BLOOMFIELD SCHOOL DISTRICT

FOREST GLEN ELEMENTARY SCHOOL

280 Davey Street Bloomfield NJ, 07003

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. 30040

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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 Bloomfield 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
Forest Glen Elementary School	280 Davey Street Bloomfield NJ, 07003	30,120	1957

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

Building Name	Electric Savings (kWh)	NG Savings (therms)	Total Savings ($)	Payback (years)
Forest Glen Elementary School	51,651	5,512	$15,755	16.6

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.

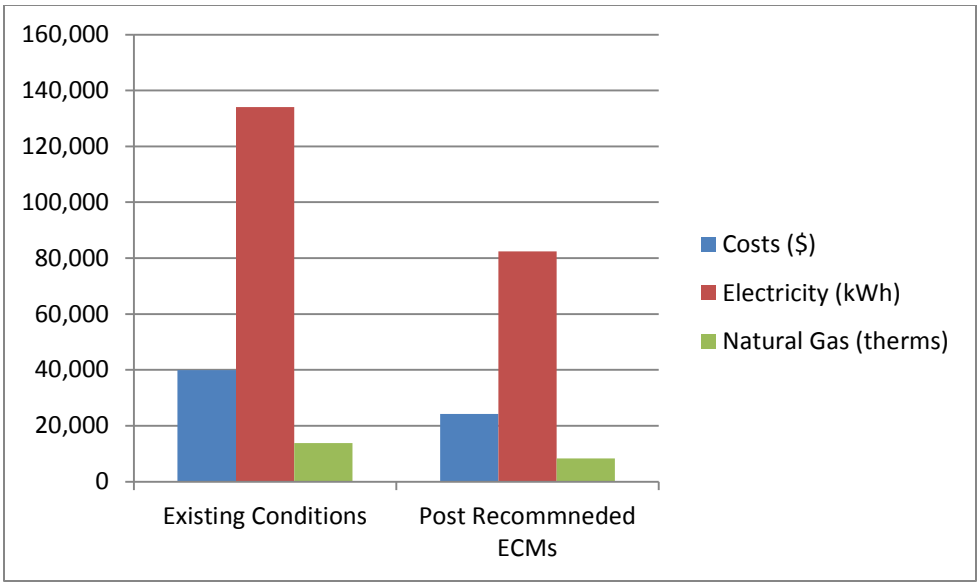
Summary of Energy Conservation Measures

ECM #	Energy Conservation Measure	Est. Costs ($)	Est. Savings ($/year)	Payback w/o Incentive	Potential Incentive ($)*	Payback w/ Incentive	Recommended
ECM-1	Replace single pane windows with energy efficient double pane windows	353,800	2,684	131.8	0	131.8	N
ECM-2	Add condensing boiler	189,287	6,090	31.1	2,500	30.7	Y
ECM-3	Replace motors	2,231	72	31.1	153	28.9	N
ECM-4	Install window ac unit controllers	1,200	634	1.9	0	1.9	Y
ECM-L1**	Lighting Replacements / Upgrades	67,283	8,757	7.7	11,350	6.4	N
ECM-L2**	Install Lighting Controls (Add Occupancy Sensors)	4,104	1,411	2.9	640	2.5	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	71,387	9,031	7.9	11,990	6.6	Y
	Total**	**617,905**	**18,511**	**33.4**	**14,643**	**32.6**	
	Total(Recommended)	261,874	15,755	16.6	14,490	15.7	

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

If Bloomfield School District implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	**Post Recommended ECMs**	**Percent Savings**
Costs ($)	39,944	24,189	39%
Electricity (kWh)	134,115	82,464	39%
Natural Gas (therms)	13,815	8,303	40%
Site EUI (kbtu/SF/Yr)	61.1	36.9	


160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Existing Conditions
Post Recommneded ECMs
Costs ($)
Electricity (kWh)
Natural Gas (therms)

2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

The following is a summary of building information related to HVAC, plumbing, building envelope, lighting, 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 representative photos of some of the existing conditions observed while onsite.

Building Name: Forest Glen Elementary School
Address: 280 Davey Street Bloomfield NJ 07003
Gross Floor Area: 30,120 sq. ft.
Number of Floors: Single story
Year Built: 1957

General

Description of Spaces: The building is used as an elementary school and has classrooms, library, all purpose room, offices, storage rooms, restrooms and a boiler room...
Description of Occupancy: The facility has 38 permanent employees working during regular school hours.
Number of Computers: The building has approximately 15 desktop and laptop computers.
Building Usage: Normal operating hours for the school are from 8.30 AM to 3.30 PM. However, some of the employees like office staff, teaching staff and custodial staff work before and after the normal school operating hours.

Construction: Structural steel framing with concrete masonry unit walls having a brick exterior façade.
Roof: The building has a flat roof with a black rubber membrane waterproofing. It is believed that the roof is well insulated and appears to be in good condition. No ECM associated with the roof has been evaluated.
Windows: The building has single pane windows that are in fair condition. An ECM related to window replacement has been evaluated.
Exterior Doors: Exterior man doors are steel with glass panels and are in good condition. The door seals and sweeps show signs of wear. We have included the replacement of door seals and sweeps as an O&M measure.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: The building is heated by one Kewanee hot water boiler located in the basement boiler room. The boiler, with an input rating of 2479 MBH, was installed in 1958. Two hot water pumps installed in the boiler room circulate heating hot water to all the unit ventilators, heating and ventilation unit and finned tube radiators. All Classrooms are provided with unit ventilators. Hallways, stairways, storage spaces and offices are provided with finned tube radiators. The all purpose room is heated by a heating and ventilation unit equipped with hot water heating coil. All equipment is over 25 years old and although they are well maintained and operate satisfactorily, they are consuming more energy due to their age. ECMs related to adding a condensing hot water boiler and replacing motors of the hot water pumps and the multi-purpose room H&V unit have been evaluated.

Cooling: The library, conference room, classroom 4, nurse's office, principal's office and main office are provided with window air conditioners. The window air conditioners are in good condition. No ECM associated with the cooling equipment has been evaluated.

Details of the equipment are shown in the Table below:

Description	Manufacturer Name	Equipment Type / Utility	Capacity/Size /Efficiency	Location	Areas/Equipment Served
Boiler	Kewanee	Gas fired fire tube hot water boiler	2479 MBH Input	Boiler Room in basement	Heating system for whole School
Hot Water Pumps	Sterling	Base mounted Hot Water Pumps with 3.0 HP electric motor	N/A	Boiler Room in basement	Heating system for whole School
Heating and Ventilation Unit	Nesbitt	H&V Unit with hot water heating coil and belt driven 1 HP electric motor	N/A	Mezzanine of All Purpose Room	All Purpose Room

Unit Ventilators	Nesbitt	Unit Ventilators with hot water heating coils	N/A	Classrooms	Classrooms
Unit Ventilators	Herman Nelson/ MSI	Unit Ventilator with steam heating coil	N/A	Classrooms in Basement, Ist and 2nd floors	Classrooms

Ventilation: Unit ventilators provided for classrooms take in outside air for ventilation through a ducted connection to an outside air intake louver. Outside air is controlled by unit ventilator dampers that are pneumatically operated. The multi-purpose room heating and ventilation unit has a ducted air intake connection from an outside air intake louver. The outside air intakes are in good condition. There is no ECM associated with the ventilation system.

Exhaust: This building has multiple fractional HP exhaust fans serving restrooms and general exhaust located on the roof. The fans are enclosed and therefore the capacities of fan motors are unknown. No ECMs were evaluated for the exhaust fans.

Controls Systems

The overall heating system controls are pneumatically operated. The boiler and pumps' operation is controlled by a newly installed Heat Timer control system installed in the boiler room. The Heat Timer controls are interfaced with the original pneumatic control system. An air compressor by Quincy with an air dryer unit is installed in the boiler room that supplies compressed air to all the controls in the school building. Unit ventilators are equipped with two way pneumatic control valves controlled by room thermostats. The heating and ventilation unit serving the all purpose room is controlled by a three way pneumatically controlled valve. A differential pressure bypass is installed at the constant flow hot water pumps. The control system is well maintained and is in good condition. Window air conditioners are controlled by individual thermostats. Heating set point was reported to be 70^0 F.

Although the existing pneumatic control system is in good working condition and provides basic day/night functions, the School District should consider replacing the existing pneumatic control system with a direct digital Control (DDC) system. The advantages of this type of system include individual unit controllability and scheduling, trending of set points and alarm notifications for malfunctioning devices. Front end graphics available in a DDC system enable the maintenance staff to see the functioning of all systems at one location and provide service to trouble spots quickly and efficiently. Web based control systems allow access and adjustment from remote locations. The cost as well as the payback period for upgrading the pneumatic control system to a DDC control system is high, therefore further study is recommended prior to pursuing this as an energy conservation measure.

An ECM related to installing window AC unit controllers has been evaluated.

Domestic Hot Water Systems

Domestic hot water to the entire school is provided by a Vanguard gas fired water heater installed in the boiler room. Domestic hot water is circulated by a Taco pump also installed in the boiler room. The water heater and the recirculating pump, installed in 2005, are in good condition. No ECM related to replacing the water heater or the recirculating pump has been evaluated.

Kitchen Equipment

There is no kitchen in this building. Prepared food is brought from outside and warmed up in the school. Food warming equipment is in good condition hence no ECM related to kitchen equipment has been evaluated.

Plug Load

This building has computers and printers/copiers which contribute to the plug load in the building. We have calculated the plug load to have minimal impact compared to other electric consuming devices. A recommendation has been included in the O&M section to purchase Energy Star rated equipment when the old ones need replacement.

Plumbing Systems

The urinals and toilets appear to be high flow plumbing fixtures. The sink faucets do not appear to have low-flow type aerators. An analysis for reducing the water consumption was not performed since the school informed us that water is provided to them at no cost. Although the cost of water usage in most facilities is relatively small compared with costs of electric and gas usage, reducing water usage helps conserve and protect vital water supply sources. Hence, a recommendation has been included in the O&M section to install low-flow plumbing fixtures and aerators when fixture replacement is planned.

Lighting Systems

The school has a mixture of T-12 and T-8 fluorescent lighting fixtures. The All Purpose room has twenty eight (28) 400 watt metal halide lights and the stage has six (6) 400 watt metal halide lights. Some spaces like the boiler room, restrooms, janitor's closets and storage rooms are provided with incandescent lights. Exterior lights are a mixture of incandescent and compact fluorescent lights. All the lights in this building are controlled by manual switches except exterior lights which are controlled by timer. LED lights are recommended in this study. We have provided three alternatives for the observed 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

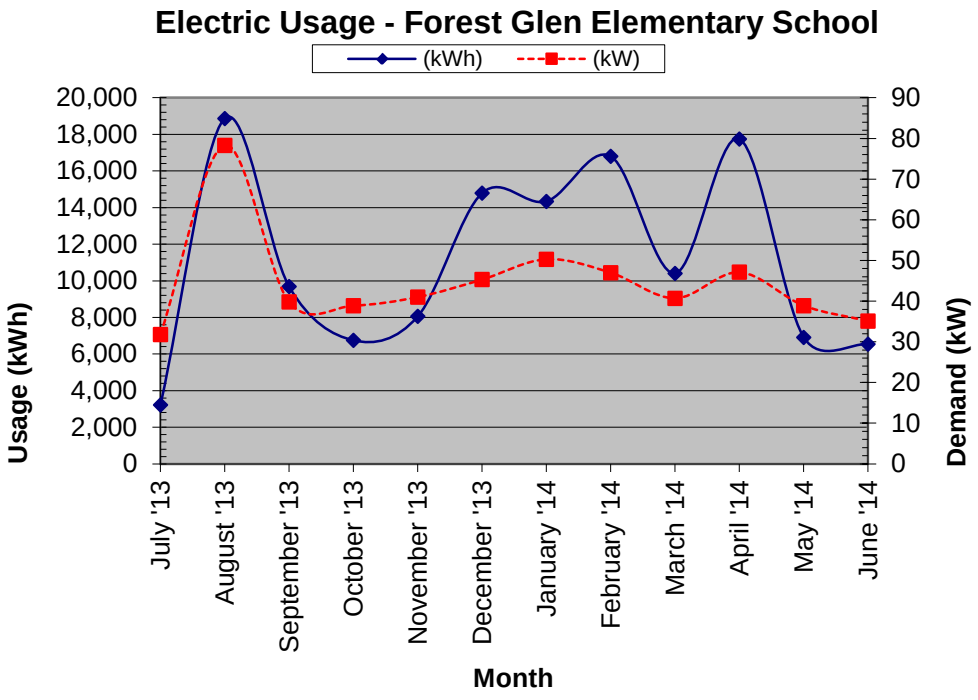
Natural gas and electricity are separately metered into this building. Utilities used by the building are delivered and supplied by the following utility companies:

	Electric	Natural Gas
Deliverer	PSE&G	PSE&G
Supplier	Direct Energy	PSE&G

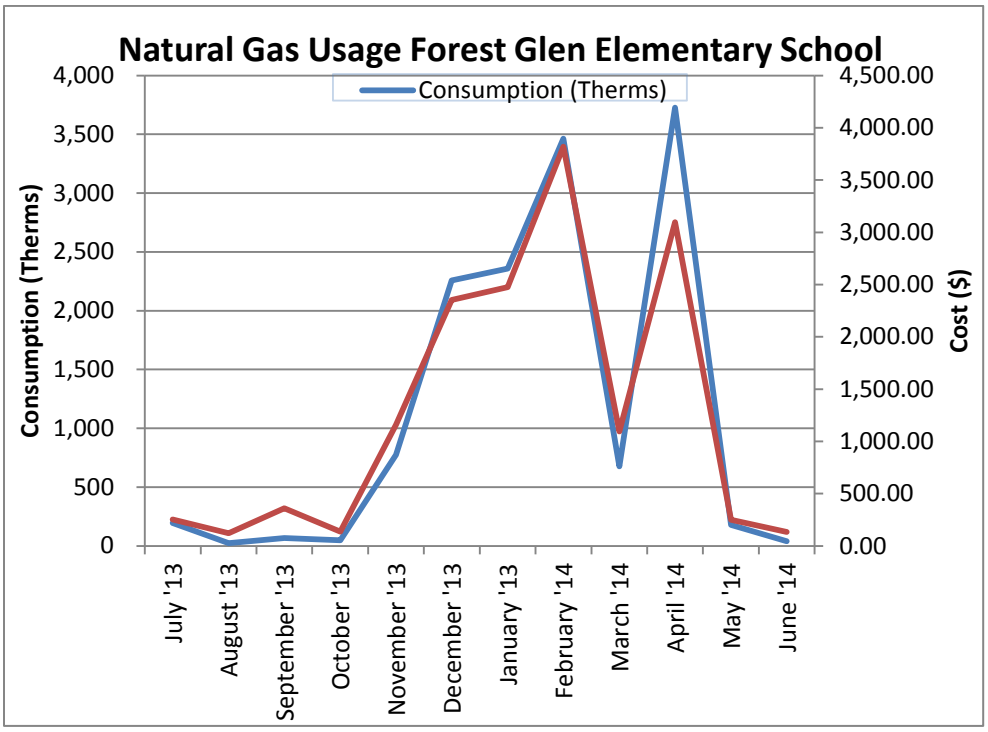
For the 12-month period ending in June 2014, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	134,115	kWh
Annual Cost	24,685	$
Blended Unit Rate	0.184	$/kWh
Supply Rate	0.134	$/kWh
Demand Rate	8.47	$/kW
Peak Demand	78.3	kW
Natural Gas		
Annual Consumption	13,815	Therms
Annual Cost	15,259	$
Unit Rate	1.105	$/therm

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



The electric usage fluctuates with the building usage. The major electricity consuming loads in the building are lighting and window air conditioners. The fluctuations are likely due to the use of building spaces particularly the multi-purpose room that has 28 metal halide lights each of 400 watts and office spaces that have window air conditioners.



Natural gas in this building is used by the hot water boiler and domestic hot water heater (DHW). The gas usage in non-heating season is small and only for DHW heating. The gas usage during the heating season varies with winter weather conditions.

