

POMPTON LAKES BOARD OF EDUCATION
LENOX ELEMENTARY SCHOOL
ENERGY ASSESSMENT

**FOR
NEW JERSEY
BOARD OF PUBLIC UTILITIES**

November 2012

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CHA PROJECT NO. 24698

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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 $\pm 20\%$, 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 school 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.

1.0 EXECUTIVE SUMMARY

This energy audit is performed by CHA in connection with the New Jersey Board of Public Utilities' Local Government Energy Audit Program for the Pompton Lakes Board of Education. The purpose of this report is to convey the findings of the energy audit to identify energy savings potential associated with major energy consumers and inefficient practices. This report details the results of the energy audit conducted for:

Building Name	Address	Square Feet	Construction Date
Lenox Elementary School	33 Lenox Avenue Pompton Lakes, NJ 07442	44,140	1918

The Energy Conservation Measures (ECMs) and Operations and Maintenance Measures (OMMs) identified in this report are energy savings potential that if implemented will allow the school to use electricity and gas more effectively and efficiently. These measures if pursued may qualify for the New Jersey SmartStart Buildings Program and/or Direct Install Program. Ultimately the goal of this audit and the implementation of these measures is to facilitate the State of New Jersey's green initiative by reducing emissions, using less energy and lowering operating costs. The measures recommended by CHA are typically less than a 10 year payback period, however under the New Jersey Energy Savings Improvement Plan, payback periods up to 15 years may be incentivized. If the recommended measures are implemented a total potential annual savings of \$47,000 may be realized with a payback period of 14 years.

The potential annual energy cost savings for each energy conservation measure (ECM) is shown in Table 1. Each measure's annual savings are dependent on that measure alone. A total annual savings from implementing multiple measures is not equivalent to the summation of all of the measure's savings because of the effects one measure has on another. A summary of the costs, savings, and paybacks for the recommended ECMs are detailed in Table 1 as follows:

Table 1: Summary of Energy Conservation Measures

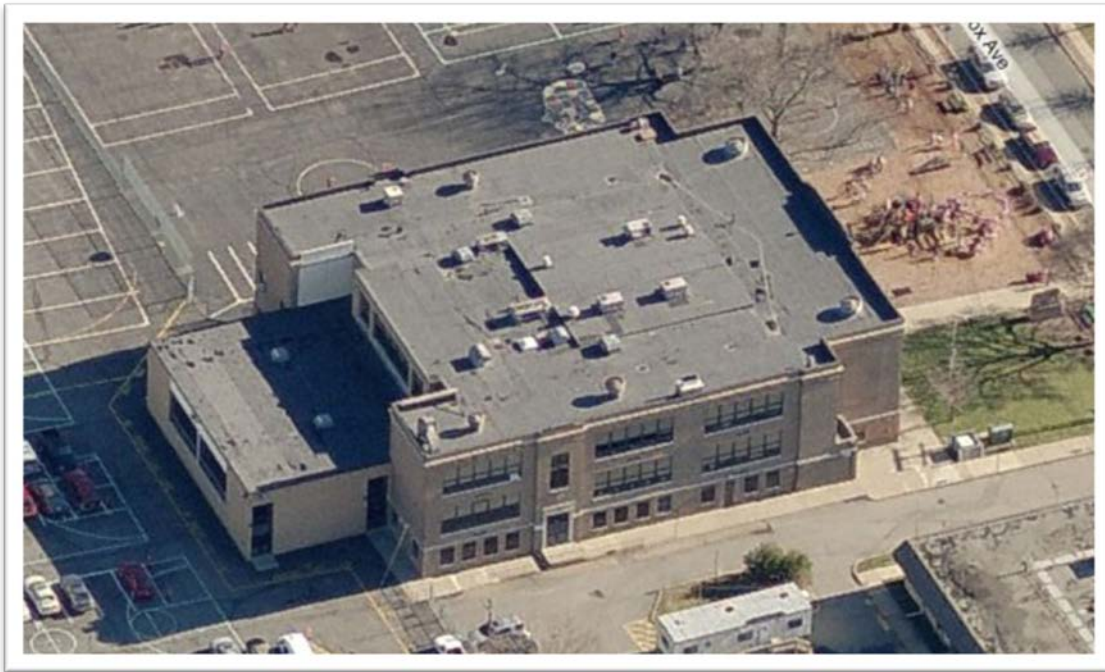
Summary of Energy Conservation Measures							
Energy Conservation Measure	Approx. Costs (\$)	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation	
ECM-1 Door & Window Seals	6,000	1,800	3	0	3	X	
ECM-2 Boiler Replacement	530,000	7,400	>20	6,000	>20	X	
ECM-3 Install DDC & BMS	302,000	4,400	>20	0	>20		
ECM-4 Lighting Replacement / Upgrades	67,000	8,700	8	35,200	4		
ECM-5 Install Lighting Controls (Occupancy Sensors)	14,000	6,300	2	9,900	1		
ECM-6 Lighting Replacements with Lighting Controls (Occupancy Sensors)	81,000	12,200	7	44,900	3	X	
ECM-7 Install Network Controller	2,000	1,300	2	0	2	X	
ECM-8 Install Low Flow Plumbing Fixtures	114,000	500	>20	0	>20		
ECM-9 Replace Electric Kitchen Equipment with Natural Gas Equipment	39,000	24,300	2	0	2	X	

