,738.0	14	SP 250 MH ROOF	MH250/1	295	4.1	NONE	2600	10,738.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
105LED	Stage	8	W 32 F 1	F41LL	32	0.3	SW	2600	665.6	8	W 32 F 1	F41LL	32	0.3	NONE	2600	665.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
142LED	Stage	3	MH 100	MH100/1	128	0.4	SW	2600	998.4	3	MH 100	MH100/1	128	0.4	NONE	2600	998.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
105LED	Stage Wall Lights	2	W 32 F 1	F41LL	32	0.1	SW	2600	166.4	2	W 32 F 1	F41LL	32	0.1	NONE	2600	166.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Mechanical Room	3	W 32 W P 2 (ELE)	F42LL	60	0.2	SW	6240	1,123.2	3	W 32 W P 2 (ELE)	F42LL	60	0.2	NONE	6240	1,123.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
105LED	Mechanical Room Storage Area	3	W 32 F 1	F41LL	32	0.1	SW	6240	599.0	3	W 32 F 1	F41LL	32	0.1	NONE	6240	599.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
7LED	Boys Room	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	3120	561.6	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	C-OCC	2184	393.1	168.5	0.0	$22.41	$270.00	$35.00	12.0	10.5
7LED	Girls Room	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	3120	561.6	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	C-OCC	2184	393.1	168.5	0.0	$22.41	$270.00	$35.00	12.0	10.5
18LED	Corridor	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	6240	11,182.1	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	NONE	6240	11,182.1	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
105LED	Storage Room	3	W 32 F 1	F41LL	32	0.1	SW	1560	149.8	3	W 32 F 1	F41LL	32	0.1	C-OCC	1092	104.8	44.9	0.0	$5.98	$270.00	$35.00	45.2	39.3
18LED	Lobby	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	6240	1,397.8	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	NONE	6240	1,397.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
46LED	Small Kitchen	2	W 32 C F 2 (ELE)	F42LL	60	0.1	SW	1560	187.2	2	W 32 C F 2 (ELE)	F42LL	60	0.1	C-OCC	1092	131.0	56.2	0.0	$7.47	$270.00	$35.00	36.1	31.5
105LED	Copy Room	1	W 32 F 1	F41LL	32	0.0	SW	1560	49.9	1	W 32 F 1	F41LL	32	0.0	C-OCC	1092	34.9	15.0	0.0	$1.99	$270.00	$35.00	135.6	118.0
105LED	Secretary Office	4	W 32 F 1	F41LL	32	0.1	SW	2600	332.8	4	W 32 F 1	F41LL	32	0.1	OCC	2080	266.2	66.6	0.0	$8.85	$128.25	$20.00	14.5	12.2
105LED	Principle Office	6	W 32 F 1	F41LL	32	0.2	SW	2600	499.2	6	W 32 F 1	F41LL	32	0.2	OCC	2080	399.4	99.8	0.0	$13.28	$128.25	$20.00	9.7	8.2
105LED	Nurse Office	6	W 32 F 1	F41LL	32	0.2	SW	2600	499.2	6	W 32 F 1	F41LL	32	0.2	OCC	2080	399.4	99.8	0.0	$13.28	$128.25	$20.00	9.7	8.2
105LED	Teacher Lounge	6	W 32 F 1	F41LL	32	0.2	SW	2600	499.2	6	W 32 F 1	F41LL	32	0.2	OCC	2080	399.4	99.8	0.0	$13.28	$128.25	$20.00	9.7	8.2
	Total	**410**				**18.6**			**56710.2**	**410.0**				**18.6**				**49266.3**	**7443.9**	**0.0**	**990.0**	**5643.0**	**745.0**		
																		Demand Savings			**0.0**	**$0**			
																		kWh Savings			**7,444**	**$990**			
																		Total Savings				**$990**		**5.7**	**4.9**

Energy Audit of Pittsgrove Township Schools - Elmer Elementary School
CHA Project No. 28484
ECM-L3 Lighting Replacements with Occupancy Sensors