See Appendix A for 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	Average Rate	NJ Average Rate	
Electricity	$/kWh	$0.184	$0.13	Y
Natural Gas	$/Therm	$1.105	$0.96	Y

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

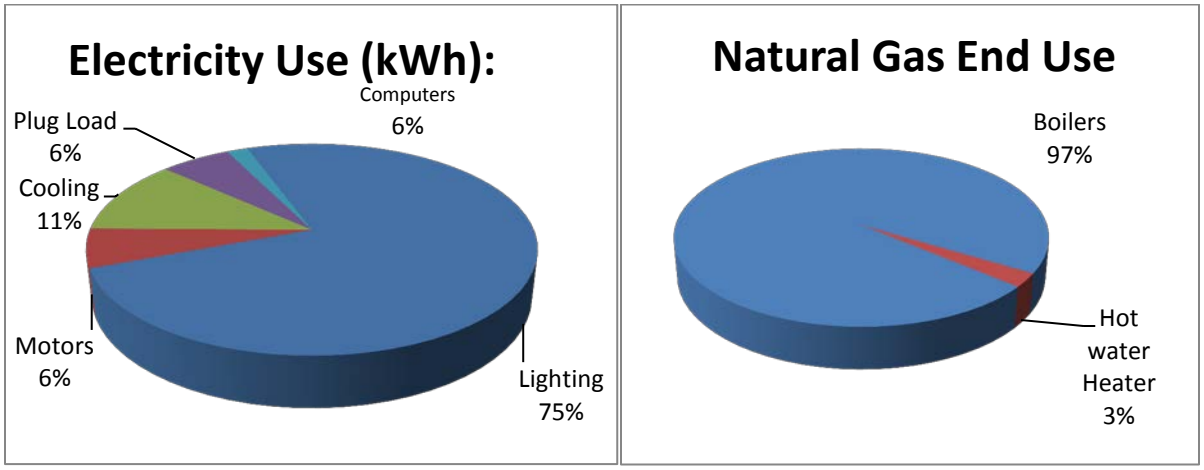
Additional information on selecting a third party energy supplier is available here:

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



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. However, the EPA does not have score for all types of buildings. The buildings that do not have energy rating now are compared with national median EUI.

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.

Site EUI kBtu/ft^2/yr	Source EUI (kBtu/ft^2/yr)	Energy Star Rating (1-100)
61.1	95.9	54

The school building's Energy Star score is 54. The score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide. A score of 50 represents median energy performance and a score of 75 or higher indicates that the building is a top performer. The site EUI of the school building is 61.1 and source EUI is 95.9. The building has lower EUIs than the national median EUIs (national median site EUI is 63.4 kBtu/ft^2 and national median source EUI is 99.5 kBtu/ft^2). The EUI of this building is (-)4% lower than national median. The EUI could be further reduced after implementing some of the proposed energy conservation measures.

The EPA Portfolio Manager can be accessed with the following:

[redacted]

[redacted]

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-1Replace Single Pane Windows with energy efficient Double Pane Windows

The building has old steel frame single pane windows which lead to large amount of the heating/cooling loss. Replacing these old windows with high heat resistance double pane windows will help reduce the energy loss and save energy.

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

ECM-1 Replace Single Pane Windows with energy efficient Double Pane Windows

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
353,800	0	0	2,429	2,684	(0.8)	0	131.8	131.8

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

This measure is not recommended due to the long payback period.

5.2 ECM-2 Add condensing hot water boiler

The existing hot water boiler is the original boiler installed in 1958. It is working at considerably reduced efficiency. This ECM evaluates adding a high efficiency condensing gas boiler to operate as the main boiler with the existing boiler to operate as a back-up heat source. The existing boiler efficiency is 75% (observed) and the proposed boiler efficiency is 94% (average seasonal efficiency). Electrical power consumption due to the pump operation is considered to be the same for both the proposed system and the baseline system. The existing Heat Timer control system will be reconfigured to operate the HHW system to provide a HHW temperature reset according to the outdoor air temperature.

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

ECM-2 Add condensing hot water boiler

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
189,287	0	0	5,512	6,090	(0.2)	2,500	31.1	30.7

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

Although the payback is long, this measure is recommended due to the age of equipment.

5.3 ECM-3 Replace motors

Motors of the hot water pumps and the multi-purpose unit are old and less efficient. Replacing them with new energy efficient motors will provide energy savings. This ECM evaluates the electrical savings associated with replacing less efficient electric motors with NEMA standard MG-1 rated motors

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

ECM-3 Replace Motors

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
2,231	0	422	0	72	(0.3)	153	31.1	28.9

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

This measure is not recommended due to the long payback period.

5.4 ECM-4 Install Window AC Unit Controllers

Window A/C units are currently controlled manually by the occupants and may not be turned off when the room is unoccupied. This ECM evaluates implementation of a digital timer device that will automatically turn the window A/C unit off at a preset time

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

ECM-4 Install Window AC Unit Controllers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
1,200	0	3,445	0	634	9.6	0	1.9	1.9

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

This measure is recommended.

5.5.1 ECM-L1 Lighting Replacement / Upgrades

The school has a mixture of T-12 and T-8 fluorescent lighting fixtures. The All Purpose room has twenty eight (28) 400 watt metal halide lights and the stage has six (6) 400 watt metal halide lights. Some spaces like the boiler room, restrooms, janitor's closets and storage rooms are provided with incandescent lights. Exterior lights are a mixture of incandescent and compact fluorescent lights. All the lights in this building are controlled by manual switches except exterior lights which are controlled by timer.

Overall energy consumption can be reduced by replacing inefficient bulbs and linear fluorescent bulbs with more efficient LED technology. 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
67,283	25	46,162	0	8,757	1.5	11,350	7.7	6.4

* 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.

5.5.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

The majority of the interior lights 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 Section ECM-L1, 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
4,104	0	7,669	620	1,411	4.2	640	2.9	2.5

* 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.

5.5.3 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
71,387	25	48,206	0	9,031	1.4	11,990	7.9	6.6

* 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 recommended.

5.6 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 door seals and sweeps.
- Purchase Energy Star rated equipment when old ones need replacement.
- Upgrade the plumbing fixtures to low flow plumbing fixtures and aerators when needed

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 city 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.

Forest Glen Elementary School qualifies for the direct install program since the peak electric demand in the evaluated 12 month period was below 200 KW.

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.

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 rooftop photovoltaic (PV) solar panels for power generation. 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 amount of available roof area determines how large of a solar array can be installed on any given roof. The table below summarizes the approximate roof area available on the building and the associated solar array size that can be installed.

Available Roof Area (Ft^2)	Potential PV Array Size (kW)
10,097	68

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 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 $200/SREC for 2015 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 – 68 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
$272,000	68	86,692	0	$15,951	$17,338	17.1	8.2	FS

Note: CHA typically recommends a more detailed evaluation be conducted for the installation of PV Solar arrays when the screening evaluation shows a payback of less than 20 years. Therefore, this ECM is recommended for further study. Before implementation is pursued, the school should consult with a certified solar PV contractor.

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.

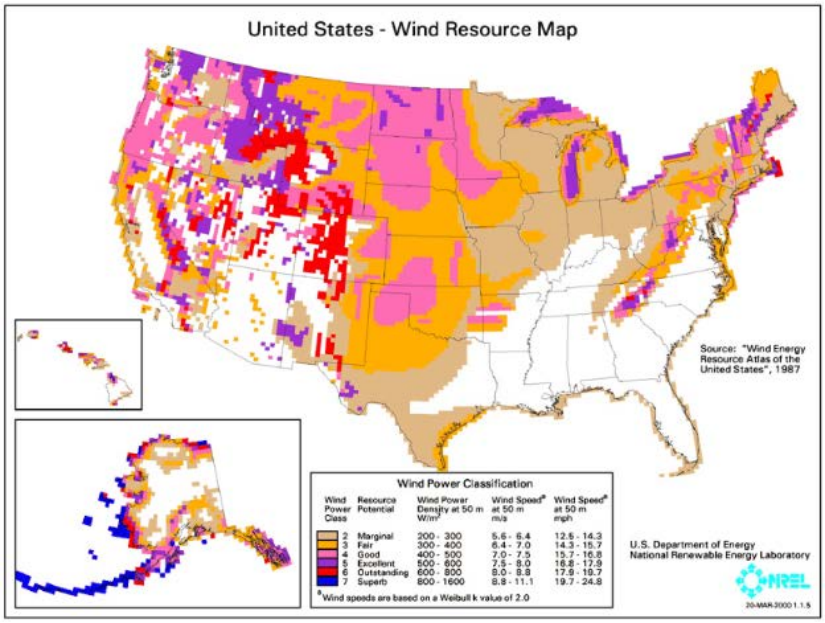
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping). 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 building 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 building.

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 building.

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. However, a mini-size CHP could be an option for Bloomfield School District to consider. The sizing and energy savings of the mini-size CHP require further study.

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 2014 through December 2014 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
78.3	31.8	46.0	N	N

*the demand is estimated from one month bill

This measure is not recommended due to the low demand usage.

8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for the Bloomfield School District at Forest Glen Elementary School.

The following projects should be considered for implementation:

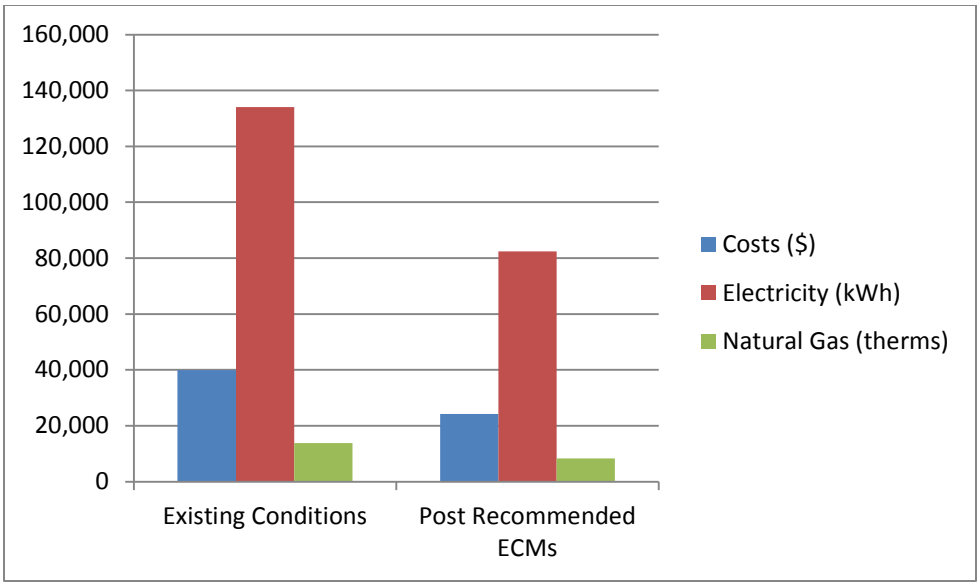
- Add condensing boiler
- Install window AC unit controllers
- Lighting Replacements with Controls (Occupancy Sensors)

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)
51,651	5,512	15,755	16.6

If the Bloomfield School District implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	39,944	24,189	39%
Electricity (kWh)	134,115	82,464	39%
Natural Gas (therms)	13,815	8,303	40%
Site EUI (kbtu/SF/Yr)	61.1	36.9	



Next Steps: This energy audit has identified several areas of potential energy savings. Bloomfield School District can use this information to pursue incentives offered by the NJBPU's NJ Clean Energy Program. A close out meeting will be scheduled with school staff members to review the ECMs and possible incentive options.

APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

Forest Glen Elementary School
280 Davey Street Bloomfield, NJ 07003

Forest Glen Elementary School

Annual Utilities

12-month Summary

Electric		
Annual Usage	134,115	kWh/yr
Annual Cost	24,685	$
Blended Rate	0.184	$/kWh
Consumption Rate	0.134	$/kWh
Demand Rate	8.47	$/kW
Peak Demand	78.3	kW
Min. Demand	31.8	kW
Avg. Demand	46.0	kW
Natural Gas		
Annual Usage	13,815	Therms/yr
Annual Cost	15,259	$
Rate	1.105	$/Therm

Forest Glen Elementary School
280 Davey Street Bloomfield, NJ 07003

Utility Bills: Account Numbers

Account Number	Building	Location	Type	Notes
6651492118	Forest Glen Elementary School	280 Davey Street Bloomfield, NJ 07003	Electricity	
6651492118	Forest Glen Elementary School	280 Davey Street Bloomfield, NJ 07003	Natural Gas	

Forest Glen Elementary School
280 Davey Street Bloomfield, NJ 07003

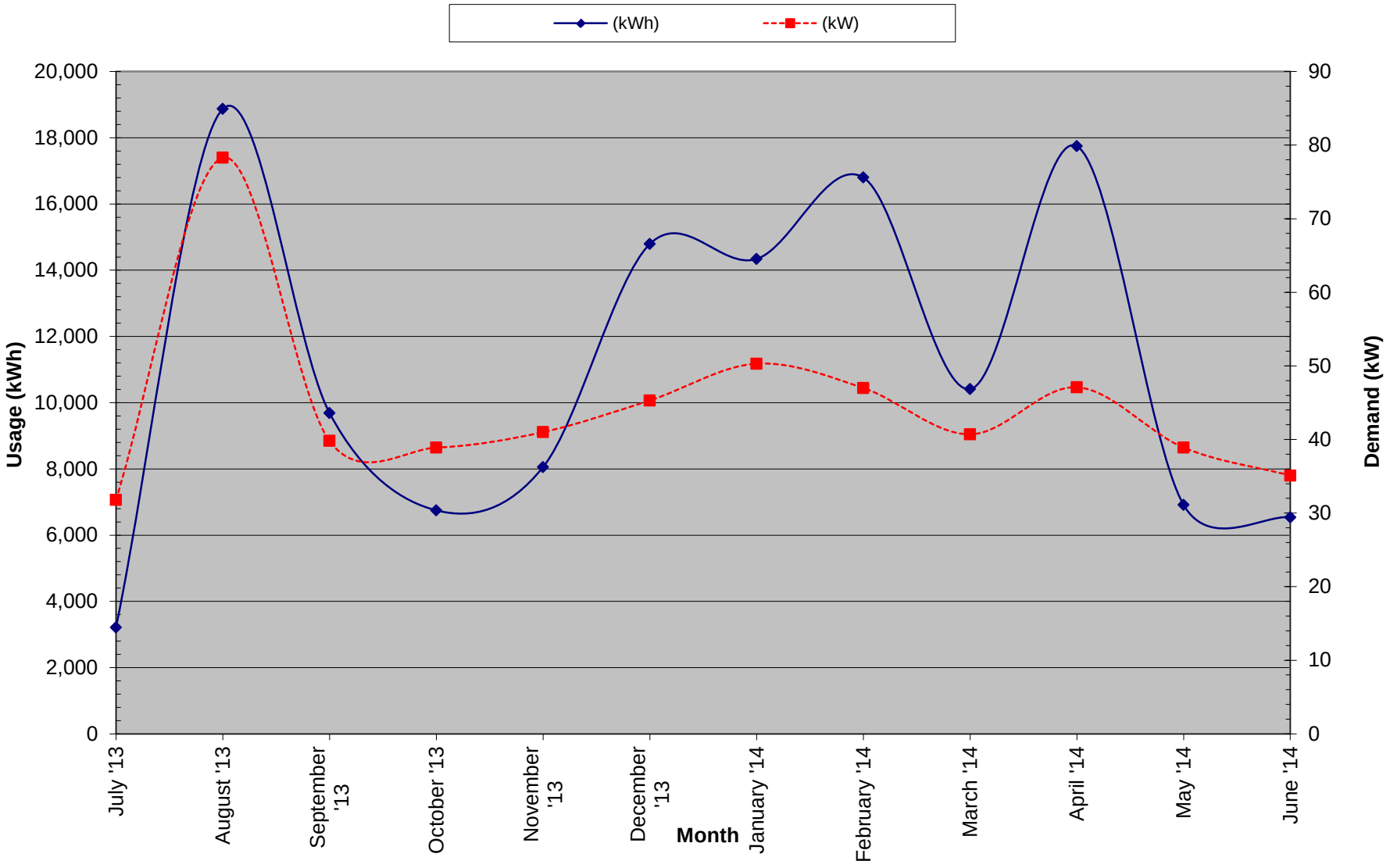
For Service at: **Forest Glen Elementary School**
Account No.: **6651492118** **Delivery -** PSE&G
Meter No.: **278004933** **Supplier -** DIRECT ENERGY
Electric Service