2.0 INTRODUCTION AND BACKGROUND

The Lenox Elementary School is a 44,140 square foot building consisting of three floors. The building was constructed in 1916 with renovations performed in 1967 and 1998. The 1967 renovations included the addition of the all-purpose room and kitchen. The renovations also remodeled classrooms and updated lighting, windows and doors. Three classrooms were added to the third floor in 1998. The school includes the following spaces: classrooms, offices, multi-purpose room, kitchen, storage, toilet rooms and a media center. The school hours of operation are from 7:00 AM – 11:00 PM Monday through Friday, with various after-school activities and Saturdays 8:30AM to 4:00PM from January to March. The summer hours of operation are 7:00AM to 3:00PM Monday through Friday. The school has approximately 340 students and 75 faculty and staff members.

New Jersey's Clean Energy Program, funded by the New Jersey Board of Public Utilities, supports energy efficiency and sustainability for Municipal and Local Government Energy Audits. Through the support of a utility trust fund, New Jersey is able to assist state and local authorities in reducing energy consumption while increasing comfort.

Figure 1: Lenox Elementary School



3.0 UTILITY

Utilities include water, electricity and natural gas. Electricity is supplied and delivered by Jersey Central Power & Light. Natural gas is supplied and delivered by PSE&G.

For the 12-month period ending in August 2012, the utilities usage for the building was as follows:

Table 2: Actual Cost & Site Utility Usage

Electric		
Annual Usage	298,720	kWh/yr
Annual Cost	48,962	\$
Blended Rate	0.164	\$/kWh
Consumption Rate	0.135	\$/kWh
Demand Rate	6.56	\$/kW
Peak Demand	142.2	kW
Min. Demand	66.5	kW
Avg. Demand	110.8	kW
Natural Gas		
Annual Usage	20,493	Therms/yr
Annual Cost	20,303	\$
Rate	0.991	\$/Therms
Water		
Annual Usage	644,000	gallons/yr
Annual Cost	986	\$
Rate	1.532	\$/kgallon

Electrical usage was generally higher in the summer months when air conditioning equipment was operational. Natural gas consumption was higher in winter months for heating. See Appendix A for a detailed utility analysis.