		EXISTING CONDITIONS							RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
105LED	Room 1	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
LED-2	Room 2	13	LED 2 lamp Tube	LED 2 L	16	0.2	SW	2600	541	13	LED 2 lamp Tube	LED 2 L	16	0.2	C-OCC	1,950	406	135	0.0	$ 17.98	$ 270.00	$ 35	15.0	13.1
105LED	Room 5	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 6	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 7	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 8	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 9	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 10	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 11	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 12	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 13	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 14	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 15	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
105LED	Room 16	24	W 32 F 1	F41LL	32	0.8	SW	2600	1,997	24	4 ft LED Tube	200732x1	15	0.4	C-OCC	1,950	702	1,295	0.4	$ 207.11	$ 2,230.20	$ 35	10.8	10.6
169LED	Multipurpose Room	14	SP 250 MH ROOF	MH250/1	295	4.1	SW	2600	10,738	14	FXLED78	FXLED78/1	78	1.1	NONE	2,600	2,839	7,899	3.0	$ 1,310.40	$ 11,818.74	$ 2,450	9.0	7.1
105LED	Stage	8	W 32 F 1	F41LL	32	0.3	SW	2600	666	8	4 ft LED Tube	200732x1	15	0.1	NONE	2,600	312	354	0.1	$ 58.66	$ 653.40	$ -	11.1	11.1
142LED	Stage	3	MH 100	MH100/1	128	0.4	SW	2600	998	3	FXLED39	FXLED39/1	39	0.1	NONE	2,600	304	694	0.3	$ 115.17	$ 1,668.60	$ 300	14.5	11.9
105LED	Stage Wall Lights	2	W 32 F 1	F41LL	32	0.1	SW	2600	166	2	4 ft LED Tube	200732x1	15	0.0	NONE	2,600	78	88	0.0	$ 14.67	$ 163.35	$ -	11.1	11.1
50LED	Mechanical Room	3	W 32 W P 2 (ELE)	F42LL	60	0.2	SW	6240	1,123	3	4 ft LED Tube	200732x2	30	0.1	NONE	6,240	562	562	0.1	$ 82.39	$ 490.05	$ -	5.9	5.9
105LED	Mechanical Room Storage Area	3	W 32 F 1	F41LL	32	0.1	SW	6240	599	3	4 ft LED Tube	200732x1	15	0.0	NONE	6,240	281	318	0.1	$ 46.69	$ 245.03	$ -	5.2	5.2
7LED	Boys Room	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	3120	562	3	2T 25 R LED	2RTLED	25	0.1	C-OCC	2,184	164	398	0.1	$ 61.89	$ 877.50	$ 35	14.2	13.6
7LED	Girls Room	3	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.2	SW	3120	562	3	2T 25 R LED	2RTLED	25	0.1	C-OCC	2,184	164	398	0.1	$ 61.89	$ 877.50	$ 35	14.2	13.6
18LED	Corridor	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	6240	11,182	16	T 50 R LED	RTLED50	50	0.8	NONE	6,240	4,992	6,190	1.0	$ 908.13	$ 3,780.00	$ -	4.2	4.2
105LED	Storage Room	3	W 32 F 1	F41LL	32	0.1	SW	1560	150	3	4 ft LED Tube	200732x1	15	0.0	C-OCC	1,092	49	101	0.1	$ 17.74	$ 515.03	$ 35	29.0	27.1
18LED	Lobby	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	6240	1,398	2	T 50 R LED	RTLED50	50	0.1	NONE	6,240	624	774	0.1	$ 113.52	$ 472.50	$ -	4.2	4.2
46LED	Small Kitchen	2	W 32 C F 2 (ELE)	F42LL	60	0.1	SW	1560	187	2	4 ft LED Tube	200732x2	30	0.1	C-OCC	1,092	66	122	0.1	$ 21.32	$ 596.70	$ 35	28.0	26.4
105LED	Copy Room	1	W 32 F 1	F41LL	32	0.0	SW	1560	50	1	4 ft LED Tube	200732x1	15	0.0	C-OCC	1,092	16	34	0.0	$ 5.91	$ 351.68	$ 35	59.5	53.5
105LED	Secretary Office	4	W 32 F 1	F41LL	32	0.1	SW	2600	333	4	4 ft LED Tube	200732x1	15	0.1	OCC	2,080	125	208	0.1	$ 33.48	$ 454.95	$ 20	13.6	13.0
105LED	Principle Office	6	W 32 F 1	F41LL	32	0.2	SW	2600	499	6	4 ft LED Tube	200732x1	15	0.1	OCC	2,080	187	312	0.1	$ 50.22	$ 618.30	$ 20	12.3	11.9
105LED	Nurse Office	6	W 32 F 1	F41LL	32	0.2	SW	2600	499	6	4 ft LED Tube	200732x1	15	0.1	OCC	2,080	187	312	0.1	$ 50.22	$ 618.30	$ 20	12.3	11.9
105LED	Teacher Lounge	6	W 32 F 1	F41LL	32	0.2	SW	2600	499	6	4 ft LED Tube	200732x1	15	0.1	OCC	2,080	187	312	0.1	$ 50.22	$ 618.30	$ 20	12.3	11.9
S	**Total**	**410**				**18.6**			**56,710**	**410**				**7.9**				**20,668**	**10.7**	**5,713**	**54,083**	**$3,495**		
S																		**Demand Savings**		**10.7**	**$919**			
S																		**kWh Savings**		**36,042**	**$4,794**			
S																		**Total Savings**			**$5,713**		**9.5**	**8.9**

APPENDIX D

New Jersey Board of Public Utilities Incentives

i. **Smart Start**

ii. **Direct Install**

iii. **Pay for Performance (P4P)**

iv. **Energy Savings Improvement Plan (ESIP)**

I. SMART START

NJ SmartStart Buildings

Program Overview

With New Jersey SmartStart Buildings ...

... A smart start now means better performance later! Whether you're starting a commer industrial project from the ground up, renovating existing space, or upgrading equipmen unique opportunities to upgrade the energy efficiency of the project.

Special Notice

Enhanced incentives are available for NJ SmartStart Building upgrades in buildings im Hurricane Sandy. Eligible projects receive an additional 50% and new incentives have added for high efficiency food service equipment.

Visit the Sandy web page for details and important links.

New Jersey SmartStart Buildings can provide a range of support — at no cost to you — substantial energy savings, both now and for the future. Learn more about:

- Project Categories
- Custom Measures
- Incentives for Qualifying Equipment and Projects
- Program Terms and Conditions
- Find a Trade Ally

Please note: pre-approval is required for almost all energy efficiency incentives. T you must submit an application form (and applicable worksheets) and receive an approv from the program before any equipment is installed (click here for complete Terms and (Upon receipt of an approval letter, you may proceed to install the equipment listed on yc approved application. Equipment installed prior to the date of the approval letter is not e an incentive. **Any customer and/or agent who purchases equipment prior to the re incentive approval letter does so at his/her own risk.**

Getting Started

Submit your project application form as soon as you know you will be doing a constructi or replacing/adding equipment.

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

Apply for pre-approval by submitting an application for the type of equipment you have c install. The application should be accompanied by a related worksheet, where applicabl manufacturer's specification sheet (refer to the specific program requirements on the ba application for specs needed for your project) for the equipment you are planning to inst (Program representatives will review your application package and approve it, reject it, a advise you of upgrades in equipment that will save energy costs and/or increase your in

Support for Custom Energy-Efficiency Measures

Custom measures allows program participants the opportunity to receive an incentive fo energy-efficiency measures that are not on the prescriptive equipment Incentive list, but project/facility specific.

Incentives for Qualifying Equipment and Projects

Financial incentives are available for large and small projects. These incentives offset s maybe even all! — of the added cost to purchase qualifying energy-efficient equipment, provides significant long-term energy savings. Ranges of incentives are available for qu equipment (depending on type, size, and efficiency) in several categories.