			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)**
July '13	3,210	31.8	$ 523.18	$ 392.51	$915.69	$ 526.95	$ 388.74	$ 0.29	$ 0.16	$ 12.22
August '13	18,870	78.3	$ 1,726.68	$ 2,163.96	$3,890.64	$ 2,933.47	$ 957.17	$ 0.21	$ 0.16	$ 12.22
September '13	9,690	39.8	$ 1,673.44	$ 1,110.68	$2,784.12	$ 1,516.44	$ 1,267.68	$ 0.29	$ 0.16	$ 31.85
October '13	6,750	38.9	$ 400.91	$ 788.45	$1,189.36	$ 1,032.85	$ 156.51	$ 0.18	$ 0.15	$ 4.02
November '13	8,055	41.0	$ 454.74	$ 946.85	$1,401.59	$ 1,226.09	$ 175.50	$ 0.17	$ 0.15	$ 4.28
December '13	14,790	45.3	$ 703.06	$ 1,689.36	$2,392.42	$ 2,198.51	$ 193.91	$ 0.16	$ 0.15	$ 4.28
January '14	14,340	50.3	$ 694.79	$ 1,669.55	$2,364.34	$ 2,149.03	$ 215.31	$ 0.16	$ 0.15	$ 4.28
February '14	16,800	47.0	$ 749.38	$ 1,948.77	$2,698.15	$ 2,496.97	$ 201.18	$ 0.16	$ 0.15	$ 4.28
March '14	10,410	40.7	$ 515.37	$ 1,176.33	$1,691.70	$ 1,517.49	$ 174.21	$ 0.16	$ 0.15	$ 4.28
April '14	17,745	47.1	$ 780.05	$ 1,992.76	$2,772.81	$ 330.88	$ 201.61	$ 0.16	$ 0.02	$ 4.28
May '14	6,915	38.9	$ 394.53	$ 776.55	$1,171.08	$ 1,004.57	$ 166.51	$ 0.17	$ 0.15	$ 4.28
June '14	6,540	35.1	$ 678.76	$ 734.44	$1,413.20	$ 985.85	$ 427.35	$ 0.22	$ 0.15	$ 12.18
Total (last 12-months)	**134,115**	**78.30**	**$9,294.89**	**$15,390.21**	**$24,685.10**	**$17,919.10**	**$4,525.68**	**$ 0.184**	**$ 0.134**	**$ 8.472**
Notes	1	2	3	4	5	6	7	8	9	10

1.) Based on Direct Energy t 27,800.00

July '13 thru Oct '13 - $0.1092/KWH + KW Demand x $1.32
Nov '13 and Dec '13 - $0.1092/KWH + KW Demand x $1.64
Jan '14 - $0.1092/KWH + KW Demand x $2.06
Feb '14 - $0.1092/KWH + KW Demand x $2.43
March '14 - $0.1092/KWH + Trans. Adj. $0.0038/KWH
Apr '14 thru June '14 - $0.1092/KWH + Trans. Adj. $0.0031/KWH

Electric Usage - Forest Glen Elementary School

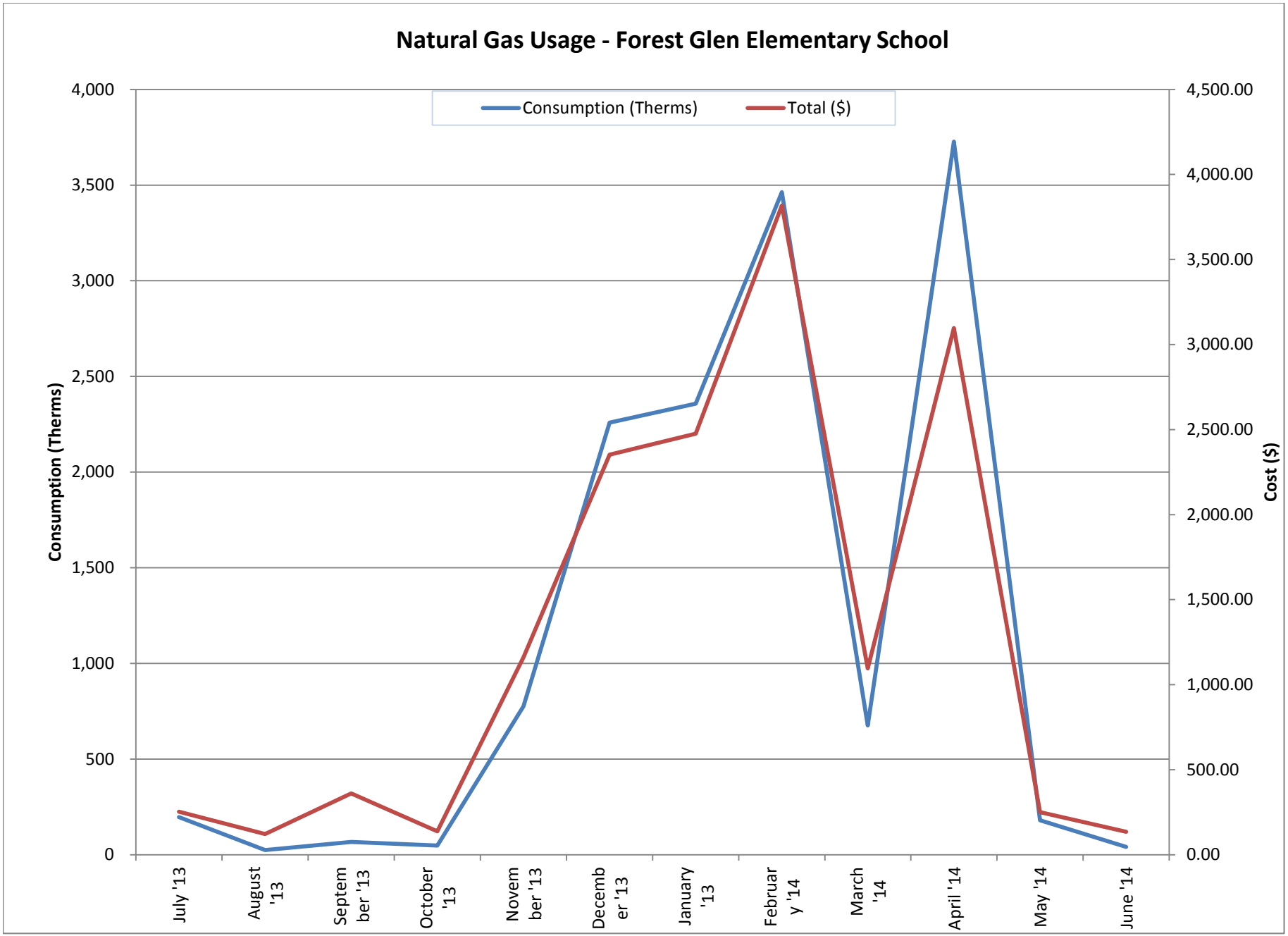


Utility Data -Forest Glen ES.xlsx
Electric Graph

Forest Glen Elementary School
280 Davey Street Bloomfield, NJ 07003

For Service at: **Forest Glen Elementary School**
Account No.: **6651492118**
Meter No.: **2643291**
Natural Gas Service
Delivery - PSE&G
Supplier - PSE&G

		Charges			Unit Costs		
Month	**Consumption (Therms)**	**Delivery ($)**	**Supply ($)**	**Total ($)**	**Delivery ($/Therm)**	**Supply ($/Therm)**	**Total ($/Therm)**
July '13	196	$ 132	$ 121	$ 253	$ 0.67	$ 0.62	$ 1.29
August '13	24	$ 108	$ 14	$ 122	$ 4.50	$ 0.58	$ 5.08
September '13	67	$ 322	$ 39	$ 361	$ 4.81	$ 0.58	$ 5.39
October '13	48	$ 111	$ 27	$ 138	$ 2.31	$ 0.56	$ 2.88
November '13	776	$ 725	$ 435	$ 1,160	$ 0.93	$ 0.56	$ 1.49
December '13	2,259	$ 1,050	$ 1,303	$ 2,353	$ 0.46	$ 0.58	$ 1.04
January '13	2,358	$ 947	$ 1,529	$ 2,476	$ 0.40	$ 0.65	$ 1.05
February '14	3,463	$ 1,178	$ 2,640	$ 3,818	$ 0.34	$ 0.76	$ 1.10
March '14	676	$ 581	$ 515	$ 1,096	$ 0.86	$ 0.76	$ 1.62
April '14	3,727	$ 479	$ 2,618	$ 3,097	$ 0.13	$ 0.70	$ 0.83
May '14	180	$ 124	$ 126	$ 250	$ 0.69	$ 0.70	$ 1.39
June '14	41	$ 107	$ 28	$ 135	$ 2.61	$ 0.68	$ 3.29
Total (12 - Month)	**13,815**			**$ 15,259.00**			**$ 1.105**


Natural Gas Usage - Forest Glen Elementary School
Consumption (Therms)
Total ($)
Consumption (Therms)
Cost ($)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
4,500.00
4,000.00
3,500.00
3,000.00
2,500.00
2,000.00
1,500.00
1,000.00
500.00
0.00
July '13
August '13
Septem ber '13
October '13
Novem ber '13
Decemb er '13
January '13
Februar y '14
March '14
April '14
May '14
June '14

PSE&G GAS SERVICE TERRITORY
Last Updated: 12/11/14

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

Supplier	Telephone & Web Site	*Customer Class
Ambit Northeast, LLC d/b/a Ambit Energy 103 Carnegie Center Suite 300 Princeton, NJ 08540	877-282-6284 www.ambitenergy.com	**R/C** **ACTIVE**
Amerigreen Energy, Inc. **333 Sylvan Avenue Suite 206** **Englewood Cliffs, NJ 07632**	(888)559-4567 www.amerigreen.com	**R/C/I** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	888-850-1872 www.AstralEnergyLLC.com	**R/C/I** **ACTIVE**
BBPC, LLC Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	**C** **ACTIVE**
Choice Energy, LLC **4257 US Highway 9, Suite 6C** **Freehold, NJ 07728**	(888) 565-4490 www.4choiceenergy.com	**R/C/I**
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**
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07746	888 817-8572 www.commerceenergy.com	**R** **ACTIVE**
Compass Energy Services, Inc. 33 Wood Avenue South, 610 Iselin, NJ 08830	866-867-8328 www.compassenergy.net	**C/I** **ACTIVE**

Compass Energy Gas Services, LLC 33 Wood Avenue South Suite 610 Iselin, NJ 08830	866-867-8328 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 Energy, Inc. **d/b/a Con Edison Solutions** 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-686-1383 x2130 www.conedenergy.com	
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 116 Village Boulevard, Suite 200 Princeton, NJ 08540	800-785-4373 www.constellation.com	**C/I** **ACTIVE**
Constellation Energy Gas Choice, Inc. 116 Village Blvd., Suite 200 Princeton, NJ 08540	800-785-4373 www.constellation.com	**R/C/I** **ACTIVE**
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 http://www.business.directenergy.com/	**R** **ACTIVE**
Direct Energy Business Marketing, LLC (fka Hess Energy Marketing) One Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergy.com	**R** **ACTIVE**

Direct Energy Small Business, LLC (fka Hess Small Business Services, LLC) One Hess Plaza Woodbridge, NJ 07095	(888) 464-4377 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Gateway Energy Services Corp. 120 Wood Avenue Suite 611 Iselin, NJ 08830	(866) 348-4193 www.gesc.com	**R/C** **ACTIVE**
Glacial Energy of New Jersey, Inc. 21 Pine Street, Suite 237 Rockaway, NJ 07866	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**
Harborside Energy LLC 101 Hudson Street, Suite 2100 Jersey City, NJ 07302	877-940-3835 www.harborsideenergynj.com	**R/C** **ACTIVE**
Hess Energy, Inc. One 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/I** **ACTIVE**
Hudson Energy Services, LLC 7 Cedar Street Ramsey, NJ 07446	877- Hudson 9 www.hudsonenergyservices.com	**C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	877-887-6866 www.idtenergy.com	**R/C** **ACTIVE**

Infinite Energy dba Intelligent Energy 1200 Route 22 East Suite 2000 Bridgewater, NJ 08807-2943	(800) 927-9794 www.InfiniteEnergy.com	**R/C/I** **ACTIVE**
Integrys Energy Services-Natural Gas, LLC 101 Eisenhower Parkway Suite 300 Roseland, NJ 07068	(800) 536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Jsynergy LLC 445 Cental Ave. Suite 204 Cedarhurst, NY 11516	(516) 331-2020 www.Jsnergyllc.com	**R/C/I** **ACTIVE**
Major Energy Services, LLC 1001 East Lawn Drive Teaneck NJ 07666	888-625-6760 www.majorenergy.com	**R/C/I** **ACTIVE**
Marathon Power LLC 302 Main Street Paterson, NJ 07505	888-779-7255 www.mecny.com	**R/C/I** **ACTIVE**
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	1-877-750-7046 www.metromediaenergy.com	**C/I** **ACTIVE**
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	888-53-Metro www.metroenergy.com	**R/C** **ACTIVE**
MPower Energy NJ LLC One University Plaza, Suite 507 Hackensack, NJ 07601	877-286-7693 www.mpowerenergy.com	**R/C/I** **ACTIVE**
NATGASCO (Supreme Energy, Inc.) 532 Freeman Street Orange, NJ 07050	800-840-4427 www.supremeenergyinc.com	**R/C/I** **ACTIVE**
New Energy Services LLC 101 Neptune Avenue Deal, New Jersey 07723	800-660-3643 www.newenergyservicesllc.com	**R/C/I** **ACTIVE**
New Jersey Gas & Electric 10 North Park Place Suite 420 Morristown, NJ 07960	866-568-0290 www.njgande.com	**R/C** **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 & Gas, LLC d/b/a North American Power 197 Route 18 South Ste. 300 New Brunswick, NJ 08816	888- 313-8086 www.napower.com	**R/C/I** **ACTIVE**
North Eastern States, Inc. d/b/a Entrust Energy 90 Washington Valley Road Bedminster, NJ 07921	(888) 535-6340 www.entrustenergy.com	**R/C/I** **ACTIVE**
Oasis Power, LLC d/b/a Oasis Energy 11152 Westheimer, Suite 901 Houston, TX 77042	(800)324-3046 www.oasisenergy.com	**R/C** **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**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	855-32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**
PPL EnergyPlus, LLC Shrewsbury Executive Offices 788 Shrewsbury Avenue Suite 2200 Tinton Falls, NJ 07724	(732) 741-0505 www.pplenergyplus.com	**C/I** **ACTIVE**
PPL EnergyPlus Retail, LLC Shrewsbury Executive Offices 788 Shrewsbury Avenue, Suite 220 Tinton Falls, NJ 07724	(732) 741-0505 – 2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Public Power & Utility of New Jersey, LLC One International Blvd, Suite 400 Mahwah, NJ 07495	(888) 354-4415 www.ppandu.com	**R/C/I** **ACTIVE**

Residents Energy, LLC 550 Broad Street Newark, NJ 07102	(888) 828-7374 www.residentsenergy.com	**R/C**
Respond Power LLC 1001 East Lawn Drive Teaneck, NJ 07666	(877) 973-7763 www.respondpower.com	**R/C/I** **ACTIVE**
Save on Energy, LLC 1101 Red Ventures Drive Fort Mill, SC 29707	1 (877) 658-3183 www.saveonenergy.com	**R/C** **ACTIVE**
SFE Energy One Gateway Center Suite 2600 Newark, NJ 07012	1 (877) 316-6344 www.sfeenergy.com	**R/C/I** **ACTIVE**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	(800) 695-0666 www.sjnaturalgas.com	**C** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	800-266-6020 www.southjerseyenergy.com	**R/C/I** **ACTIVE**
SouthStar Energy d/b/a New Jersey Energy 1085 Morris Avenue, Suite 155 Union, NJ 07083	(866) 477-8823 www.newjerseyenergy.com	**R/C** **ACTIVE**
Spark Energy Gas, LP/ Spark Energy 2105 City West Blvd. Suite 100 Houston, TX 77042	(713)600-2600 www.sparkenergy.com	**R/C/I** **ACTIVE**
Sperian Energy Corp. Bridgewater Center 1200 Route 22 East Bridgewater, NJ 08807	888-682-8082 www.sperianenergy.com	**R/C/I** **ACTIVE**
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	855-466-2842 www.spragueenergy.com	**C/I** **ACTIVE**
Stuyvesant Energy LLC 10 West Ivy Lane, Suite 4 Englewood, NJ 07631	800-640-6457 www.stuyfuel.com	**C** **ACTIVE**

Stream Energy New Jersey, LLC 309 Fellowship Road Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	**R/C** **ACTIVE**
Summit Energy Services, Inc. 10350 Ormsby Park Place Suite 400 Louisville, KY 40223	1 (800) 90-SUMMIT www.summitenergy.com	**C/I** **ACTIVE**
Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	877-797-8786 www.systrumenergy.com	**R/C/I** **ACTIVE**
Tiger Natural Gas, Inc. dba Tiger, Inc. 234 20th Avenue Brick, NJ 008724	888-875-6122 www.tigernaturalgas.com	**R/C/I** **ACTIVE**
UGI Energy Services, Inc. dba UGI Energy Link 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-427-8545 www.ugienergylink.com	**C/I** **ACTIVE**
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergylink.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 2001 Route 46 Waterview Plaza, Suite 301 Parsippany, NJ 07054	800-388-3862 www.lowcostpower.com	**R/C** **ACTIVE**
Viridian Energy PA LLC 2001 Route 46, Waterview Plaza Suite 230 Parsippany, NJ 07054	866-663-2508 www.viridian.com	**R/C** **ACTIVE**
Vista Energy Marketing, L.P. 197 State Route 18 South, Suite 3000 South Wing East Brunswick, NJ 08816	888-508-4782 www.vistaenergymarketing.com	**R/C/I** **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. 16th Floor 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**