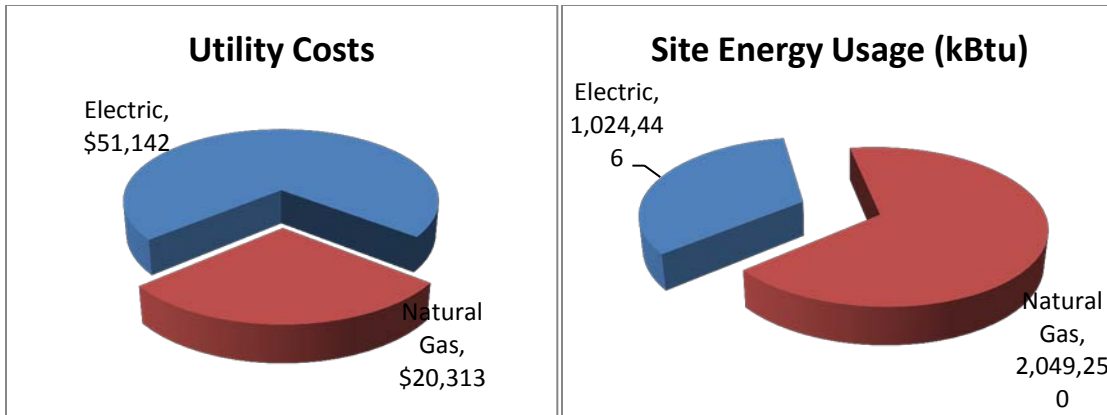


Figure 2: Annual Site Energy Usage

Figure 3: Annual Energy Cost

Under New Jersey’s energy deregulation law, the supply portion of the electric (or natural gas) bill is separated from the delivery portion. With the supply portion open to competition, customers can shop around for the best price on their energy supplies. Their electric and natural gas distribution utilities will still deliver those supplies through their wires and pipes – and respond to emergencies, should they arise – regardless of where those supplies are purchased. Purchasing your 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 your service. Additional information on selecting a third party energy supplier is available here: <http://www.state.nj.us/bpu/commercial/shopping.html>.

4.0 EXISTING CONDITIONS & AREAS OF ENERGY OPPORTUNITY

Energy conservation measures (ECM) are energy savings improvement recommendations that require a financial investment. These recommendations are justified by the energy and/or cost savings realized over time. Operational and maintenance measures (OMM) are low or no cost operational opportunities, which can be implemented to have positive impacts on overall building operation, comfort levels, or energy usage.

4.1 Building Envelope

The original building is built of concrete masonry units with brick veneer. The interior walls are block walls with painted plaster. There is currently no insulation in the walls of the original school. The third floor renovation completed in 1998 included the addition of three classrooms. These three classrooms have steel framing, with a masonry exterior, fiberglass insulation and drywall interior.

Windows and doors throughout the school building have been updated through the years. The majority of the windows are operable aluminum framed double glazing units. The windows seem to be in fair condition as examined during the site visit, but seals are unsatisfactory. The multipurpose room which serves as an auditorium, gymnasium and cafeteria has aluminum framed double glazing windows that are non-operable. The infiltration from these windows is significant.

The roof of the school building consists of a flat black rubber membrane roofing system with foam insulation tiles. During the site visit it was noted that the roof was in fair condition.

The following energy conservation measures were identified for building envelope improvements:

4.1.1 ECM-1 Replace Door & Window Seals

The seals around exterior doors and windows over time fail. This leads to unwanted infiltration of unconditioned outside air and exfiltration of conditioned air resulting in increased heating and cooling energy usage. This measure calls for the replacement of all exterior door and window seals.

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

ECM-1 Door & Window Seals

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	N. Gas Therms	Total \$						
\$					\$	\$		\$	Years	Years
6,000	0	0	1,800	1,800	0	1,800	0.4	0	3.3	3.3

Expected

Life: 5 years

Lifetime Savings: 0 kWh 9,000 therm s

\$9,000

* No incentives are available for this measure.

This measure is recommended.

4.2 HVAC Systems

Lenox Elementary school has (2) natural gas fired steam boilers; a Smith cast iron water tube boiler with a capacity of 3,600 Lbs/Hr, built in 1938 and a Superior Boiler Works fire tube boiler with a capacity of 1,674 Lbs/Hr, built in 1967. Both boilers are operational during the heating season. Steam is created to heat water up to 150°F-170°F through the means of a heat exchanger. Hot water provides heat in the school. The typical efficiency of the water tube boilers built in the 1930s is approximately 55% today and the typical efficiency of boilers built in the 1960s is approximately 65% today. The heating system efficiency is de-rated 5% because of the ineffectiveness of using a heat exchanger to create hot water from steam. The hot water is circulated through the building by five pumps: (1) 2 HP, (2) 1 ½ HP, (2) ¼ HP. The classrooms are heated by unit ventilators with hot water coils. The unit ventilators are controlled with pneumatic valves, dampers and actuators. These controls are not precise because of the age of the system.