Find out more about equipment incentives

For specific details on equipment requirements and financial incentives, including ince equipment not listed here, contact a program representative. Fiscal year financial incent be limited to a maximum of $500,000 per customer utility account and are available as f permits.

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COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

EQUIPMENT INCENTIVES

FOOD SERVICE EQUIPMENT

APPLICATION FORMS

TOOLS AND RESOURCES

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

Home » Commercial & Industrial » Programs » NJ SmartStart Buildings

Equipment Incentives

Special Notice

Enhanced incentives are available for NJ SmartStart Building upgrades in buildings im Hurricane Sandy. Eligible projects receive an additional 50% and new incentives have added for high efficiency food service equipment.

Visit the Sandy web page for details and important links.

More reasons for a smart start on your next project!

New Jersey SmartStart Buildings provides **financial incentives for qualifying equipment**. These incentives were developed to help our customers offset some of the added cost to purchase qualifying energy-efficient equipment, which provides significant long-term energy savings. A wide range of incentives are available for qualifying equipment (depending on type, size and efficiency).

Listed below are the types of qualifying equipment and ranges of incentives. For details on equipment requirements and full listings of incentives, refer to the **online application forms**.

Please note that almost all equipment incentives require pre-approval before equipment is installed. (**click for exceptions**)To start the pre-approval process, submit an Equipment Application, and appropriate Equipment Worksheets, for the type types of equipment you are planning to install along with equipment specification sheets (refer to the specific program requirements on the back of the application for specificatic needed for your project) and a current utility bill(s).

In order to be eligible to receive financial incentives under this Program, Applicants mus receive electric and/or gas service from one of the regulated electric and/or gas utilities the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

Electric Chillers

Water-cooled chillers ($12 - $170 per ton)
Air-cooled chillers ($8 - $52 per ton)

Gas Cooling

Gas absorption chillers ($185-$450 per ton)
Gas Engine-Driven Chillers (Calculated through Custom Measure F

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

Desiccant Systems ($1.00 per cfm - gas or electric)

Electric Unitary HVAC

Unitary AC and split systems ($73 - $92 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 Thermostats ($75 each)
A/C Economizing Controls ($85 - $170 each)

Ground Source Heat Pumps

Closed Loop ($450-750 per ton)

Gas Heating

Gas-fired boilers < 300 MBH ($300 per unit)
Gas-fired boilers ≥ 300 MBH - 1500 MBH ($1.75 per MBH)
Gas-fired boilers ≥ 1500 MBH - ≤ 4000 MBH ($1.00 per MBH)
Gas-fired boilers > 4000 MBH (Calculated through Custom Measur
Gas furnaces ($300-$400 per unit)
Gas infrared heaters - indoor only ($300 - $500 per unit)
Boiler economizing controls ($1,200 - $2,700 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)
Tankless water heaters replacing a free standing water heater > 82 energy factor ($300 per heater)
Gas-fired booster water heaters ($17 - $35 per MBH)

Premium Motors

Three-phase motors ($45 - $700 per motor) **(Incentive was discor effective March 1, 2013 except for buildings impacted by Hurri Sandy. Approved applications will have the standard timefram year from the program commitment date to complete the instal**

Refrigerator/Freezer Case Premium Efficiency Motors (ECM)

Fractional (< 1 HP) Electronic Commutated Motors (ECM) ($40 per for replacement of existing shaded-pole motor in refrigerated/freeze

Prescriptive Lighting

New Linear Fluorescent

- T-12, HID and Incandescent to T-5 and T-8 ($25 - $200 p fixture) **(Note: T12 replacements are only available for buildings impacted by Hurricane Sandy)**
- New Induction ($70 per replaced HID fixture)
- New LED
  - Screw-in/Plug-in ($10 - $20 per lamp)
  - Refrigerator/Freezer Case ($30 - $65 per fixture)
  - Outdoor pole/arm/wall-mounted luminaires ($100 - $175 p fixture)
  - Display case ($30 per case)
  - Shelf-mounted display and task ($15 per linear foot)
  - Wall-wash, desk, recessed ($20 - $35 per fixture)
  - Parking garage luminaires ($100 per fixture)
  - Track or Mono-Point directional ($50 per fixture)
  - Stairwell and Passageway luminaires ($40 per fixture)
  - High-Bay, Low-Bay ($150 per fixture)
  - Bollard ($50 per fixture)
  - luminaires for Ambient Lighting of Interior Commercial Spa *Linear panels ($50 per fixture)*
  - Fuel pump canopy ($100 per fixture)
  - LED retrofit kits (custom measures)
- New Pulse-Start Metal Hallide ($25 per fixture)
- Linear Fluorescent Retrofit ($10 - $20 per fixture)
- Induction Retrofit ($50 per retrofitted HID fixture)
- New Construction/Complete Renovation (performance-based)

Note: Incentives for T-12 to T-5 and T-8 lamps with electronic ballast in facilities ($10 per fixture, 1-4 lamps) and T-5/T-8 high bay fixtures ($16 - per fixture) were discontinued effective March 1, 2013 for T-12 retrofits replacements except for buildings impacted by Hurricane Sandy. Appr applications will have the standard timeframe of one year from the pro commitment date to complete the installation

Lighting Controls

- Occupancy Sensors
  - Wall mounted ($20 per control)
  - Remote mounted ($35 per control)
  - Daylight dimmers ($25 per fixture controlled, $50 per fixtu office applications only)
  - Occupancy controlled hi-low fluorescent controls ($25 per controlled)
- HID or Fluorescent Hi-Bay Controls
  - Occupancy hi-low ($35 per fixture controlled)
  - Daylight dimming ($45 per fixture controlled)

Refrigeration

- Covers and Doors
  - Energy-Efficient doors for open refrigerated doors/covers per door)
  - Aluminum Night Curtains for open refrigerated cases ($3.5 linear foot)
- Controls
  - Door Heater Control ($50 per control)
  - Electric Defrost Control ($50 per control)
  - Evaporator Fan Control ($75 per control)
  - Novelty Cooler Shutoff ($50 per control)