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PSE&G ELECTRIC SERVICE TERRITORY
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***CUSTOMER CLASS - R – RESIDENTIAL C – COMMERCIAL I –INDUSTRIAL**

Supplier	Telephone & Web Site	*Customer Class
Abest Power & Gas of NJ, LLC 202 Smith Street Perth Amboy, NJ 08861	(888)987-6937 www.AbestPower.com	**R/C/I** **ACTIVE**
AEP Energy, Inc. f/k/a BlueStar Energy Services 309 Fellowship Road, Fl. 2 Mount Laurel, NJ 08054	(866) 258-3782 www.aepenergy.com	**R/C/I** **ACTIVE**
Alpha Gas and Electric, LLC 641 5th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	**R/C** **ACTIVE**
Ambit Northeast, LLC d/b/a Ambit Energy 103 Carnegie Center Suite 300 Princeton, NJ 08540	877-282-6284 www.ambitenergy.com	**R/C** **ACTIVE**
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com	**C/I** **ACTIVE**
Amerigreen Energy, Inc. 333Sylvan Avenue Englewood Cliffs, NJ 07632	888-559-4567 www.amerigreen.com	**R/C** **ACTIVE**
AP Gas & Electric, (NJ) LLC 10 North Park Place, Suite 420 Morristown, NJ 07960	(855) 544-4895 www.apgellc.com	**R/C/I** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(888)850-1872 www.AstralEnergyLLC.com	**R/C/I** **ACTIVE**
Barclays Capital Services, Inc. 70 Hudson Street Jersey City, NJ 07302-4585	(800) 526-7000 www.barclays.com	**C** **ACTIVE**
BBPC, LLC d/b/a Great Eastern Energy	(888) 651-4121	**C**

116 Village Blvd. Suite 200 Princeton, NJ 08540	www.greateasternenergy.com	**ACTIVE**
Berkshire Energy Partners, LLC 9 Berkshire Road Landenberg, PA 19350 Attn: Dana A. LeSage, P.E.	(610) 255-5070 www.berkshireenergypartners.com	**C/I** **ACTIVE**
Blue Pilot Energy, LLC 197 State Rte. 18 South Ste. 3000 East Brunswick, NJ 08816	(800) 451-6356 www.bluepilotenergy.com	**R/C** **ACTIVE**
Brick Standard, LLC 235 Hudson Street Suite 1 Hoboken, NJ 07030	(201)706-8101 www.standardalternative.com	**C/I** **ACTIVE**
CCES LLC dba Clean Currents Energy Services 566 Terhune Street Teaneck, NJ 07666	(877) 933-2453 www.cleancurrents.com	**R/C** **ACTIVE**
Champion Energy Services, LLC 1200 Route 22 Bridgewater, NJ 08807	(888) 653-0093 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. 1744 Lexington Avenue Pennsauken, NJ 08110	(888) CLR-VIEW (800) 746- 4702 www.clearviewenergy.com	**R/C/I** **ACTIVE**
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07446	1-866-587-8674 www.commerceenergy.com	**R/C** **ACTIVE**
Community Energy Inc. 51 Sandbrook Headquarters Road Stockton, NJ 08559	(866)946-3123 www.communityenergyinc.com	**R/C/I** **ACTIVE**
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	**C/I** **ACTIVE**

ConocoPhillips Company 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(800) 646-4427 www.conocophillips.com	**C/I** **ACTIVE**
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 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**
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	(212) 538-3124 www.creditsuisse.com	**C** **ACTIVE**
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 http://www.business.directenergy.com/	**R** **ACTIVE**
Direct Energy Business Marketing, LLC (fka Hess Energy Marketing) 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergy.com	**R** **ACTIVE**
Direct Energy Small Business, LLC (fka Hess Small Business Services, LLC) One Hess Plaza Woodbridge, NJ 07095	(888) 464-4377 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, New Jersey 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.me Midwest LLC 90 Washington Blvd Bedminster, NJ 07921	(855) 243-7270 www.energy.me	**R/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**
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**
Energy Service Providers, Inc., d/b/a New Jersey Gas & Electric 1 Bridge Plaza fl. 2 Fort Lee, NJ 07024	(866) 568-0290 www.njgande.com	**R/C** **ACTIVE**
FirstEnergy Solutions 150 West State Street Trenton, NJ 08608	(866) 625-7318 www.fes.com	**C/I** **ACTIVE**
Gateway Energy Services Corp. 120 Wood Avenue Suite 611 Iselin, NJ 08830	(866)348-4193 www.directenergybusiness.com	**R/C** **ACTIVE**
GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, NJ 08837	(866) 999-8374 www.gdfsuezenergyresources.com	**C/I** **ACTIVE**
GDF Suez Retail Energy Solutions LLC d/b/a THINK ENERGY 333 Thornall St. Sixth Floor Edison, NJ 08819	1-866-252-0078 www.mythinkenergy.com	**R/C/I** **ACTIVE**
Glacial Energy of New Jersey, Inc. 21 Pine Street, Suite 237 Rockaway, NJ 07866	(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	**R/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**
Harborside Energy LLC 101 Hudson Street Suite 2100 Jersey City, NJ 07302	(877) 940-3835 www.harborsideenergynj.com	**R/C** **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/I** **ACTIVE**
Hudson Energy Services, LLC 7 Cedar Street Ramsey, New Jersey 07446	(877) Hudson 9 www.hudsonenergyservices.com	**C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	(877) 887-6866 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**
Inspire Energy Holdings LLC 923 Haddonfield Road 3rd Fl. Building B2 Cherry Hill, NJ 08002	(866) 403-2620 www.inspireenergy.com	**R/C/I**
Integrys Energy Services, Inc. 33 Wood Ave, South, Suite 610 Iselin, NJ 08830	(800) 536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Jsynergy, LLC 445 Central Ave. Suite 204 Cedarhurst, NY 11516	(516) 331-2020 Jsynergyllc.com	**R/C/I** **ACTIVE**
Kuehne Chemical Company, Inc. 86 North Hackensack Avenue South Kearney, NJ 07032	(973) 589-0700 kuehnechemical@comcast.net	**I**

Liberty Power Delaware, LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	(866) 769-3799 www.libertypowercorp.com	**C/I** **ACTIVE**
Liberty Power Holdings, LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	(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**
Marathon Power LLC 302 Main Street Paterson, NJ 07505	(888) 779-7255 www.mecny.com	**R/C/I** **ACTIVE**
MP2 Energy NJ, LLC 111 River Street, Suite 1204 Hoboken, NJ 07030	(877) 238-5343 www.mp2energy.com	**R/C/I** **ACTIVE**
Natures Current, LLC 95 Fairmount Avenue Philadelphia, Pennsylvania 19123	(215) 464-6000 www.naturescurrent.com	**R/C/I** **ACTIVE**
MPower Energy NJ LLC One University Plaza, Suite 507 Hackensack, NJ 07601	(877) 286-7693 www.mpowerenergy.com	**R/C/I** **ACTIVE**
NATGASCO, Inc. (Supreme Energy, Inc.) 532 Freeman St. Orange, NJ 07050	(800) 840-4427 www.supremeenergyinc.com	**R/C/I** **ACTIVE**
New Jersey Gas & Electric 10 North Park Place Suite 420 Morristown, NJ 07960	(866) 568-0290 www.njgande.com	**R/C/** **ACTIVE**
NextEra Energy Services New Jersey, LLC 651 Jernee Mill Road Sayreville, NJ 08872	(877) 528-2890 Commercial (800) 882-1276 Residential www.nexteraenergyservices.com	**R/C/I** **ACTIVE**
Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.noblesolutions.com	**C/I** **ACTIVE**

Nordic Energy Services, LLC 50 Tice Boulevard, Suite 340 Woodcliff Lake, NJ 07677	(877) 808-1027 www.nordiceenergy.us.com	**R/C/I** **ACTIVE**
North American Power and Gas, LLC 222 Ridgedale Avenue Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
North Eastern States, Inc. d/b/a Entrust Energy 90 Washington Valley Road Bedminster, NJ 07921	(888) 535-6340 www.entrustenergy.com	**R/C/I** **ACTIVE**
Oasis Power, LLC d/b/a Oasis Energy 11152 Westheimer, Suite 901 Houston, TX 77042	(800)324-3046 www.oasisenergy.com	**R/C** **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**
Park Power, LLC 1200 South Church St. Suite 23 Mount Laurel, NJ 08054	(856) 778-0079 www.parkpower.com	**R/C/I** **ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**
Power Management Co., LLC b/b/a PMC Lightsavers Limited Liability Company 1600 Moseley Road Victor, NY 14564	(585) 249-1360 www.powermanagementco.com	**C/I** **ACTIVE**
PPL Energy Plus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com	**C/I** **ACTIVE**
PPL EnergyPlus Retail, LLC 788 Shrewsbury Avenue, Suite 220 Tinton Falls, NJ 07724	(732) 741-0505 – 2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Progressive Energy Consulting, LLC	(917) 837-7400	**R/C/I**

PO Box 4582 Wayne, New Jersey 07474	Progressivenrg@optionline.net	**ACTIVE**
Prospect Resources, Inc. 208 W. State Street Trenton, NJ 08608-1002	(847) 673-1959 www.prospectresources.com	**C** **ACTIVE**
Public Power & Utility of New Jersey, LLC One International Blvd, Suite 400 Mahwah, NJ 07495	(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	**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**
Residents Energy, LLC 550 Broad Street Newark, NJ 07102	(888) 828-7374 www.residentsenergy.com	**R/C**
Respond Power LLC 1001 East Lawn Drive Teaneck, NJ 07666	(877) 973-7763 www.majorenergy.com	**R/C/I** **ACTIVE**
Save on Energy, LLC 1101 Red Ventures Drive Fort Mill, SC 29707	1 (877)-658-3183 www.saveonenergy.com	**R/C**
SFE Energy One Gateway Center Suite 2600 Newark, NJ 07012	1 (877) 316-6344 www.sfeenergy.com	**R/C/I** **ACTIVE**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	(800) 695-0666 www.sjnaturalgas.com	**C** **ACTIVE**
SmartEnergy Holdings, LLC 100 Overlook Center 2nd Floor Princeton, NJ NJ 08540 United States of America	(800) 443-4440 www.smartenergy.com	**R/C/I** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 266-6020 www.southjerseyenergy.com	**R/C/I** **ACTIVE**

Spark Energy Gas, LP/ Spark Energy 2105 City West Blvd. Suite 100 Houston, TX 77042	(713)600-2600 www.sparkenergy.com	**R/C/I** **ACTIVE**
Sperian Energy Corp. 1200 Route 22 East, Suite 2000 Bridgewater, NJ 08807	(888) 682-8082 www.sperianenergy.com	**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 New Jersey, LLC 309 Fellowship Rd., Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	**R/C** **ACTIVE**
Summit Energy Services, Inc. 10350 Ormsby Park Place Suite 400 Louisville, KY 40223	1 (800) 90-SUMMIT www.summitenergy.com	**C/I** **ACTIVE**
Texas Retail Energy LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663 Attn: Chris Hendrix	(866) 532-0761 Texasretailenergy.com	**C/I** **ACTIVE**
TransCanada Power Marketing Ltd. 190 Middlesex Essex Turnpike, Suite 200 Iselin, NJ 08830	(877) MEGAWAT www.transcanada.com/powermarketing	**C/I** **ACTIVE**
TriEagle Energy, LP 90 Washington Valley Rd Bedminster, NJ 07921	(877) 933-2453 www.trieagleenergy.com	**R/C/I** **ACTIVE**
UGI Energy Services, Inc. dba UGI Energy Link 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(800) 427-8545 www.ugienergylink.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 2001 Route 46 Waterview Plaza Suite 301 Parsippany, NJ 07054	(800) 388-3862 www.lowcostpower.com	**R/C** **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. 16th Floor Newark, NJ 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**

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APPENDIX B

Equipment Inventory

CHA Project # 30040
Forest Glen Elementary School
280 Davey Street Bloomfield, NJ 07003

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.	Current year	Years Old	ASHRAE life expectancy
Boiler	1	Kewanee	N/A	N/A	Gas fired firetube hot water boiler	2479 MBH Input	N/A	Boiler Room in basement	Heating system for whole School	1958	-32		2015	57	25
Hot Water Pumps	2	Sterling	C825AM	203957	Base mounted Hot Water Pumps with 3.0 HP electric motor	N/A	N/A	Boiler Room in basement	Heating system for whole School	1958	-37		2015	57	20
Heating and Ventilation Unit	1	Nesbitt	N/A	N/A	H&V Unit with hot water heating coil and belt driven 1 HPelectric motor	N/A	N/A	Mezzanine of All Purpose Room	All Purpose Room	1958	-32		2015	57	25
Unit Ventilators	11	Nesbitt	N/A	N/A	Unit Ventilators with hot water heatingcoils	N/A	N/A	Classrooms	Classrooms	1958	-37		2015	57	20
Unit Ventilators	20	Herman Nelson/ MSI	N/A	N/A	Unit Ventilator with steam heating coil	N/A	N/A	Classrooms in Basement, Ist and 2nd floors	Classrooms	1958	-37		2015	57	20
Domestic Water Heater	1	Vanguard	5AU70	VGLN 0605A34990	Gas fired water heater	50 gallon storage, 38000 BTU natural gas input, 32.2 GPH Recovery	N/A	Boiler Room in basement	All spaces in School	2005	10		2015	10	20
Domestic HW Circulating Pump	1	Taco	007-BF5	N/A	Centrifugal pump with 1/25 HP electric motor	N/A	N/A	Boiler Room in basement	All spaces in School	2005	0		2015	10	10

APPENDIX C

ECM Calculations

Bloomfield School District - LGEA
CHA Project Numer: 30040

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
$ 0.184	$/kWh blended		0.000420205	30,120	$ 24,685	$ 15,259	$ -
$ 0.134	$/kWh supply	134,115	0.000420205				
$ 8.47	$/kW	78.3	0				
$ 1.11	$/Therm	13,815	0.00533471				
$ -	$/kgals	-	0				
$ -	$/Gal	-					

Forest Glen Elementary School

Recommend? Y or N		Item	Savings kW	kWh	therms	No. 2 Oil gal	Water kgal	$	Cost	Simple Payback	Life Expectancy	Equivalent CO2 (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings kW	kWh	therms	kgal/yr	$	ROI	NPV	IRR
N	ECM-1	Replace single pane windows with energy efficient double pane windows	0.0	0	2,429	0	0	2,684	$ 353,800	131.8	25	13.0	$ -	N	131.8	0.0	0	60,725	0	$ 67,101	(0.8)	($307,062)	-10.1%
Y	ECM-2	Add condensing boiler	0.0	0	5,512	0	0	6,090	$ 189,287	31.1	25	29.4	$ 2,500	N	30.7	0.0	0	137,789	0	$ 152,257	(0.2)	($80,736)	-1.5%
N	ECM-3	Replace motors	0.2	422	0	0	0	72	$ 2,231	31.1	18	0.2	$ 153	N	28.9	2.7	7,596	0	0	$ 1,672	(0.3)	($1,091)	-4.6%
Y	ECM-4	Install window ac unit controllers	0.0	3,445	0	0	0	634	$ 1,200	1.9	20	1.4	$ -	N	1.9	0.0	68,900	0	0	$ 12,678	9.6	$8,231	52.8%
N	ECM-L1	Lighting Replacements / Upgrades	25	46,162	0	0	0	8,757	$ 67,283	7.7	15	19.4	$ 11,350	N	6.4	379.5	692,423	0	0	$ 165,978	1.5	$48,609	13.2%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0	7,669		0	0	1,411	$ 4,104	2.9	15	3.2	$ 640	N	2.5	0.0	115,035	0	0	$ 21,166	4.2	$13,382	40.5%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	25	48,206	0	0	0	9,031	$ 71,387	7.9	15	20.3	$ 11,990	N	6.6	379.5	723,090	0	0	$ 171,621	1.4	$48,416	12.7%
		Total	**25.5**	**52,073**	**7,941**	**0**	**0**	**$ 18,511**	**$ 617,905**	**33.4**	**20.6**	**64**	**$ 14,643**		**32.6**	**382**	**799,586**	**198,514**	**-**	**$ 405,328**	**(0.3)**	**($332,243)**	**-4.3%**
		Recommended Measures (highlighted green above)	**25.3**	**51,651**	**5,512**	**0**	**0**	**$ 15,755**	**$ 261,874**	**16.6**	**20.0**	**51**	**$ 14,490**	**0**	**15.7**	**380**	**791,990**	**137,789**	**-**	**$ 336,555**	**0.3**	**($24,090)**	**2.4%**
		% of Existing	**32%**	**39%**	**40%**	**0%**	**0**																