The main offices, the media center and the third floor rooms are served by packaged rooftop units that have DX (direct expansion) cooling and duct-mounted hot water heating coils above the ceiling which distributes the conditioned air into the rooms. The faculty room has an indoor ventilating unit that cools the space with a condensing unit and heats the space with hot water heating coils. The multi-purpose room has hot water base board heating with exhaust fans and has an indoor ventilating unit. Room S309 has a condensing unit and room 209 has a window air conditioning unit. The majority of the school is not cooled.

The school's maintenance department has a maintenance contract with ACT and is very diligent about maintaining the HVAC equipment including scheduled filter changes.

Specifics on mechanical equipment can be found within the equipment inventory located in Appendix B.

The following ECMs were identified as HVAC system improvements:

4.2.1 ECM-2 Steam Boiler Replacement

The two natural gas fired steam boilers located in the boiler room have a combined capacity of 5,116,850 BTU with the 1938 Smith boiler having an efficiency of 50% and the 1967 Superior boiler having an efficiency of 60%. These boilers are past their service life which according to ASHRAE is 35 years. It is proposed to replace both existing steam boilers with new high efficiency natural gas fired condensing hot water boilers.

The high efficiency condensing hot water boilers have efficiencies between 90%-93% which would result in natural gas savings as the efficiency of the heating system increases. The savings calculations are based upon replacing the boilers with equal sized boilers. Additional savings may be recognized if the new boilers are sized per the system load. Further study is required to determine the system load and properly sized boilers.

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

ECM-2 Boiler Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	N. Gas Therms	Total \$						
\$	kWh	kW	Therms	\$	\$	\$	\$	Years	Years	
530,000	0	0	7,500	7,400	0	7,400	-0.5	75,000	>20	>20

Expected

Life: 25 years

Lifetime

Savings: 0 kWh 187,500 therms \$185,000

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities

This measure is recommended.

OMM-1 HVAC Unit Maintenance

Regular maintenance of HVAC units is necessary not only because it saves energy by keeping them operating at optimal efficiency, but also insures that the equipment does not fail. Some areas that reduce efficiency are: dirty condenser/evaporator coils, dirty filters and fan blades, air leaks and dirty heat transfer surfaces. Implementing a routine maintenance strategy will allow for better indoor air quality, increased efficiency and improved equipment life.

4.3 Control Systems

The building does not have a direct digital control system. The hydronic heating system including the classroom unit ventilators and the steam boilers utilize pneumatic controls. The system includes valves, actuators and dampers controlled through the use of a 5 horsepower air compressor. The pneumatic system is old and outdated, does not function correctly and has depreciated with age. The rooftop units have their own thermostats.

Typical set points range between 70 and 72 degrees Fahrenheit. There is no unoccupied set point and the school is heated continuously to 70-72°F during the heating season between November and April. The majority of the school is not cooled.

The following ECMs identified are improvements to the school’s HVAC control system:

4.3.1 ECM-3 Install Direct Digital Controls and Building Management System

Pneumatic control systems use compressed air as a medium to control HVAC equipment. This is accomplished by bleeding or draining the compressed air in the air lines going to the control devices such as sensors or thermostats to maintain a set line pressure. This in turn provides feedback in the loop to close or open dampers and actuators to meet the control set point. In addition to the age and inadequacies of the system, compressed air is an inefficient and expensive means of controlling a building’s HVAC system.

New direct digital control (DDC) systems use electrical signals to manage HVAC equipment. In combination with a building management system (BMS) which allows for trending, scheduling and remote control, the DDC and BMS system will save natural gas and electrical energy. The new system will be able to set a schedule for occupied and unoccupied setpoints as well as shutdown/startup of HVAC equipment. It will also eliminate the compressed air system including the air compressor and compressed air dryer.

Savings are seen from temperature scheduling for occupied and unoccupied hours and from the elimination of the air compressor.

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

ECM-3 Install DDC & BMS										
Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	N. Gas Therms	Total \$						
\$					\$	\$		\$		
302,000	2,500	0	3,700	4,400	0	4,400	-0.8	0	>20	>20

Expected Life: 16 years
 Lifetime Savings: 40,000 kWh 59,200 therms \$70,400

There are currently no incentives available for this measure.

This measure is not recommended.