Food Service Equipment

Cooking
- Combination Electric Oven/Steamer ($1,000 per oven)
- Combination Gas Oven/Steamer ($750 per oven)
- Electric Convection Oven ($350 per oven)
- Gas Convection Oven ($500 per oven)
- Gas Rack Oven ($1,000 single, $2,000 double)
- Gas Conveyor Oven ($500 small deck, $750 large deck)
- Electric Fryer ($200 per vat)
- Gas Fryer ($749 per vat)
- Electric Large Vat Fryer ($200 per vat)
- Gas Large Vat Fryer ($500 per vat)
- Electric Griddle ($300 per griddle)
- Gas Griddle ($125 per griddle)
- Electric Steam Cooker ($1,250 per steamer)
- Gas Steam Cooker ($2,000 per steamer)

Holding
- Full Size Insulated Cabinets ($300 per cabinet)
- Three Quarter Size Insulated Cabinets ($250 per cabinet)
- Half Size Insulated Cabinets ($200 per cabinet)

Cooling
- Glass Door Refrigerators ($75 - $150 per unit)
- Solid Door Refrigerators ($50 - $200 per unit)
- Glass Door Freezers ($200 - $1,000 per unit)
- Solid Door Freezers ($100 - $600 per unit)
- Ice Machines ($50 - $500 per unit)

Cleaning
- Dishwashers ($400 - $1,500 per unit)

Other Equipment Incentives*

- Performance Lighting ($1.00 per watt per square foot below prograi incentive threshold, currently 5% more energy efficient than ASHR/ 2007 for New Construction only.)
- Custom electric and gas equipment incentives (not prescriptive)

*Equipment incentives are calculated based on type, efficiency, size, and ap and are evaluated on a case-by-case basis. Contact us for details.

II. DIRECT INSTALL

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

PARTICIPATION STEPS

PARTICIPATING CONTRACTORS

SUSTAINABLE JERSEY

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

Direct Install

NEW JERSEY'S CLEAN ENERGY PROGRAM
DIRECT Install

Let us pay up to 70% of your energy efficiency upgrade.

Sometimes, the biggest challenge to improving energy efficiency is knowing where t and how to get through the process. Created specifically for existing small to mediun facilities, Direct Install is a turnkey solution that makes it easy and affordable to upgr high efficiency equipment. Direct Install is designed to cut your facility's energy costs replacing lighting, HVAC and other outdated operational equipment with energy effic alternatives. The program pays up to 70% of retrofit costs, dramatically improving yo payback on the project. There is a $125,000 incentive cap on each project.

ELIGIBILITY

Existing small to mid-sized commercial and industrial f with a peak electric demand that did not exceed 200 k any of the preceding 12 months are eligible to participa Direct Install. Applicants will submit the last 12 months electric utility bills indicating that they are below the de threshold and have occupied the building during that ti Buildings must be located in New Jersey and served b the state's public, regulated electric or natural gas utilit companies.

SYSTEMS & EQUIPMENT ADDRESSED BY THE PROGRAM

- Lighting
- Heating, Cooling & Ventilation (HVAC)
- Refrigeration
- Motors
- Natural Gas
- Variable Frequency Drives

Measures eligible for Direct Install are limited to specific equipment categories, type capacities. Boilers may not exceed 500,000 Btuh and furnaces may not exceed 140,

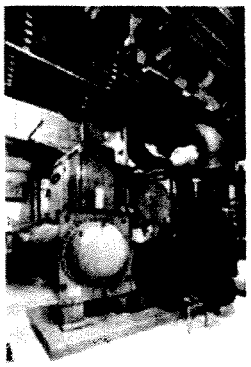
III. PAY FOR PERFORMANCE (P4P)

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

Take a comprehensive, whole-building approach to saving energy in your existing facilit earn incentives that are directly linked to your savings. Pay for Performance relies on a program partners who provide technical services under direct you. Acting as your energy expert, your partner will develop a reduction plan for each project with a whole-building technica component of a traditional energy audit, a financial plan for fu energy efficient measures and a construction schedule for ins



Eligibility

Existing commercial, industrial and institutional buildings with demand over 100 kW for any of the preceding twelve months to participate including hotels and casinos, large office buildir family buildings, supermarkets, manufacturing facilities, scho shopping malls and restaurants. Buildings that fall into the fol customer classes are not required to meet the 100 kW dema to participate in the program: hospitals, public colleges and universities, 501(c)(3) non-p affordable multifamily housing, and local governmental entities. Your energy reduction p define a comprehensive package of measures capable of reducing the existing energy consumption of your building by 15% or more.

Exceptions to the 15% threshold requirement may be made for certain industrial, manuf water treatment and datacenter building types whose annual energy consumption is hea weighted on process loads. Details are available in the high energy intensity section of t page.

ENERGY STAR Portfolio Manager

Pay for Performance takes advantage of the ENERGY STAR Program with Portfolio Manager, EPA's interactive tool that allows facility managers to track and evaluate energy and water consumption across all of their buildings. The tool provides the opportunity to load in the characteristics and energy usage of your buildings and determine an energy performance benchmark score. You can then assess energy management goals over time, identify strategic opportunities for savings, and receive EPA recognition for superior energy performance.

This rating system assesses building performance by tracking and scoring energy use ir facilities and comparing it to similar buildings. That can be a big help in locating opportu cost-justified energy efficiency upgrades. And, based on our findings, you may be invite participate in the Building Performance with ENERGY STAR initiative and receive speci recognition as an industry leader in energy efficiency.

Incentives

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

PAST PROGRAMS

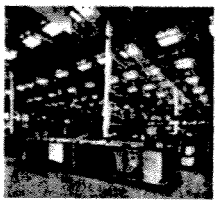
TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

Pay for Performance incentives are awarded upon the satisfactory completion of three p milestones:

Incentive #1 - Submittal of complete energy reduction plan prepared by an app program partner - Contingent on moving forward, incentives will be between $5 $50,000 based on approximately $.10 per square foot, not to exceed 50% of th annual energy expense.