	City:	Newark, NJ
	Occupied Hours/Week	168

Temp	Enthalpy h (Btu/lb)	Bin Hours	Building Operating Hours	Auditorium Occupied Hours	Gymnasium Occupied Hours	Library Occupied Hours	Classrooms Occupied Hours
102.5							
97.5	35.4	6	6	0	0	0	0
92.5	37.4	31	31	0	0	0	0
87.5	35.0	131	131	0	0	0	0
82.5	33.0	500	500	0	0	0	0
77.5	31.5	620	620	0	0	0	0
72.5	29.9	664	664	0	0	0	0
67.5	27.2	854	854	0	0	0	0
62.5	24.0	927	927	0	0	0	0
57.5	20.3	600	600	0	0	0	0
52.5	18.2	730	730	0	0	0	0
47.5	16.0	491	491	0	0	0	0
42.5	14.5	656	656	0	0	0	0
37.5	12.5	1,023	1,023	0	0	0	0
32.5	10.5	734	734	0	0	0	0
27.5	8.7	334	334	0	0	0	0
22.5	7.0	252	252	0	0	0	0
17.5	5.4	125	125	0	0	0	0
12.5	3.7	47	47	0	0	0	0
7.5	2.1	34	34	0	0	0	0
2.5	1.3	1	1	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)	1.3

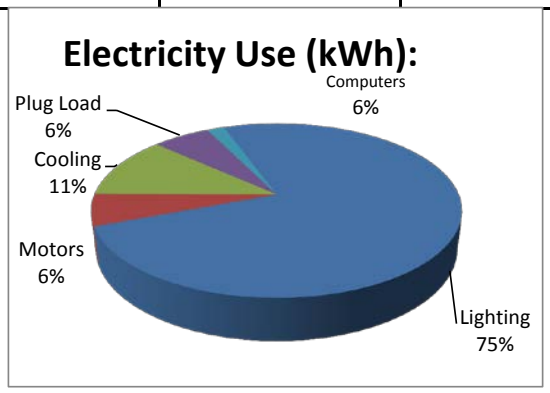
Heating		
Hours	4,427	Hrs
Weighted Avg	40	F
Avg	28	F

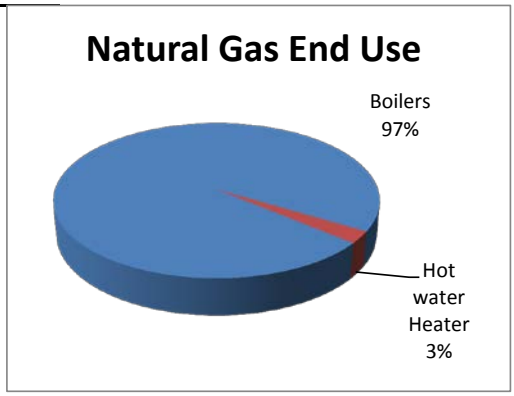
Cooling		
Hours	4,333	Hrs
Weighted Avg	68	F
Avg	78	F

Bloomfield School District - LGEA
CHA Project Numer: 30040
Forest Glen Elementary School

Utility End Use Analysis

Electricity Use (kWh):		Notes/Comments:	
134,115	Total	Based on utility analysis	
100,309	Lighting	From Lighting Calculations	75%
8,000	Motors	Estimated	6%
15,406	Cooling	Estimated from AC equipment	11%
8,000	Plug Load	Estimated	6%
2,400	Computers	Estimated	2%
			0%
Natural Gas Use (Therms):		**Notes/Comments:**	
13,815	Total	Based on utility analysis	
13,465	Boilers		97%
350	Hot water Heater		
			100%





Bloomfield School District - LGEA
CHA Project Numer: 30040
Forest Glen Elementary School

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

ECM-1 Replace single pane windows with energy efficient double pane windows

Existing: The building has old steel frame single pane windows which lead to large amount of the heating/cooling loss. Replacing these old windows with high heat resistence double pane windows will help reduce the energy loss and save energy. Grond and third floors have double pane windows.
Proposed: Replace single pane windows with double windows.

Linear Feet of panel Edge	960.0	LF	Cooling System Efficiency	0	kW/ton	Heating System Efficiency	80%	
Area of Panel	2,340.0	SF	Ex Occupied Clng Temp.	72	*F	Heating On Temp.	60	*F
Existing Infiltration Factor	**0.50**	**cfm/LF**	Ex Unoccupied Clng Temp.	72	*F	Ex Occupied Htg Temp.	72	*F
Proposed Infiltration Factor	**0.40**	**cfm/LF**	Cooling Occ Enthalpy Setpoint	27.5	Btu/lb	Ex Unoccupied Htg Temp.	72	*F
Existing U Value	**1.00**	**Btuh/SF/*F**	Cooling Unocc Enthalpy Setpoint	27.5	Btu/lb	Electricity	$ 0.184	$/kWh
Proposed U Value	**0.60**	**Btuh/SF/*F**				Natural Gas	$ 1.11	$/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	-120,186	-120,186	-81,875	-81,875	0	0	0	0
97.5	42.5	6	2	4	-92,070	-92,070	-61,722	-61,722	0	0	0	0
92.5	39.5	45	16	29	-73,890	-73,890	-49,518	-49,518	0	0	0	0
87.5	36.6	146	52	94	-55,926	-55,926	-37,487	-37,487	0	0	0	0
82.5	34.0	298	106	192	-38,610	-38,610	-25,974	-25,974	0	0	0	0
77.5	31.6	476	170	306	-21,726	-21,726	-14,807	-14,807	0	0	0	0
72.5	29.2	662	237	426	-4,842	-4,842	-3,640	-3,640	0	0	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	41,447	41,447	26,371	26,371	0	0	380	242
52.5	18.7	668	239	430	55,739	55,739	35,465	35,465	0	0	466	296
47.5	16.2	659	235	424	70,031	70,031	44,559	44,559	0	0	577	367
42.5	14.4	685	245	441	84,323	84,323	53,652	53,652	0	0	722	460
37.5	12.6	739	264	475	98,615	98,615	62,746	62,746	0	0	911	580
32.5	10.7	717	256	461	112,907	112,907	71,839	71,839	0	0	1,012	644
27.5	8.6	543	194	349	127,199	127,199	80,933	80,933	0	0	864	550
22.5	6.8	318	114	205	141,491	141,491	90,027	90,027	0	0	563	358
17.5	5.5	245	88	158	155,783	155,783	99,120	99,120	0	0	477	304
12.5	4.1	156	56	100	170,075	170,075	108,214	108,214	0	0	332	211
7.5	2.6	92	33	59	184,367	184,367	117,307	117,307	0	0	212	135
2.5	1.0	36	13	23	198,659	198,659	126,401	126,401	0	0	89	57
-2.5	0.0	19	7	12	212,951	212,951	135,495	135,495	0	0	51	32
-7.5	-1.5	8	3	5	227,243	227,243	144,588	144,588	0	0	23	14
TOTALS		**8,760**	**3,129**	**5,631**					0	0	**6,679**	**4,250**

Existing Panel Infiltration	**480**	**cfm**	
Existing Panel Heat Transfer	**2,340**	**Btuh/*F**	
Proposed Panel Infiltration	**384**	**cfm**	
Proposed Panel Heat Transfer	**1,404**	**Btuh/*F**	

Savings	**2,429**	**Therms**	**$**	**2,685**
	0	**kWh**	**$**	**-**
			$	**2,685**

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	15	26	6	960.0	2340.0	0.5	1	480.0	2340.0
Total		**15**	**26**	**6**	**960.0**	**2,340.0**	**0.50**	**1.00**	**480.0**	**2340.0**

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-1 - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Window Replacement	2,340	sqft	$ 65	$ 40	$ -	$152,100	$ 93,600	$ -	$ 245,700	Vendor Est per SF

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

$ 245,700	Subtotal
$ 49,140	20% Contingency
$ 58,968	20% Contractor O&P
$ -	0% Engineering Fees
$ 353,800	**Total**

Bloomfield School District - LGEA
CHA Project Numer: 30040
Forest Glen Elementary School

ECM-2 Add condensing boiler

Description: This ECM evaluates adding a condensing boiler to supplement the existing Kewanee hot water boiler to work as the main boiler. The existing hot water boiler is over 50 years old and has lived its useful life. Apart from savings in energy, savings will also be made on additional maintenance material costs and man hours incurred on account of high maintenance of old boiler.

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 1.11	/ Therm	Natural Gas
Baseline Fuel Cost		/ Gal	
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	2,479,000	btu/hr	Estimated Boiler Load % and Capacity
Heating Combustion Efficiency	75%		Estimated efficiency of existing hot water boiler
Heating Degree-Day	2,783	Degree-day	From National Climate Data Center for Newark, NJ
Design Temperature Difference	57	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	2,500,000	btu/hr	
Efficiency	92%		Efficiency of new hot water boiler
SAVINGS			
Fuel Savings	5,512	therms	NJ Protocols Calculation
Fuel Cost Savings	$ 6,090		

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

Algorithms

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

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

Bloomfield School District - LGEA
CHA Project Numer: 30040
Forest Glen Elementary School

ECM-2 - 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.		
2,500 MBH NG Condensing HW Boile	1	EA	$ 50,000	$ 25,000		$ 51,350	$ 31,150	$ -	$ 82,500	Estimated
Flue Installation	1	LS	$ 7,500.0	$3,500.00		$ 7,703	$ 4,361	$ -	$ 12,064	Estimated
Controls	1	EA	$ 3,000.0	$ 500.00		$ 3,081	$ 623	$ -	$ 3,704	Estimated
Electrical	1	LS	$ 3,000	$ 2,000		$ 3,081	$ 2,492	$ -	$ 5,573	Estimated
piping	1	LS	$ 15,000	$ 5,000		$ 15,405	$ 6,230	$ -	$ 21,635	Estimated
Miscellaneous GC work	1	EA	$ 5,000	$ 5,000		$ 5,135	$ 6,230	$ -	$ 11,365	
Crane	1	EA			$ 3,000	$ -	$ -	$ 3,372	$ 3,372	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

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

$ 140,213	Subtotal
$ 49,074	35% Contingency
$ 189,287	**Total**

Bloomfield School District - LGEA
CHA Project Numer: 30040
Forest Glen Elementary School

ECM-3 Replace motors

Description: This ECM evaluates the electrical savings associated with replacing less efficient electric motors with NEMA standard MG-1 rated motors

Demand Cost
$/kW-month
$ 6.47

Energy Cost
$/kWh
$ 0.13

Multipliers		
Material	Labor	Equipment
1.03	1.25	1.12

Savings Analysis

Cost Estimates

#	Description	Location	Existing HP	Load Factor	Coincidence Factor	IF_{VFD} Y/N	IF_{VFD} Factor	Existing Efficiency$_a$	New Efficiency$_a$	ΔkW kW	Demand Savings	Demand Savings $	Annual Hours	kWh Savings	$ kWh Savings	Total $ Savings	Estimated Cost	Payback Years	Unit Costs Materials	Unit Costs Labor	Unit Costs Equipment	Subtotal Costs Materials	Subtotal Costs Labor	Subtotal Costs Equipment	Total Cost	Remarks
1	Hot Water Pump	Boiler Room	3	0.75	0.74	N	1.0	0.865	0.895	0.1	0.064	$ 7	2,745	179	$ 24	$ 30	$ 876	28.8	$ 550	$ 250	$ -	$ 565	$ 312	$ -	$ 876	
2	Hot Water Pump	Boiler Room	3	0.75	0.74	N	1.0	0.865	0.895	0.1	0.064	$ 7	2,745	179	$ 24	$ 30	$ 876	28.8	$ 550	$ 250	$ -	$ 565	$ 312	$ -	$ 876	
3	H&V Unit	Multi Purpose Room	1	0.75	0.74	N	1.0	0.825	0.855	0.0	0.023	$ 2	2,745	65	$ 9	$ 11	$ 478	42.9	$ 284	$ 150	$ -	$ 291	$ 187	$ -	$ 478	
4				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
5				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
6				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
7				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
8				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
9				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
10				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
11				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
12				0.75	0.74		1.0			0.0	0.000	$ -	2,745	-	$ -	$ -	$ -	n/a	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
		Total	7							0.2	0.15	$ 15		422	$ 57	$ 72	$ 2,231									

Notes

a Existing and new efficiencies should be entered if known. If not known, use provided curve fit based on "DOE Survey Installed Average" and NEMA Premium values, respectively.

b Same as existing HP unless resized to better match load

Bloomfield School District - LGEA
CHA Project Numer: 30040
Forest Glen Elementary School

EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (btu/h)
Window AC Units	Offices, Staff Room, Library and Nurse	72,000

Total btu/h of all window A/C Units: *72,000* *btu/h*

4

ECM-4 **Install window ac unit controllers**

ECM Description : Window A/C units are currently controlled manually by the occupants and are not turned off when the room is unoccupied. This ECM evaluates implementation of a digital timer device that will automatically turn the window A/C unit off at a preset time .

ASSUMPTIONS			Comments
Electric Cost	$0.184	/ kWh	
Average run hours per Week	80	Hours	
Space Balance Point	55	F	
Space Temperature Setpoint	72	deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	72,000	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	10.0		
Existing Annual Electric Usage	6,693	kWh	

Item	Value	Units	Comments
Proposed Annual Electric Usage	3,248	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Electrical Usage Savings	3,445	kWh
Annual Cost Savings	$634	
Total Project Cost	$1,200	
Simple Payback	2	years

OAT - DB Bin Temp F	Annual Hours	**Existing Hours of Operation**	Proposed % of time of operation	**Proposed hrs of Operation**
102.5	0	0	100%	0
97.5	6	3	89%	3
92.5	31	15	79%	12
87.5	131	62	68%	43
82.5	500	238	58%	138
77.5	620	295	47%	140
72.5	664	316	37%	116
67.5	854	0	0%	0
62.5	927	0	0%	0
57.5	600	0	0%	0
52.5	730	0	0%	0
47.5	491	0	0%	0
42.5	656	0	0%	0
37.5	1,023	0	0%	0
32.5	734	0	0%	0
27.5	334	0	0%	0
22.5	252	0	0%	0
17.5	125	0	0%	0
12.5	47	0	0%	0
7.5	34	0	0%	0
2.5	1	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0

Total	8,760	**930**	49%	**451**

Bloomfield School District - LGEA
CHA Project Numer: 30040
Forest Glen Elementary School

ECM-4 - 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.		
						0	$ -	$ -	$ -	
Window AC Controller	6	EA	$ 150	$ -	$ -	924.3	$ -	$ -	$ 924	Estimated
						$ -	$ -	$ -	$ -	

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

$ 924	Subtotal
$ 324	35% Contingency
$ 1,200	**Total**

Bloomfield School District - LGEA
CHA Project Numer: 30040
Forest Glen 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)	30,120
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)	$24,685	$15,259
Existing Usage (from utility)	134,115	13,815
Proposed Savings	51,651	5,512
Existing Total MMBtus	1,839	
Proposed Savings MMBtus	727	
% Energy Reduction	**39.6%**	
Proposed Annual Savings	$15,755	

	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	$5,682	$6,889	$12,571
Incentive #3	$5,682	$6,889	$12,571
Total All Incentives	**$11,363**	**$13,779**	**$30,142**

Total Project Cost	$261,874

		Allowable Incentive
% Incentives #1 of Utility Cost*	12.5%	$5,000
% Incentives #2 of Project Cost**	4.8%	$12,571
% Incentives #3 of Project Cost**	4.8%	$12,571
Total Eligible Incentives***	**$30,142**	
Project Cost w/ Incentives	$231,732	

Project Payback (years)	
w/o Incentives	w/ Incentives
16.6	14.7

* 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 Bloomfield Schools - Forest Glen ES
CHA Project No.30040
Existing Lighting & Audit Input