Incentive #2 - Installation of recommended measures - Incentives are based on the projected level of electricity and natural gas savings resulting from the installation of comprehensive energy-efficiency measures.

Incentive #3 - Completion of Post-Construction Benchmarking Report - A completed report verifying energy reductions based on one year of post-implementation results. Incentives for electricity and natural gas savings will be based on actual savings, provided that the minimum performance threshold of savings has been achieved.

A detailed Incentive Structure document is available on the applications and form

Steps to Participation

Click here for a step-by-step description of the program.

Home | Residential | Commercial & Industrial | Renewable Energy
About Us | Press Room | Library | FAQs | Calendar | Newsletters | Contact Us | Site

New Jersey's Clean Energy PROGRAM
Your Power to Save
njcleanenergy.com

BPU

PAY FOR PERFORMANCE APPLICATION FORM

July 1, 2013 - June 30, 2014

Utility Serving Applicant: ☐ Atlantic City Electric ☐ Jersey Central Power & Light ☐ PSE&G
☐ New Jersey Natural Gas ☐ Elizabethtown Gas ☐ Rockland Electric Co. ☐ South Jersey Gas
☐ Other Electric Service Provider (please specify): _____
☐ Other Fuel Provider: _____ ☐ Oil: _____ ☐ Other (Please specify): _____

Instructions

1. Read the program material to determine project qualification.
2. Read the Participation Agreement and sign where indicated.
3. Fill out all applicable spaces on this form.
4. Provide a copy of the customer's company W-9 form.
5. Provide the most recent consecutive 12 month period of utility bills for the project.
6. Provide brief description of facility.
7. Partner must submit the application package via e-mail, mail or fax DIRECTLY to the Market Manager – see back of this form.

Approval of this Application is not an approval of the project's scope of work. Scope of work is only approved upon approval of the Energy Reduction Plan. See application and program guidelines for more information.

Customer/Owner Information (payment will be made to entity entered here)

Company Name		Project Contact/Title	
Company Address	City	State	Zip
Phone/Fax	E-mail	Federal ID/SSN	

Partner Information

Company Name		Project Contact/Title	
Company Address	City	State	Zip
Phone	Fax	E-mail	

Project Information

Project Name			
Building Address	City	State	Zip
Utility Account Number(s): Electric		Gas	
* Note: Please use the back of this page for additional utility accounts if quantity exceeds space allotment.			
Annual Peak kW Demand	Building Type		Number of Buildings
Size of Building(s) (gross sq/ft)	Direct, Master or Sub Metered		

Funding

❑ Check the box if an Energy Savings Improvement Program (ESIP) will be a source of funding. ESIP allows government agencies to pay for energy related improvements using the value of the resulting energy savings.

Do you expect to receive funding under any other efficiency programs? ☐ No ☐ Yes If Yes, please specify below:

Utility Program #1 – Utility: _____ Program Name: _____
Utility Program #2 – Utility: _____ Program Name: _____
Federal Program #1 – Organization: _____ Program Name: _____
Federal Program #2 – Organization: _____ Program Name: _____
Other Program – Organization: _____ Program Name: _____

Additional Project information

Additional Utility Account(s)

Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number

Additional Comments:

Complete this application form and send it directly to the Commercial/Industrial Market Manager by e-mail, mail or fax.

New Jersey's Clean Energy Program
c/o TRC Energy Services-P4P
900 Route 9 North, Suite 404 • Woodbridge, NJ 07095

Phone: 866-657-6278 • Fax: 732-855-0422
E-mail: P4P@NJCleanEnergy.com

Visit our website: NJCleanEnergy.com/P4P

*Incentives/Requirements subject to change.

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

Design Incentives – Incentives that may be offered to design professionals by the Program.

Design Services – Services that may be offered to design professionals under the Program.

Energy-Efficient Measures – Any device eligible to receive a Program Incentive payment through the NJ Clean Energy Commercial and Industrial Program (New Jersey SmartStart Buildings).

New Jersey Utilities – The regulated electric and/or gas utilities in the State of New Jersey. They are: Atlantic City Electric, Jersey Central Power & Light, Rockland Electric Company, New Jersey Natural Gas, Elizabethtown Gas, PSE&G, and South Jersey Gas.

Administrator – New Jersey Board of Public Utilities, Office of Clean Energy

Participating Customers – Those non-residential electric and/or gas service customers of the New Jersey Utilities who participate in this Program.

Product Installation or Equipment Installation – Installation of the Energy-Efficient Measures.

Projects with a contract threshold of $14,187 (increasing to $15,444 effective July 1, 2014) are required to pay no less than prevailing wage rate to workers employed in the performance of any construction undertaken in connection with Board of Public Utilities financial assistance, or undertaken to fulfill any condition of receiving Board of Public Utilities financial assistance, including the performance of any contract to construct, renovate or otherwise prepare a facility, the operations of which are necessary for the receipt of Board of Public Utilities financial assistance. By submitting an application, or accepting program incentives, applicant agrees to adhere to New Jersey Prevailing Wage requirements, as applicable.

Program – The Commercial and Industrial Energy-Efficient Construction Program (New Jersey SmartStart Buildings) offered herein by the New Jersey Board of Public Utilities, Office of Clean Energy pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq.

Program Incentives – Refers to the amount or level of incentive that the Program provides to Participating Customers pursuant to the Program offered herein (see description under "Incentive Amount" heading).

Program Offer – Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities identified above.

Program Manager – TRC Energy Services.