Cost of Electricity: **$0.184** **$/kWh**
$8.47 **$/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
196LED	Classroom 2	Classrooms	15	W 32 C F 4 (ELE)	F44ILL	112	1.68	SW	1400	2,352	OCC	
196LED	Classroom 3	Classrooms	15	W 32 C F 4 (ELE)	F44ILL	112	1.68	SW	1400	2,352	OCC	
196LED	Classroom 5	Classrooms	15	W 32 C F 4 (ELE)	F44ILL	112	1.68	SW	1400	2,352	OCC	
196LED	Classroom 6	Classrooms	15	W 32 C F 4 (ELE)	F44ILL	112	1.68	SW	1400	2,352	OCC	
196LED	Conference Room	Offices	6	W 32 C F 4 (ELE)	F44ILL	112	0.67	SW	2600	1,747	OCC	
111	Hallways	Offices	33	W 34 C F 1 (MAG)	F41EE	43	1.42	SW	2600	3,689	NONE	
70	Hallways	Offices	33	W 32 C F 1	F41LL	32	1.06	SW	2600	2,746	NONE	
196LED	Classroom 1	Classrooms	21	W 32 C F 4 (ELE)	F44ILL	112	2.35	SW	1400	3,293	OCC	
246	Restroom	Restroom	1	W96CF1 (MAG)	F81EHS	83	0.08	SW	1400	116	OCC	
65	Restroom	Restroom	2	I 100	I100/1	100	0.20	SW	1400	280	OCC	
196LED	Store	Storage Areas	1	W 32 C F 4 (ELE)	F44ILL	112	0.11	SW	1040	116	OCC	
77	Book Room	Classrooms	3	I 150	I150/1	150	0.45	SW	1400	630	OCC	
168	Classroom 4	Classrooms	14	W 40 C F 2 (MAG)	F42SS	94	1.32	SW	1400	1,842	OCC	
46	Classroom 4	Classrooms	1	W 32 C F 2 (ELE)	F42LL	60	0.06	SW	1400	84	OCC	
65	Restroom	Restroom	14	I 100	I100/1	100	1.40	SW	1400	1,960	OCC	
46	Principal	Offices	3	W 32 C F 2 (ELE)	F42LL	60	0.18	SW	2600	468	OCC	
65	Vault	Storage Areas	2	I 100	I100/1	100	0.20	SW	1040	208	OCC	
65	Restroom	Restroom	1	I 100	I100/1	100	0.10	SW	1400	140	OCC	
196LED	Main Office	Offices	6	W 32 C F 4 (ELE)	F44ILL	112	0.67	SW	2600	1,747	OCC	
65	Main Office	Offices	2	I 100	I100/1	100	0.20	SW	2600	520	OCC	
77	Copy Room	Offices	1	I 150	I150/1	150	0.15	SW	2600	390	OCC	
65	Store	Storage Areas	2	I 100	I100/1	100	0.20	SW	1040	208	OCC	
196LED	Nurse	Offices	4	W 32 C F 4 (ELE)	F44ILL	112	0.45	SW	2600	1,165	OCC	
65	Restroom	Restroom	2	I 100	I100/1	100	0.20	SW	1400	280	OCC	
65	Store	Storage Areas	1	I 100	I100/1	100	0.10	SW	1040	104	OCC	
111	Restroom	Restroom	2	W 34 C F 1 (MAG)	F41EE	43	0.09	SW	1400	120	OCC	
65	Restroom	Restroom	4	I 100	I100/1	100	0.40	SW	1400	560	OCC	
65	Lobby	Offices	30	I 100	I100/1	100	3.00	SW	2600	7,800	NONE	
70	Hallways	Offices	6	W 32 C F 1	F41LL	32	0.19	SW	2600	499	NONE	
269	Greenhouse	Offices	2	CFS40	CFS40/1	40	0.08	SW	2600	208	OCC	
146LED	All Purpose Room	Kitchen	28	High Bay MH 400	MH400/1	458	12.82	SW	2000	25,648	OCC	
65	H&V Unit Room	Storage Areas	1	I 100	I100/1	100	0.10	SW	1040	104	OCC	
65	Store	Storage Areas	1	I 100	I100/1	100	0.10	SW	1040	104	OCC	
196LED	Classroom 11	Classrooms	15	W 32 C F 4 (ELE)	F44ILL	112	1.68	SW	1400	2,352	OCC	
196LED	Classroom 7	Classrooms	15	W 32 C F 4 (ELE)	F44ILL	112	1.68	SW	1400	2,352	OCC	
196LED	Classroom 8	Classrooms	15	W 32 C F 4 (ELE)	F44ILL	112	1.68	SW	1400	2,352	OCC	
196LED	Classroom 9	Classrooms	15	W 32 C F 4 (ELE)	F44ILL	112	1.68	SW	1400	2,352	OCC	
28	Restroom	Restroom	2	CR 40 C F 1 (MAG)	FC16/1	35	0.07	SW	1400	98	OCC	
65	Restroom	Restroom	8	I 100	I100/1	100	0.80	SW	1400	1,120	OCC	
146LED	Stage	Storage Areas	6	High Bay MH 400	MH400/1	458	2.75	SW	1040	2,858	OCC	
65	Office	Offices	2	I 100	I100/1	100	0.20	SW	2600	520	OCC	
46	Store	Storage Areas	3	W 32 C F 2 (ELE)	F42LL	60	0.18	SW	1040	187	OCC	
65	Garage	Storage Areas	4	I 100	I100/1	100	0.40	SW	1040	416	OCC	
111	Hallways	Offices	1	W 34 C F 1 (MAG)	F41EE	43	0.04	SW	2600	112	OCC	
74	Janitor's Closet	Janitor's Closet	2	I 50	I50/1	50	0.10	SW	1092	109	OCC	
168	Hallways	Offices	15	W 40 C F 2 (MAG)	F42SS	94	1.41	SW	2600	3,666	OCC	
196LED	Staff Room	Offices	8	W 32 C F 4 (ELE)	F44ILL	112	0.90	SW	2600	2,330	OCC	
65	Restroom	Restroom	4	I 100	I100/1	100	0.40	SW	1400	560	OCC	
65	Boiler Room	Gymnasium	8	I 100	I100/1	100	0.80	SW	3000	2,400	OCC	
74	Boiler Room	Gymnasium	1	I 50	I50/1	50	0.05	SW	3000	150	OCC	
196LED	Kitchen	Kitchen	4	W 32 C F 4 (ELE)	F44ILL	112	0.45	SW	2000	896	OCC	
168	Kitchen	Kitchen	5	W 40 C F 2 (MAG)	F42SS	94	0.47	SW	2000	940	OCC	
187	Storage	Storage Areas	4	W 34 C F 4 (MAG)	F44EE	144	0.58	SW	1040	599	OCC	
46	Custodian	Offices	1	W 32 C F 2 (ELE)	F42LL	60	0.06	SW	2600	156	OCC	
65	Storage	Storage Areas	2	I 100	I100/1	100	0.20	SW	1040	208	OCC	
14	Storage	Storage Areas	2	CIRC 32/40 C F 2 (MAG)	FC32/40/1	80	0.16	SW	1040	166	OCC	
65	Restroom	Restroom	4	I 100	I100/1	100	0.40	SW	1400	560	OCC	
196LED	Classroom 12	Classrooms	7	W 32 C F 4 (ELE)	F44ILL	112	0.78	SW	1400	1,098	OCC	
65	Storage	Storage Areas	2	I 100	I100/1	100	0.20	SW	1040	208	OCC	
65	Exterior	Outdoor Lighting	9	I 100	I100/1	100	0.90	SW	3640	3,276	OCC	
74	Exterior	Outdoor Lighting	10	I 50	I50/1	50	0.50	SW	3640	1,820	OCC	
160	Exterior	Outdoor Lighting	1	B 34 C F 2	F42EE	72	0.07	SW	3640	262	OCC	
	Total		**462**				**54.66**			**100,309**		

Energy Audit of Bloomfield Schools - Forest Glen ES
CHA Project No.30040
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
196LED	Classroom 2	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	SW	1,400	1,050	1,302	0.9	$ 334.09	$ 3,543.75	$750	10.6	8.4
196LED	Classroom 3	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	SW	1,400	1,050	1,302	0.9	$ 334.09	$ 3,543.75	$750	10.6	8.4
196LED	Classroom 5	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	SW	1,400	1,050	1,302	0.9	$ 334.09	$ 3,543.75	$750	10.6	8.4
196LED	Classroom 6	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	SW	1,400	1,050	1,302	0.9	$ 334.09	$ 3,543.75	$750	10.6	8.4
196LED	Conference Room	6	W 32 C F 4 (ELE)	F44ILL	112	0.7	SW	2600	1,747	6	T 74 R LED	RTLED50	50	0.3	SW	2,600	780	967	0.4	$ 215.77	$ 1,417.50	$300	6.6	5.2
111	Hallways	33	W 34 C F 1 (MAG)	F41EE	43	1.4	SW	2600	3,689	33	W 28 C F 1	F41SSILL	26	0.9	SW	2,600	2,231	1,459	0.6	$ 325.40	$ 3,341.25	$0	10.3	10.3
70	Hallways	33	W 32 C F 1	F41LL	32	1.1	SW	2600	2,746	33	W 32 C F 1	F41LL	32	1.1	SW	2,600	2,746	-	0.0	$ -	$ -	$0		#DIV/0!
196LED	Classroom 1	21	W 32 C F 4 (ELE)	F44ILL	112	2.4	SW	1400	3,293	21	T 74 R LED	RTLED50	50	1.1	SW	1,400	1,470	1,823	1.3	$ 467.73	$ 4,961.25	$1,050	10.6	8.4
246	Restroom	1	W96CF1 (MAG)	F81EHS	83	0.1	SW	1400	116	1	W96CF1 (MAG)	F81EHS	125	0.1	SW	1,400	175	(59)	(0.0)	$ (15.09)	$ -	$0		0.0
65	Restroom	2	I 100	I100/1	100	0.2	SW	1400	280	2	CF 26	CFQ26/1-L	27	0.1	SW	1,400	76	204	0.1	$ 52.45	$ 81.00	$0	1.5	1.5
196LED	Store	1	W 32 C F 4 (ELE)	F44ILL	112	0.1	SW	1040	116	1	T 74 R LED	RTLED50	50	0.1	SW	1,040	52	64	0.1	$ 18.17	$ 236.25	$50	13.0	10.3
77	Book Room	3	I 150	I150/1	150	0.5	SW	1400	630	3	CF 26	CFQ26/1-L	27	0.1	SW	1,400	113	517	0.4	$ 132.56	$ 20.25	$0	0.2	0.2
168	Classroom 4	14	W 40 C F 2 (MAG)	F42SS	94	1.3	SW	1400	1,842	14	W 28 C F 2	F42SSILL	48	0.7	SW	1,400	941	902	0.6	$ 231.35	$ 3,780.00	$0	16.3	16.3
46	Classroom 4	1	W 32 C F 2 (ELE)	F42LL	60	0.1	SW	1400	84	1	W 32 C F 2 (ELE)	F42LL	60	0.1	SW	1,400	84	-	0.0	$ -	$ -	$0		#DIV/0!
65	Restroom	14	I 100	I100/1	100	1.4	SW	1400	1,960	14	CF 26	CFQ26/1-L	27	0.4	SW	1,400	529	1,431	1.0	$ 367.14	$ 567.00	$0	1.5	1.5
46	Principal	3	W 32 C F 2 (ELE)	F42LL	60	0.2	SW	2600	468	3	W 32 C F 2 (ELE)	F42LL	60	0.2	SW	2,600	468	-	0.0	$ -	$ -	$0		#DIV/0!
65	Vault	2	I 100	I100/1	100	0.2	SW	1040	208	2	CF 26	CFQ26/1-L	27	0.1	SW	1,040	56	152	0.1	$ 42.78	$ 81.00	$0	1.9	1.9
65	Restroom	1	I 100	I100/1	100	0.1	SW	1400	140	1	CF 26	CFQ26/1-L	27	0.0	SW	1,400	38	102	0.1	$ 26.22	$ 40.50	$0	1.5	1.5
196LED	Main Office	6	W 32 C F 4 (ELE)	F44ILL	112	0.7	SW	2600	1,747	6	T 74 R LED	RTLED50	50	0.3	SW	2,600	780	967	0.4	$ 215.77	$ 1,417.50	$300	6.6	5.2
65	Main Office	2	I 100	I100/1	100	0.2	SW	2600	520	2	CF 26	CFQ26/1-L	27	0.1	SW	2,600	140	380	0.1	$ 84.69	$ 81.00	$0	1.0	1.0
77	Copy Room	1	I 150	I150/1	150	0.2	SW	2600	390	1	CF 26	CFQ26/1-L	27	0.0	SW	2,600	70	320	0.1	$ 71.34	$ 6.75	$0	0.1	0.1
65	Store	2	I 100	I100/1	100	0.2	SW	1040	208	2	CF 26	CFQ26/1-L	27	0.1	SW	1,040	56	152	0.1	$ 42.78	$ 81.00	$0	1.9	1.9
196LED	Nurse	4	W 32 C F 4 (ELE)	F44ILL	112	0.4	SW	2600	1,165	4	T 74 R LED	RTLED50	50	0.2	SW	2,600	520	645	0.2	$ 143.85	$ 945.00	$200	6.6	5.2
65	Restroom	2	I 100	I100/1	100	0.2	SW	1400	280	2	CF 26	CFQ26/1-L	27	0.1	SW	1,400	76	204	0.1	$ 52.45	$ 81.00	$0	1.5	1.5
65	Store	1	I 100	I100/1	100	0.1	SW	1040	104	1	CF 26	CFQ26/1-L	27	0.0	SW	1,040	28	76	0.1	$ 21.39	$ 40.50	$0	1.9	1.9
111	Restroom	2	W 34 C F 1 (MAG)	F41EE	43	0.1	SW	1400	120	2	W 28 C F 1	F41SSILL	26	0.1	SW	1,400	73	48	0.0	$ 12.21	$ 202.50	$0	16.6	16.6
65	Restroom	4	I 100	I100/1	100	0.4	SW	1400	560	4	CF 26	CFQ26/1-L	27	0.1	SW	1,400	151	409	0.3	$ 104.90	$ 162.00	$0	1.5	1.5
65	Lobby	30	I 100	I100/1	100	3.0	SW	2600	7,800	30	CF 26	CFQ26/1-L	27	0.8	SW	2,600	2,106	5,694	2.2	$ 1,270.29	$ 1,215.00	$0	1.0	1.0
70	Hallways	6	W 32 C F 1	F41LL	32	0.2	SW	2600	499	6	W 32 C F 1	F41LL	32	0.2	SW	2,600	499	-	0.0	$ -	$ -	$0		#DIV/0!
269	Greenhouse	2	CFS40	CFS40/1	40	0.1	SW	2600	208	2	CFS40	CFS40/1	40	0.1	SW	2,600	208	-	0.0	$ -	$ -	$0		#DIV/0!
146LED	All Purpose Room	28	High Bay MH 400	MH400/1	458	12.8	SW	2000	25,648	28	BAYLED78W	BAYLED78W	93	2.6	SW	2,000	5,208	20,440	10.2	$ 4,799.72	$ 23,637.47	$4,200	4.9	4.0
65	H&V Unit Room	1	I 100	I100/1	100	0.1	SW	1040	104	1	CF 26	CFQ26/1-L	27	0.0	SW	1,040	28	76	0.1	$ 21.39	$ 40.50	$0	1.9	1.9
65	Store	1	I 100	I100/1	100	0.1	SW	1040	104	1	CF 26	CFQ26/1-L	27	0.0	SW	1,040	28	76	0.1	$ 21.39	$ 40.50	$0	1.9	1.9
196LED	Classroom 11	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	SW	1,400	1,050	1,302	0.9	$ 334.09	$ 3,543.75	$750	10.6	8.4
196LED	Classroom 7	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	SW	1,400	1,050	1,302	0.9	$ 334.09	$ 3,543.75	$750	10.6	8.4
196LED	Classroom 8	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	SW	1,400	1,050	1,302	0.9	$ 334.09	$ 3,543.75	$750	10.6	8.4
	Total	**332**				**40.1**			**73,242**	**332**			**1,520**	**14.8**			**27,080**	**46,162**	**25.3**	**$11,065**	**$67,283**	**$11,350**		
																		Demand Savings		**25.3**	**$2,572**			

Energy Audit of Bloomfield Schools - Forest Glen ES
CHA Project No.30040
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	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.)	(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)	(kW Saved) * ($/kWh)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
196LED	Classroom 2	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	1.7	OCC	1400	2,352.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
196LED	Classroom 3	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	1.7	OCC	1400	2,352.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
196LED	Classroom 5	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	1.7	OCC	1400	2,352.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
196LED	Classroom 6	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	1.7	OCC	1400	2,352.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
196LED	Conference Room	6	W 32 C F 4 (ELE)	F44ILL	112	0.7	0.7	OCC	2080	1,397.8	349.4	0.0	$64.30	$128.25	$20.00	2.0	1.7
111	Hallways	33	W 34 C F 1 (MAG)	F41EE	43	1.4	1.4	NONE	2600	3,689.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70	Hallways	33	W 32 C F 1	F41LL	32	1.1	1.1	NONE	2600	2,745.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
196LED	Classroom 1	21	W 32 C F 4 (ELE)	F44ILL	112	2.4	2.4	OCC	1400	3,292.8	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
246	Restroom	1	W96CF1 (MAG)	F81EHS	83	0.1	0.1	OCC	980	81.3	34.9	0.0	$6.41	$128.25	$20.00	20.0	16.9
65	Restroom	2	I 100	I100/1	100	0.2	0.2	OCC	980	196.0	84.0	0.0	$15.46	$128.25	$20.00	8.3	7.0
196LED	Store	1	W 32 C F 4 (ELE)	F44ILL	112	0.1	0.1	OCC	728	81.5	34.9	0.0	$6.43	$128.25	$20.00	19.9	16.8
77	Book Room	3	I 150	I150/1	150	0.5	0.5	OCC	1400	630.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
168	Classroom 4	14	W 40 C F 2 (MAG)	F42SS	94	1.3	1.3	OCC	1400	1,842.4	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
46	Classroom 4	1	W 32 C F 2 (ELE)	F42LL	60	0.1	0.1	OCC	1400	84.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
65	Restroom	14	I 100	I100/1	100	1.4	1.4	OCC	980	1,372.0	588.0	0.0	$108.19	$128.25	$20.00	1.2	1.0
46	Principal	3	W 32 C F 2 (ELE)	F42LL	60	0.2	0.2	OCC	2080	374.4	93.6	0.0	$17.22	$128.25	$20.00	7.4	6.3
65	Vault	2	I 100	I100/1	100	0.2	0.2	OCC	728	145.6	62.4	0.0	$11.48	$128.25	$20.00	11.2	9.4
65	Restroom	1	I 100	I100/1	100	0.1	0.1	OCC	980	98.0	42.0	0.0	$7.73	$128.25	$20.00	16.6	14.0
196LED	Main Office	6	W 32 C F 4 (ELE)	F44ILL	112	0.7	0.7	OCC	2080	1,397.8	349.4	0.0	$64.30	$128.25	$20.00	2.0	1.7
65	Main Office	2	I 100	I100/1	100	0.2	0.2	OCC	2080	416.0	104.0	0.0	$19.14	$128.25	$20.00	6.7	5.7
77	Copy Room	1	I 150	I150/1	150	0.2	0.2	OCC	2080	312.0	78.0	0.0	$14.35	$128.25	$20.00	8.9	7.5
65	Store	2	I 100	I100/1	100	0.2	0.2	OCC	728	145.6	62.4	0.0	$11.48	$128.25	$20.00	11.2	9.4
196LED	Nurse	4	W 32 C F 4 (ELE)	F44ILL	112	0.4	0.4	OCC	2080	931.8	233.0	0.0	$42.86	$128.25	$20.00	3.0	2.5
65	Restroom	2	I 100	I100/1	100	0.2	0.2	OCC	980	196.0	84.0	0.0	$15.46	$128.25	$20.00	8.3	7.0
65	Store	1	I 100	I100/1	100	0.1	0.1	OCC	728	72.8	31.2	0.0	$5.74	$128.25	$20.00	22.3	18.9
111	Restroom	2	W 34 C F 1 (MAG)	F41EE	43	0.1	0.1	OCC	980	84.3	36.1	0.0	$6.65	$128.25	$20.00	19.3	16.3
65	Restroom	4	I 100	I100/1	100	0.4	0.4	OCC	980	392.0	168.0	0.0	$30.91	$128.25	$20.00	4.1	3.5
65	Lobby	30	I 100	I100/1	100	3.0	3.0	NONE	2600	7,800.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70	Hallways	6	W 32 C F 1	F41LL	32	0.2	0.2	NONE	2600	499.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
269	Greenhouse	2	CFS40	CFS40/1	40	0.1	0.1	OCC	2080	166.4	41.6	0.0	$7.65	$128.25	$20.00	16.8	14.1
146LED	All Purpose Room	28	High Bay MH 400	MH400/1	458	12.8	12.8	OCC	1600	20,518.4	5,129.6	0.0	$943.85	$128.25	$20.00	0.1	0.1
65	H&V Unit Room	1	I 100	I100/1	100	0.1	0.1	OCC	728	72.8	31.2	0.0	$5.74	$128.25	$20.00	22.3	18.9
65	Store	1	I 100	I100/1	100	0.1	0.1	OCC	728	72.8	31.2	0.0	$5.74	$128.25	$20.00	22.3	18.9
196LED	Classroom 11	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	1.7	OCC	1400	2,352.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
196LED	Classroom 7	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	1.7	OCC	1400	2,352.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
196LED	Classroom 8	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	1.7	OCC	1400	2,352.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
	Total	**332**				**40.1**	**40.1**			**65,572.72**	**7,668.96**	**0.0**	**1411.1**	**4104.0**	**640.0**		
										Demand Savings			**0.0**	**$0**			

Energy Audit of Bloomfield Schools - Forest Glen ES
CHA Project No.30040
ECM-L3 Lighting Replacements with Occupancy Sensors

		EXISTING CONDITIONS							RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures No. of fixtures before the retrofit	Standard Fixture Code Lighting Fixture Code	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control Pre-Inst. control device	Annual Hours Estimated daily hours for the usage group	Annual kWh (kW/space) * (Annual Hours)	Number of Fixtures No. of fixtures after the retrofit	Standard Fixture Code Lighting Fixture Code	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control Retrofit control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/space) * (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual $ Saved (kWh Saved) * ($/kWh)	Retrofit Cost Cost for renovations to lighting system	NJ Smart Start Lighting Incentive Prescriptive Lighting Measures	Simple Payback With Out Incentive Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered
196LED	Classroom 2	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	OCC	1,400	1,050	1,302	0.9	$ 334.09	$ 3,672.00	$ 770	11.0	8.7
196LED	Classroom 3	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	OCC	1,400	1,050	1,302	0.9	$ 334.09	$ 3,672.00	$ 770	11.0	8.7
196LED	Classroom 5	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	OCC	1,400	1,050	1,302	0.9	$ 334.09	$ 3,672.00	$ 770	11.0	8.7
196LED	Classroom 6	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	OCC	1,400	1,050	1,302	0.9	$ 334.09	$ 3,672.00	$ 770	11.0	8.7
196LED	Conference Room	6	W 32 C F 4 (ELE)	F44ILL	112	0.7	SW	2600	1,747	6	T 74 R LED	RTLED50	50	0.3	OCC	2,080	624	1,123	0.4	$ 244.48	$ 1,545.75	$ 320	6.3	5.0
111	Hallways	33	W 34 C F 1 (MAG)	F41EE	43	1.4	SW	2600	3,689	33	W 28 C F 1	F41SSILL	26	0.9	NONE	2,600	2,231	1,459	0.6	$ 325.40	$ 3,341.25	$ -	10.3	10.3
70	Hallways	33	W 32 C F 1	F41LL	32	1.1	SW	2600	2,746	33	W 32 C F 1	F41LL	32	1.1	NONE	2,600	2,746	-	0.0	$ -	$ -	$ -		
196LED	Classroom 1	21	W 32 C F 4 (ELE)	F44ILL	112	2.4	SW	1400	3,293	21	T 74 R LED	RTLED50	50	1.1	OCC	1,400	1,470	1,823	1.3	$ 467.73	$ 5,089.50	$ 1,070	10.9	8.6
246	Restroom	1	W96CF1 (MAG)	F81EHS	83	0.1	SW	1400	116	1	W96CF1 (MAG)	F81EHS	125	0.1	OCC	980	123	(6)	(0.0)	$ (5.43)	$ 128.25	$ 20		
65	Restroom	2	I 100	I100/1	100	0.2	SW	1400	280	2	CF 26	CFQ26/1-L	27	0.1	OCC	980	53	227	0.1	$ 56.62	$ 209.25	$ 20	3.7	3.3
196LED	Store	1	W 32 C F 4 (ELE)	F44ILL	112	0.1	SW	1040	116	1	T 74 R LED	RTLED50	50	0.1	OCC	728	36	80	0.1	$ 21.04	$ 364.50	$ 70	17.3	14.0
77	Book Room	3	I 150	I150/1	150	0.5	SW	1400	630	3	CF 26	CFQ26/1-L	27	0.1	OCC	1,400	113	517	0.4	$ 132.56	$ 148.50	$ 20	1.1	1.0
168	Classroom 4	14	W 40 C F 2 (MAG)	F42SS	94	1.3	SW	1400	1,842	14	W 28 C F 2	F42SSILL	48	0.7	OCC	1,400	941	902	0.6	$ 231.35	$ 3,908.25	$ 20	16.9	16.8
46	Classroom 4	1	W 32 C F 2 (ELE)	F42LL	60	0.1	SW	1400	84	1	W 32 C F 2 (ELE)	F42LL	60	0.1	OCC	1,400	84	-	0.0	$ -	$ 128.25	$ 20		
65	Restroom	14	I 100	I100/1	100	1.4	SW	1400	1,960	14	CF 26	CFQ26/1-L	27	0.4	OCC	980	370	1,590	1.0	$ 396.36	$ 695.25	$ 20	1.8	1.7
46	Principal	3	W 32 C F 2 (ELE)	F42LL	60	0.2	SW	2600	468	3	W 32 C F 2 (ELE)	F42LL	60	0.2	OCC	2,080	374	94	0.0	$ 17.22	$ 128.25	$ 20	7.4	6.3
65	Vault	2	I 100	I100/1	100	0.2	SW	1040	208	2	CF 26	CFQ26/1-L	27	0.1	OCC	728	39	169	0.1	$ 45.88	$ 209.25	$ 20	4.6	4.1
65	Restroom	1	I 100	I100/1	100	0.1	SW	1400	140	1	CF 26	CFQ26/1-L	27	0.0	OCC	980	26	114	0.1	$ 28.31	$ 168.75	$ 20	6.0	5.3
196LED	Main Office	6	W 32 C F 4 (ELE)	F44ILL	112	0.7	SW	2600	1,747	6	T 74 R LED	RTLED50	50	0.3	OCC	2,080	624	1,123	0.4	$ 244.48	$ 1,545.75	$ 320	6.3	5.0
65	Main Office	2	I 100	I100/1	100	0.2	SW	2600	520	2	CF 26	CFQ26/1-L	27	0.1	OCC	2,080	112	408	0.1	$ 89.85	$ 209.25	$ 20	2.3	2.1
77	Copy Room	1	I 150	I150/1	150	0.2	SW	2600	390	1	CF 26	CFQ26/1-L	27	0.0	OCC	2,080	56	334	0.1	$ 73.93	$ 135.00	$ 20	1.8	1.6
65	Store	1	I 100	I100/1	100	0.2	SW	1040	208	2	CF 26	CFQ26/1-L	27	0.1	OCC	728	39	169	0.1	$ 45.88	$ 209.25	$ 20	4.6	4.1
196LED	Nurse	4	W 32 C F 4 (ELE)	F44ILL	112	0.4	SW	2600	1,165	4	T 74 R LED	RTLED50	50	0.2	OCC	2,080	416	749	0.2	$ 162.99	$ 1,073.25	$ 220	6.6	5.2
65	Restroom	2	I 100	I100/1	100	0.2	SW	1400	280	2	CF 26	CFQ26/1-L	27	0.1	OCC	980	53	227	0.1	$ 56.62	$ 209.25	$ 20	3.7	3.3
65	Store	1	I 100	I100/1	100	0.1	SW	1040	104	1	CF 26	CFQ26/1-L	27	0.0	OCC	728	20	84	0.1	$ 22.94	$ 168.75	$ 20	7.4	6.5
111	Restroom	2	W 34 C F 1 (MAG)	F41EE	43	0.1	SW	1400	120	2	W 28 C F 1	F41SSILL	26	0.1	OCC	980	51	69	0.0	$ 16.23	$ 330.75	$ 20	20.4	19.1
65	Restroom	4	I 100	I100/1	100	0.4	SW	1400	560	4	CF 26	CFQ26/1-L	27	0.1	OCC	980	106	454	0.3	$ 113.24	$ 290.25	$ 20	2.6	2.4
65	Lobby	30	I 100	I100/1	100	3.0	SW	2600	7,800	30	CF 26	CFQ26/1-L	27	0.8	NONE	2,600	2,106	5,694	2.2	$ 1,270.29	$ 1,215.00	$ -	1.0	1.0
70	Hallways	6	W 32 C F 1	F41LL	32	0.2	SW	2600	499	6	W 32 C F 1	F41LL	32	0.2	NONE	2,600	499	-	0.0	$ -	$ -	$ -		
269	Greenhouse	2	CFS40	CFS40/1	40	0.1	SW	2600	208	2	CFS40	CFS40/1	40	0.1	OCC	2,080	166	42	0.0	$ 7.65	$ 128.25	$ 20	16.8	14.1
146LED	All Purpose Room	28	High Bay MH 400	MH400/1	458	12.8	SW	2000	25,648	28	BAYLED78W	BAYLED78W	93	2.6	OCC	1,600	4,166	21,482	10.2	$ 4,991.38	$ 23,765.72	$ 4,220	4.8	3.9
65	H&V Unit Room	1	I 100	I100/1	100	0.1	SW	1040	104	1	CF 26	CFQ26/1-L	27	0.0	OCC	728	20	84	0.1	$ 22.94	$ 168.75	$ 20	7.4	6.5
65	Store	1	I 100	I100/1	100	0.1	SW	1040	104	1	CF 26	CFQ26/1-L	27	0.0	OCC	728	20	84	0.1	$ 22.94	$ 168.75	$ 20	7.4	6.5
196LED	Classroom 11	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	OCC	1,400	1,050	1,302	0.9	$ 334.09	$ 3,672.00	$ 770	11.0	8.7
196LED	Classroom 7	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	OCC	1,400	1,050	1,302	0.9	$ 334.09	$ 3,672.00	$ 770	11.0	8.7
196LED	Classroom 8	15	W 32 C F 4 (ELE)	F44ILL	112	1.7	SW	1400	2,352	15	T 74 R LED	RTLED50	50	0.8	OCC	1,400	1,050	1,302	0.9	$ 334.09	$ 3,672.00	$ 770	11.0	8.7
S	**Total**	**332**				**40.1**			**73,242**	**332**				**14.8**			**25,036**		**25.3**	**11,442**	**71,387**	**$11,990**		
S																	**Demand Savings**			**25.3**	**$2,572**			
S																	**kWh Savings**			**48,206**	**$8,870**			

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

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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

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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,

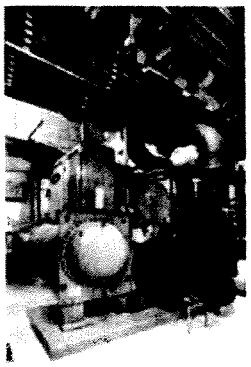
III. PAY FOR PERFORMANCE (P4P)

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

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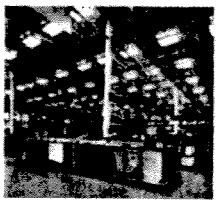
Pay for Performance incentives are awarded upon the satisfactory completion of three p milestones:

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.

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

BPU New Jersey Board of Public Utilities

PAY FOR PERFORMANCE APPLICATION FORM

July 1, 2014 – June 30, 2015

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 for all accounts, organized in chronological order and separated by account. Utilize Utility Tool for applications with multiple accounts to organize data.
6. Provide brief description of facility, noting any special or unusual circumstances and/or site conditions.
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

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

ADMINISTRATOR – New Jersey Board of Public Utilities (NJBPU)

APPLICATION PROCESS – The Program pays incentives in phases upon satisfactory completion of each of three Program milestones - approval of a complete Energy Reduction Plan, installation of all recommended measures per the Energy Reduction Plan, completion of Post-Construction Benchmarking Report (for incentive amounts, please refer to Incentive Amounts). In order to be eligible for Program Incentives,a Participating Customer or an agent authorized by a Customer, must submit to the Market Manager a properly completed application package – application form, Participating Customer's company W-9, twelve consecutive months of the project's utility bills and executed Participation Agreement. All components of the application package must be filled out completely, truthfully and accurately. This application package must be received on or before June 30, 2015 in order to be eligible for the Fiscal Year 2015 Incentives. The Market Manager will review the application package to determine if the project is eligible for a Program Incentive. When approved, the Participating Customer will receive an approval letter from their Case Manager with the estimated authorized first incentive amount and the date by which the Energy Reduction Plan must be submitted. Upon receipt of the approval letter, the Participating Customer and Partner may proceed with work on the Energy Reduction Plan. The Market Manager or agent thereof 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 Energy Reduction Plan approval letter. 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.

CHANGES TO THE PROGRAM – The Program and Participation Agreements may be changed by the Market Manager at any time without notice. Approved applications, however, will be processed to completion under the agreements in effect at the time of the Market Manager's approval.