Application and Eligibility Process – The Program pays incentives after the installation of qualified energy-efficient measures that were pre-approved (for exceptions to this condition, please refer to "Exceptions for Approval".) In order to be eligible for Program Incentives, a Customer, or an agent (contractor/vendor) authorized by a Customer, must submit a properly completed application package. The package must include an application signed by the customer; a complete (current) utility bill; and technology worksheet and manufacturer's cut sheets (where appropriate). This information must be submitted to the Program Manager before equipment is installed. Applications for measures that are self installed by customers must be submitted by the customer and not the sales vendor of the measure, however, the customer may elect to assign payment of the incentive to the sales vendor. This application package must be received by the Program Manager on or before June 30, 2014 in order to be eligible for the fiscal year July 1, 2013-June 30, 2014 incentives. The Program Manager will review the application package to determine if the project is eligible for a Program Incentive. If eligible, the Customer will receive an approval letter with the estimated authorized incentive amount and the date by which the equipment must be installed in order for the approval to remain in effect. Upon receipt of an approval letter, the Customer may then proceed to install the equipment listed on the approved application. Equipment installed prior to the date of the Program Manager's approval letter is not eligible for an incentive. The Program Manager reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the approval letter. All equipment must be purchased within 12 months of date of application. **Any Customer and/ or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Exceptions for Approval – The Application and Eligibility Process pertains to all projects except for those involving either Gas Heating, Unitary HVAC or Motors having an incentive amount less than $5,000 that were installed within 12 months of receipt of the application. These measures, at this incentive level, may be installed without prior approval. In addition, but at the sole discretion of the Program Manager, emergency replacement of equipment may not require a prior approval determination and letter. **In such cases, please notify the Program Manager of such emergencies as early as possible, that an application will soon be sent in that was not pre-approved.**

Post-Installation Approval – After installation is completed, the Customer, or an agent authorized by the Customer, must finalize and submit an invoice for the purchase of the equipment (material cost must be broken out from labor costs), and any other required documentation as specified on the equipment application or in the Program Manager's initial approval letter.

Please refer to the program guide on the NJCleanEnergy.com/ssb website for the complete Application and Eligibility Process.

The Program Manager reserves the right to verify sales transactions and to have reasonable access to Participating Customer's facility to inspect both pre-existing product or equipment (if applicable) and the Energy-Efficient Measures

installed under this Program, either prior to issuing incentives or at a later time.

Energy-Efficient Measures must be installed in buildings located within a New Jersey Utilities' service territory and designated on the Participating Customer's incentive application. Program Incentives are available for qualified Energy-Efficient Measures as listed and described in the Program materials and incentive applications. The Participating Customer must ultimately own the equipment, either through an up-front purchase or at the end of a short-term lease. Design Incentives are available to design professionals as described in the Program materials and applications. A different and separate agreement must be executed by participating design professionals to be eligible for this type of incentive. The design professional does not need to be based in New Jersey.

Equipment procured by Participating Customers through another program offered by New Jersey's Clean Energy Program or the New Jersey Utilities, as applicable, is not eligible for incentives through this program. Customers who have not contributed to the Societal Benefits Charge of the applicable New Jersey Utility are not be eligible for incentives offered through this program.

Incentive Amount – Program Incentives will equal either: a) the approved Program Incentive amount, or b) the actual equipment cost of the Energy-Efficient Measure, whichever is less, as determined by the Program Manager. Products offered at no direct cost to the customer are ineligible. Incomplete application submissions, applications requiring inspections and unanticipated high volume of activities may cause processing delays. Program Incentives are limited to $500,000 per utility account in a calendar year. Contact the Program Manager regarding any questions.

Tax Liability – The Program Manager will not be responsible for any tax liability that may be imposed on any Participating Customer as a result of the payment of Program Incentives. All Participating Customers must supply their federal tax identification number or social security number to the Program Manager on the application form in order to receive a Program Incentive. In addition, Participating Customers must also provide a Tax Clearance Form (entitled "Business Assistance or Incentive Clearance Certificate") that is dated within 90 days of equipment installation.

Endorsement – The Program Manager and Administrator do not endorse, support or recommend any particular manufacturer, product or system design in promoting this Program.

Warranties – THE PROGRAM MANAGER AND ADMINISTRATOR DO NOT WARRANT THE PERFORMANCE OF INSTALLED EQUIPMENT, AND/OR SERVICES RENDERED AS PART OF THIS PROGRAM, EITHER EXPRESSLY OR IMPLICITLY. NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING EQUIPMENT OR SERVICES PROVIDED BY A MANUFACTURER OR VENDOR. CONTACT YOUR VENDOR/SERVICES PROVIDER FOR DETAILS REGARDING PERFORMANCE AND WARRANTIES.

Limitation of Liability – By virtue of participating in this Program, Participating Customers agree to waive any and all claims or damages against the Program Manager or the Administrator, except the receipt of the Program Incentive. Participating Customers agree that the Program Manager's and Administrator's liability, in connection with this Program, is limited to paying the Program Incentive specified. Under no circumstances shall the Program Manager, its representatives, or subcontractors, or the Administrator, be liable for any lost profits, special, punitive, consequential or incidental damages or for any other damages or claims connected with or resulting from participation in this Program. Further, any liability attributed to the Program Manager under this Program shall be individual, and not joint and/or several.

Assignment – The Participating Customer may assign Program Incentive payments to a specified vendor.

Participating Customer's Certification – Participating Customer certifies that he/she purchased and installed the equipment listed in their application at their defined New Jersey location. Participating Customer agrees that all information is true and that he/she has conformed to all of the Program and equipment requirements listed in the application.

Termination – The New Jersey Board of Public Utilities reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this Program without prior or further notice.

Acknowledgement – I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Program Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the NJ SmartStart Buildings Program. Additionally, I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of New Jersey's Clean Energy Program.

CUSTOMER'S SIGNATURE
PARTNER SIGNATURE
By signing, I certify that I have read, understand and agree to the Participation Agreement listed above.

IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

Home » Commercial & Industrial » Programs

Energy Savings Improvement Program

A new State law allows government agencies to make energy related improvements to t facilities and pay for the costs using the value of energy savings that result from the imp Under Chapter 4 of the Laws of 2009 (the law), the "Energy Savings Improvement Program" (ESIP), provides all government agencies in New Jersey with a flexible tool to and reduce energy usage with minimal expenditure of new financial resources.

This Local Finance Notice outlines how local governments can develop and implement a their facilities. Below are two sample RFPs:

Local Government
School Districts (K-12)

All RFPs must be submitted to the Board for approval at ESIP@bpu.state.nj.us.