ELIGIBILITY - Program Incentives are available to existing commercial, industrial and certain multifamily buildings with peak kilowatt demand usage of more than 100 kW in any of the most recent preceding twelve months of utility bills and a customer of the New Jersey Utilities. Market Manager has the discretion to approve applications that fall below the 100 kW minimum by no more than 10%. If the Participant is a municipal electric company customer, and a customer of an investor-owned gas New Jersey Utility, only gas measures will be eligible for incentives under the Program. Similarly, if the Participant is an oil/propane customer and a customer of an investor-owned electric New Jersey Utility, only electricity measures will be eligible for incentives under the Program.

Equipment procured by participating Customer through another program offered by the New Jersey Utilities, as applicable, is not eligible for incentives through this Program. Customers who, from July 1, 2013 – June 30, 2014, have not contributed to the Societal benefits Charge of the applicable New Jersey Utility may not be eligible for incentives offered through this program.

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

ENERGY-EFFICIENT MEASURES – Any device eligible to receive a Program Incentive payment through the New Jersey's Clean Energy Commercial and Industrial Program. The total package of measures as presented in the Energy Reduction Plan must have at least a 10% internal rate of return (IRR).

ENERGY REDUCTION PLAN – A document created by the Participating Customer's selected Partner that defines several key aspects of the project including (but not limited to) existing conditions as a result of a whole-building technical analysis, benchmarking summaries, recommended measures, financing plan and implementation schedule.

ENERGY REDUCTION PLAN APPROVAL – After application approval, the Participating Customer and Partner must work together to finalize and submit an Energy Reduction Plan which incorporates a work scope that will achieve the minimum 15% reduction in source energy performance target in accordance with the Program rules and policies along with the Benchmarking Tool, modeling software file, a copy of the executed Partner and Participating Customer contract, an original copy of the executed Installation Agreement and a Request for Incentive #1 Payment form. All components of the submittal package must be filled out completely, truthfully and accurately. The Market Manager, agents thereof and/or the selected Partner must be provided reasonable access to the Participating Customer's facility, staff, tenants and/or others necessary to develop an Energy Reduction Plan that will achieve the minimum 15% performance target as well as the necessary utility billing data as dictated by the Program. The Energy Reduction Plan submittal package will be reviewed and must be approved by the Market Manager prior to payment of Incentive #1. Upon approval of the submittal package, the Customer will receive an Incentive #1 approval letter indicating the date by which all measures in the Energy Reduction Plan must be installed (no later than twelve months following the Energy Reduction Plan submittal approval date).

INCENTIVE AMOUNTS – Incentive #1 - $0.10 per square foot of the project with a maximum amount of $50,000 and minimum of $5,000, not to exceed 50% of the project's annual energy cost and contingent on installation of measures in the Energy Reduction Plan and receipt of a signed Installation Agreement. If installation does not commence within the required timeframe, Incentive #1 may be required to be returned to the program. In the event the project is cancelled and Incentive #1 is not returned, the project may reapply to the program in the future but another Incentive #1 will not be paid. Incentive #2 – 50% of the total performance-based incentive (combination of Incentives #2 and #3) calculated per Program's incentive structure; Incentive #3 – remaining amount based on the realized energy savings of the project. For customers that have successfully participated in the Local Government Energy Audit Program, Incentive #1 will be reduced by 50% to $0.05 per square foot up to $25,000. Actual Incentive #1 paid shall not be higher than 5% over the committed amount. Actual Incentive #2 paid shall not be higher than the committed amount, unless the Energy Reduction Plan has been resubmitted due to changes in the work scope. Actual Incentive #3 paid shall be higher or lower than the committed amount based on actual energy savings but shall not be greater than program Incentive Caps.

The Market Manager will provide incentives according to those described in this section or as modified upon notice to Participating Customer. All incentive payments are paid directly to the Participating Customer or the Participating Customer's designee as indicated on the application form. The Program is not bound to pay any incentive unless the submittal package associated with the incentive payment is approved by the Market Manager who reserves the sole discretion of approving or disapproving the submittal packages.

INCENTIVE CAP – Program Incentives #2 and #3 will be capped not to exceed 50% of the total actual project cost. Incentive #1 will be capped not to exceed 50% of the project's annual energy cost. The Market Manager reserves the right to limit the amount of the Program Incentives (Incentive #1, #2 and #3) to $1M per gas and electric account (limited to $2M per project) in a program year. Campus style facilities, which are mastered-metered, are subject to the annual incentive cap of $1 million per gas and electric account. The Participating Customer will also be subject to an annual Entity Cap of $4M (Definition of an Entity can be found in the Board Order Docket No. EO07030203).

INSTALLATION AGREEMENT – The Participating Customer must submit an executed Installation Agreement as part of the Request for Incentive #1 Form. By executing the Installation Agreement, the Customer agrees to install all of the measures in the Energy Reduction Plan, which are estimated to result in meeting or exceeding the minimum 15% performance target. The Customer agrees to the performance-based incentives (Incentives #2 & #3) as indicated in the document which are based on the results of the Energy Reduction Plan. Implementation of the measures must commence in the time period twelve months following the approval date of the Energy Reduction Plan. Failure to complete the installation of the measures in the Energy Reduction Plan may result in the repayment of Incentive #1. In the event the project is cancelled and Incentive #1 is not returned, the project may reapply to the program in the future but another Incentive #1 will not be paid.

LIMITATION OF LIABILITY – By virtue of participating in this Program, Participating Customers agree to waive any and all claims or damages against TRC Energy Services, the Market Manager, and the Administrator, except the receipt of the Program Incentive. Participating Customers agree that the Market Manager's and Administrator's liability, in connection with this Program, is limited to paying the Program Incentive specified. Under no circumstances shall the Market 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 Market Manager under this Program shall be individual, and not joint and/or several.

The Market Manager's review and approval of the Energy Reduction Plan cannot be construed to be a determination as to performance, applicability, dollar savings, energy savings, or any other aspect of the proposed project. The Market Manager and Administrator offer no guarantee or warranty of performance of the project's equipment or system. The participant assumes full responsibility and liability for the installation of all equipment, including but not limited to design, specification, all permits, installation, maintenance, performance and financing. By participating in the program and accepting incentive dollars, you agree to hold harmless the Market Manager and Administrator and their respective staffs with respect to the Project

MARKET MANAGER – TRC Energy Services is responsible for managing the New Jersey Clean Energy Commercial & Industrial Programs.

MEASUREMENT & VERIFICATION APPROVAL – Twelve months subsequent to the Incentive #2 Payment Submittal package submission date, measurement and verification of the projected energy reduction will be conducted by the Participating Customer's Partner using the project's post-installation utility data (supplied by the Customer). The Participating Customer must work with their Partner to submit the Incentive #3 Payment Submittal, consisting of the Post-Construction Benchmarking Pay For Performance-Existing Buildings Report, Benchmarking Tool, and Request for Incentive #3 form. All components of the submittal package must be filled out

completely, truthfully and accurately. Upon review of the submittal package (by the Market Manager or agent thereof), the remaining 50% of the total performance-based incentive (Incentives #2 & #3) will be released to the Participating Customer. If the Post-Construction Benchmarking Report indicates that the project did not meet the minimum performance target, the post-installation completion period may be extended to up to twenty-four months subsequent to the Incentive Payment #2 package submission date. Upon approval of the submittal package, the Customer will receive an Incentive #3 Submittal approval letter indicating successful completion of the program.

NEW JERSEY UTILITIES – The investor-owned 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.

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

PARTICIPATING CUSTOMER'S CERTIFICATION – Participating Customer agrees that all information is true and that he/she has conformed to all of the Program and equipment requirements per the Program Guidelines. Participating Customer certifies that he/she purchased and installed the equipment listed in the Energy Reduction Plan at their defined New Jersey project location.

PARTNER– An approved professional who provides technical building performance services to Participating Customers, acting as their "energy efficiency expert". Participating Customers are required to hire an approved Pay for Performance Partner to develop the Energy Reduction Plan and facilitate installation of the recommended package of Energy-Efficient Measures. Participants are required to enter into a contractual agreement with a selected Partner which outlines the set of minimum services the Partner will provide to the Participating Customer throughout the life of the project. It is strongly recommended that Participating Customers perform due diligence in selecting a Pay for Performance Partner. Fees charged by the Partner are not regulated by the Program and could vary between Partners.

PERFORMANCE-BASED INCENTIVES – The combination of Incentives #2 and #3, which are based on the projected and actual energy reduction performance of the project.

PERFORMANCE TARGET – A minimum of a 15% annual source energy savings performance target must be achieved in order to participate. The performance target is based on reducing the total energy consumption for the facility. No more than 50% of the total source energy savings may be derived from lighting measures. The total energy savings may not come from a single measure. A 4% performance target may be offered to customers whose annual energy consumption is heavily weighted to manufacturing and process loads. This approach will be reviewed on a case-by-case basis and must be pre-approved by the Market Manager. In order to be considered, the project must involve: A manufacturing facility, including such industries as plastics and packaging, chemicals, petrochemicals, metals, paper and pulp, transportation, biotechnology, pharmaceutical, food and beverage, mining and mineral processing, general manufacturing, equipment manufacturers and data centers; and manufacturing and/or process-related loads, including data center consumption, consume 50% or more of total facility energy consumption. No more than 50% of the total source energy savings may be derived from non-investor owned utilities or fuels.

POST-INSTALLATION APPROVAL – After the complete installation of all measures in the Energy Reduction Plan, the Customer and their Partner must finalize and submit the Incentive #2 Payment Submittal, consisting of the Installation Report, invoices, and Request for Incentive #2 Payment form. All components of the submittal package must be filled out completely, truthfully and accurately. Upon review of the submittal package and verification of the complete installation of all measures in the Energy Reduction Plan (via inspection by the Market Manager or agent thereof), 50% of the total performancebased incentive (Incentives #2 & #3) will be released to the Participating Customer. Upon approval of the submittal package, the Customer will receive an Incentive #2 approval letter indicating the date by which the post-installation Measurement & Verification phase began and will end (twelve months in length).

The Market Manager reserves the right to verify sales transactions and to have reasonable access to Participating Customer's facility to inspect both pre-existing products 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 the service territory of one of the New Jersey Utilities (as defined by the Program) as designated on the Participating Customer's Pay for Performance application. Program Incentives are available for qualified Energy-Efficient Measures as listed and described in the Program Guidelines. The Participating Customer must ultimately own the equipment, either through an up-front purchase or at the end of a short-term lease.

PRE-INSTALLED MEASURES - An Energy Reduction Plan must be approved by the program and an approval letter sent to the customer in order for incentives to be committed. Upon receipt of an Energy Reduction Plan, all project facilities must be preinspected. Measures installed prior to pre-inspection of the facility shall not be included as part of the ERP scope of work and will not be eligible for incentives. Measure installation undertaken prior to ERP approval, but after pre-inspection, is done at the customer's own risk. In the event that an Energy Reduction Plan is rejected by the program, the customer will not receive any incentives.

PRODUCT INSTALLATION OR EQUIPMENT INSTALLATION – Installation of the Energy-Efficient Measures.

Projects with a contract threshold of $15,444 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 – New Jersey's Clean Energy Pay for Performance Program offered herein by the New Jersey Board of Public Utilities pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq.

PROGRAM GUIDELINES – See Pay for Performance Program Guidelines available from your Partner.

PROGRAM INCENTIVES – Refers to the amount or level of incentive that the Program provides to participating customers pursuant to the Program offered herein (see the description under "Incentive Amount" heading).

PROGRAM OFFER – The Program covers products purchased and/or services rendered on or after July 1, 2014. Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities.

PROJECT – A commercial, industrial or multifamily existing building with peak demand in excess of 100 kW in any of the most recent preceding twelve months of electric usage. Multifamily building(s) must be four (4) stories or greater or three (3) stories and under having central heating, cooling, or metering serving more than one building. The 100 kW requirement is waived for the following customer classes: hospitals, non-profits (as defined by section 501(c)(3) of the Internal Revenue Code), public colleges and universities, local government entities, including K-12 schools, and affordable multifamily customers (defined as low income, subsidized, HUD, etc.)

TAX CLEARANCE CERTIFICATION – Businesses must apply for and receive a Tax Clearance Certificate from the New Jersey Division of Taxation before they can receive any incentive, grant or other financial assistance from the Program.

TAX LIABILITY – The Market 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 on the application form in addition to providing a copy of their W-9 form as part of the application package in order to receive a Program Incentive.

TERMINATION – New Jersey's Clean Energy Program reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this Program without prior or further notice.

WARRANTIES – THE MARKET MANAGER AND ADMINISTRATOR DO NOT WARRANT THE PERFORMANCE OF INSTALLED EQUIPMENT, AND/OR SERVICES RENDERED AS PART OF THIS PROGRAM, EITHER EXPRESSLY OR IMPLICITY. 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.

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 Market Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the Pay For Performance Program, including the release of electric and natural gas utility billing information, as well as make available to the public non-sensitive information. 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. This arrangement supersedes all other communications and representations.

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

Forest Glen Elementary School
CHA Project Numer: 30040

Cost of Electricity	$0.18	/kWh
Electricity Usage	134,115	kWh/yr
System Unit Cost	$4,000	/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
$272,000	**68.0**	**86,692**	**0**	**$15,951**	**0**	**$15,951**	**$0**	**$17,338**	**17.1**	**8.2**

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= $200 /1000kwh

Area Output*
938 m2
10,097 ft2

Perimeter Output*
1 m
3 ft

Available Roof Space for PV:
(Area Output - 10 ft x Perimeter) x 85%
8,557 ft2

Approximate System Size: Is the roof flat? (Yes/No) Yes

8 watt/ft2
68,453 DC watts
68 kW Enter into PV Watts

PV Watts Inputs***

Array Tilt Angle	20	Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)
Array Azimuth	180	Enter into PV Watts (default)
Zip Code	*07003	Enter into PV Watts
DC/AC Derate Factor	1.1	Enter info PV Watts

PV Watts Output
86,692 annual kWh calculated in PV Watts program

% Offset Calc

Usage	134,115	(from utilities)
PV Generation	86,692	(generated using PV Watts)
% offset	65%	

* http://www.freemaptools.com/area-calculator.htm
** http://www.flettexchange.com
*** 938

NREL

RESULTS

86,692 kWh per Year *

Month	Solar Radiation (kWh / m² / day)	AC Energy (kWh)	Energy Value ($)
January	2.78	5,120	378
February	3.52	5,793	428
March	4.34	7,702	568
April	4.95	8,204	605
May	5.69	9,468	699
June	5.86	9,196	679
July	5.73	9,180	677
August	5.47	8,688	641
September	4.91	7,761	573
October	3.99	6,741	497
November	2.68	4,580	338
December	2.35	4,259	314
Annual	4.36	86,692	$ 6,397

Location and Station Identification

Requested Location	280 Davey Street Bloomfield NJ 07003
Weather Data Source	(TMY2) NEWARK, NJ 6.0 mi
Latitude	40.7° N
Longitude	74.17° W

PV System Specifications *(Commercial)*

DC System Size	68 kW
Module Type	Standard
Array Type	Fixed (open rack)
Array Tilt	20°
Array Azimuth	180°
System Losses	14%
Inverter Efficiency	96%
DC to AC Size Ratio	1.1

Initial Economic Comparison

Average Cost of Electricity Purchased from Utility	0.07 $/kWh
Initial Cost	2.60 $/Wdc
Cost of Electricity Generated by System	0.13 $/kWh

Selected Incentives

Capacity Based Incentives (CBI)	New Jersey Renewable Energy Incentive Program Rate: $0.75 - Maximum Amount: $5,625.00

These values can be compared to get an idea of the cost-effectiveness of this system. However, system costs, system financing options (including 3rd party ownership) and complex utility rates can significantly change the relative value of the PV system.

APPENDIX F

Photos

FOREST GLEN ELEMENTARY SCHOOL

HOT WATER BOILER

HEAT TIMER CONTROL

PNEUMATIC SYSTEM CONTROL

HOT WATER PUMPS

ALL PURPOSE ROOM LIGHTS

ALL PURPOSE ROOM H&V UNIT

DHW HEATER

APPENDIX G

EPA Benchmarking Report

ENERGY STAR® Statement of Energy Performance

54

ENERGY STAR® Score[1]

Forest Glen Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 30,120
Built: 1957

For Year Ending: June 30, 2014
Date Generated: May 10, 2015

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
Forest Glen Elementary School 280 Davey Street Bloomfield, New Jersey 07003	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4420953

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
61.1 kBtu/ft²

Source EUI
95.9 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	1,381,500 (75%)
Electric - Grid (kBtu)	457,600 (25%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	63.4
National Median Source EUI (kBtu/ft²)	99.5
% Diff from National Median Source EUI	-4%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	135

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)