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings
Procedures for Implementation

The ESIP approach may not be appropriate for all energy conservation and energy effic improvements. Local units should carefully consider all alternatives to develop an appro best meets their needs. Local units considering an ESIP should carefully review the Loc Notice, the law, and consult with qualified professionals to determine how they should a task.

The NJ Board of Public Utilities sponsored Sustainable Jersey in the creation of an ESIF Guidebook that explains how to implement the program. The guidebook also includes ca of successful projects and a list of helpful resources.

FIRST STEP – ENERGY AUDIT

For local governments interested in pursuing an ESIP, the first step is to perform an ene as prescribed in P.L.2012 c.55.

ENERGY REDUCTION PLANS

If you have an ESIP plan that needs to be submitted to the Board of Public Utilities, plea to ESIP@bpu.state.nj.us. Please limit the file size to 3MB (or break it into smaller files).

Frankford Township School District
Northern Hunterdon-Voorhees Regional High School
Manalapan Township *(**180 MB** - Right Click, Save As)*

ESIP PROGRAM

Final version 42413

BPU RULES

1. Public Entity must decide if they will use an ESCO or DIY method or Hybrid thereof prior to issuing the RFP and the RFP must state the intended method. A change in the project procurement model after the RFP closing date will be cause for immediate rejection and disqualification of potential Clean Energy program incentives.

2. RFP procedures shall be adhered to as per the legislation, including the use of BPU approved forms. Any alteration of the forms, without prior approval from the BPU shall be grounds for rejection.

3. RFP must include copy of an audit (ASHRAE Level II w/Level III for lighting) and audit must be prepared by a firm classified by DPMC in the 036 discipline.

4. All firms, including professional services, whether using ESCO or DIY model, must be DPMC classified.

5. If an Architect is engaged by the public entity, the architectural fees are the responsibility of the public entity and must be paid directly to the firm. These fees may be included in the energy cost savings analysis and payback.

   ESCO's may contract directly with an architectural firm, in which case the architectural firm serves as a subcontractor to the ESCO and the project related service costs may be included within the project's economic model.

6. Public entity shall conduct pre-bid meetings and site visits per existing statutes.

   In the interest of open public bidding transparency, it is a requirement of the BPU that all proposers must attend the pre-proposal bid meeting.

7. There shall be no negative cash flow in any year of the program.
   section 7 (1)(a)
   > "the energy savings resulting from the program will be sufficient to cover the cost of the program's energy conservation measures."

8. SREC values are not permitted to be used in the energy cost savings calculations.

9. Capital cost avoidance values are not to be used in the energy savings calculations.

10. Operational and Maintenance (O&M) cost savings may be permitted in the cost savings calculations, but only with supporting documentation.

11. Blended utility rates shall not be permitted. Use the actual utility tariff or local contracted rates if there is a third party supplier.

    For the RFP proposals, the public entity shall define the utility rates in the RFP

12. Contracted third party utility rates may only be used for the term of the contract (5 yr. maximum) Subsequent years are to be projected at the utility tariff rates plus the annual BPU escalation rates.

13. Public entity shall conduct M&V (measurement and verification) at the one (1) year operational date and shall provide a copy of the M&V report to the Board of Public Utilities.

    For the RFP proposals, the ESCO shall provide the cost for the one (1) year M&V only. For comparative purposes, the one year M&V pricing shall be indicated on the proposal Form VI, under the "Annual Service Costs" column. Additional M&V costs are at the discretion of the local unit and are not to be included in the proposal.

14. The decisions made by BPU staff regarding compliance or other issues that arise in connection with the RFP procurement process shall be considered a final decision of the BPU. Any appeal will need to be through the New Jersey Superior Court, Appellate Division.

15. For the RFP proposals only, Demand Response (DR) revenues claimed by ESCO's can only be projected for a maximum period of three (3) years. DR revenue projections beyond three years will not be permitted. DR revenues must be included and presented under the "Energy Rebates/Incentives" column of FORM VI.

16. ESCO "fees" proposed during the RFP phase of the project cannot increase post-award. ESCO's are required to maintain the fee percentages through final contract negotiations and construction of the Board approved Energy Savings Plan

17. Public Bid openings shall be held on the due date of the proposal submissions. The public entity shall announce the name of the bidder and the total dollar amount. After award of a contract, all proposals received will be made available by the owner for public inspection

18. Rejection of bids by the public entity shall be conducted in accordance with the appropriate sections of the applicable legislation, as stated in Title 40A:11-13.2. Additionally all proposals must be returned to the respective ESCO's upon rejection.

19. Field changes that exceed 5% of the project cost require BPU approval.

20. Energy Savings Plans (ESP) that is dependent upon incentives from the Clean Energy Program must review the current program requirements, at the time of application, for each incentive to insure eligibility. If any program incentive is denied, resubmission of all ESIP related forms will be necessary to remain ESIP qualified.

APPENDIX E

Photovoltaic Analysis

Elmer Elementary School

Preliminary Screening
Solar PV

Cost of Electricity	$0.171	/kWh
Electricity Usage	76,356	kWh/yr
System Unit Cost	$4,000.000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$280,000	**70.0**	**113,664**	**0**	**$19,437**	**0**	**$19,437**	**$0**	**$19,891**	**14.4**	**7.1**

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= $175 /1000kwh

Area Output*

m2
0 ft2

Perimeter Output*

m
0 ft

Available Roof Space for PV:
(Area Output - 10 ft x Perimeter) x 85%
0 ft2

Approximate System Size:

11	watt/ft2	
91	DC watts	
70	kW	Enter into PV Watts

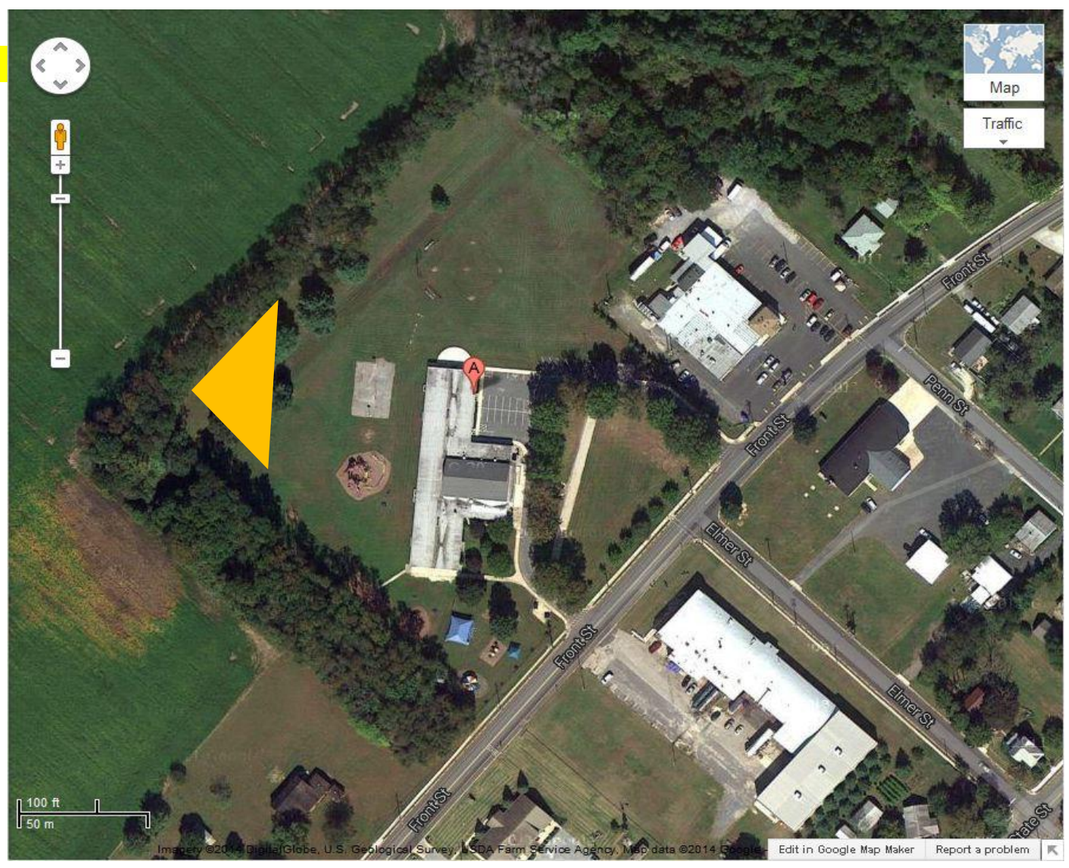
PV Watts Inputs***

Array Tilt Angle	40	
Array Azimuth	170	Enter into PV Watts (default)
Zip Code	08318	Enter into PV Watts
DC/AC Derate Factor	0.77	Enter info PV Watts

PV Watts Output
113,664 annual kWh calculated in PV Watts program

% Offset Calc

Usage	76,356	(from utilities)
PV Generation	113,664	(generated using PV Watts)
% offset	149%	



* http://www.freemaptools.com/area-calculator.htm
** http://www.flettexchange.com
*** http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html

AC Energy & Cost Savings

Cautions for Interpreting the Results

(Type comments here to appear on printout; maximum 1 row of 80 characters.)

Station Identification	
City:	Atlantic_City
State:	New_Jersey
Latitude:	39.45° N
Longitude:	74.57° W
Elevation:	20 m
PV System Specifications	
DC Rating:	91.0 kW
DC to AC Derate Factor:	0.770
AC Rating:	70.1 kW
Array Type:	Fixed Tilt
Array Tilt:	40.0°
Array Azimuth:	170.0°
Energy Specifications	
Cost of Electricity:	11.2 ¢/kWh

Results			
Month	Solar Radiation (kWh/m ^{2}/day)	AC Energy (kWh)	Energy Value ($)
1	3.61	8113	908.66
2	4.19	8458	947.30
3	4.76	10208	1143.30
4	5.20	10509	1177.01
5	5.39	10996	1231.55
6	5.45	10305	1154.16
7	5.52	10637	1191.34
8	5.39	10511	1177.23
9	5.21	10075	1128.40
10	4.60	9379	1050.45
11	3.59	7498	839.78
12	3.17	6974	781.09
Year	4.68	113664	12730.37

Output Hourly Performance Data

About the Hourly Performance Data

Output Results as Text

Saving Text from a Browser

Run PVWATTS v.1 for another US location or an International location
Run PVWATTS v.2 (US only)

Please send questions and comments regarding PVWATTS to Webmaster

Disclaimer and copyright notice

Return to RReDC home page (http://www.nrel.gov/rredc)


RReDC

APPENDIX F

Photos

ECM-1 Add Insulation on Fiberglass Wall Panels

Existing Panels

ECM-2 Replace Boilers with Condensing Boilers

Existing Boilers

ECM-3 Install Programmable Thermostats on Split Units

Existing Split Units

ECM-4 Replace Electric DHW Heaters with Gas Fired Condensing DHW Heaters

Existing DHW Heater

ECM-L1 Lighting Replacement / Upgrades

Existing T12 Lamps

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Manual Light Switches

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

See ECM L-1 and L-2

APPENDIX G

EPA Benchmarking Report

ENERGY STAR® Statement of Energy Performance

68

ENERGY STAR® Score[1]

Elmer Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 21,240
Built: 1956

For Year Ending: April 30, 2014
Date Generated: May 30, 2014

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Elmer Elementary School 207 Front Street Elmer, New Jersey 08318	Pittsgrove Township Schools 1083 Almond Road Pittsgrove, NJ 08318 (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4060606

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
67.5 kBtu/ft²

Source EUI
119.9 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	497,927 (35%)
Natural Gas (kBtu)	936,804 (65%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	80.4
National Median Source EUI (kBtu/ft²)	142.7
% Diff from National Median Source EUI	-16%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	113

Signature & Stamp of Verifying Professional

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

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)