4.4 Domestic Hot Water System

Lenox Elementary School has one domestic hot water heater located in the boiler room. The water heater is a Rheem Ruud Universal (G91-200) natural gas fired commercial domestic hot water heater with a capacity of 91 gallons with 80% efficiency and an input of 199,900 BTU. The domestic hot water heater serves the kitchen, toilet rooms and sinks located throughout the school.

4.5 Lighting/Electrical Systems

The majority of the lighting in the elementary school is T-12 fluorescent tube fixtures with magnetic ballasts and incandescent lamps. The multipurpose room is illuminated with T8 fluorescent high bay fixtures. The third floor addition has a fixture of T8 fluorescent fixtures with electronic ballasts and T-12 fluorescent fixtures with magnetic ballasts. The building exterior utilizes a 250W mercury vapor lamps. A comprehensive lighting survey can be found in Appendix B.

Lenox School utilizes 66 computers throughout the building in classrooms, offices, media centers and computer labs. All of the computers have flat screen LCD monitors.

The following ECMs identified are improvements to Lenox Elementary School's lighting and electrical system:

4.5.1 ECM-4 Lighting Replacement / Upgrades

The school mostly utilizes T-12 fluorescent fixtures. Compared to T-8s these bulbs consume more energy and are less efficient. The ballasts are magnetic as well. Each switch and circuit was identified, and the number of fixtures, locations, and existing wattage established (Appendix B). There is an opportunity to reduce consumption by upgrading the lighting fixtures to a super T-8 fixture and all incandescent fixtures to compact fluorescent lamps. The exterior lighting is proposed to be changed from mercury vapor to LED which has a longer life and consumes much less energy. To upgrade the T12 fixtures to super T8's the fixtures need to be re-lamped and re-ballasted and incandescent replacement only involves changing the bulbs to compact fluorescent bulbs. The exterior lighting would require a full fixture replacement to change to LED fixtures.

Energy savings for this measure were calculated by applying the existing and proposed fixture wattages to estimated times of operation. The difference between energy requirements resulted in a total annual savings of 50,139 kWh with an electrical demand reduction of about 20.5 kW. These calculations are based upon 1 to 1 replacements with the fixtures. They do not take into account lumen output and square footage. A more comprehensive study may be performed to determine correct lighting levels.

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

ECM-4 Lighting Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	N. Gas Therms	Total \$						
\$ 67,000	52,000	21.3	0	8,700	0	8,700	0.9	35,200	7.7	3.7

Expected Life: 15 years
 Lifetime Savings: 780,000 kWh 0 therms \$130,500

* Incentive shown is per the New Jersey Direct Install Program. See section 5.0 for other incentive opportunities

This measure is not recommended in lieu of ECM-6.

4.5.2 ECM-5 Install Lighting Controls (Occupancy Sensors)

Review of the comprehensive lighting survey determined that lighting in classrooms and various other spaces are typically operational, regardless of occupancy. Therefore, installing an occupancy sensor in these spaces to turn off lights when the areas are unoccupied was assessed.

This measure recommends installing occupancy sensors for the current lighting system. Using a process similar to that utilized in section 4.5.1, 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 difference between the two values resulted in an annual savings of 38,255 kWh.

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

ECM-5 Install Occupancy Sensors

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	N. Gas Therms	Total \$						
\$ 14,000	38,300	0	0	6,300	0	6,300	5.7	9,900	2.2	0.7

Expected Life: 15 years
 Lifetime Savings: 574,500 kWh 0 therms \$94,500

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities

This measure is not recommended in lieu of ECM-6.

4.5.3 ECM-6 Lighting Replacements with Controls (Occupancy Sensors)

This measure is a combination of ECM 4 and ECM 5; recommending to 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 calculated annual savings is 76,860 kWh with a demand reduction of 20.5 kW at a total of \$13,100.

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

ECM-6 Lighting Replacement with Occupancy Sensors

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Elect kW	N. Gas Therms	Total \$						
\$ 81,000	78,100	21.3	0	12,200	0	12,200	1.3	44,900	6.6	3.0

Expected

Life: 15 years

Lifetime

Savings: 1,171,500 kWh therms \$183,000

* Incentive shown is per the New Jersey Smart Start Program. See section 5.0 for other incentive opportunities

This measure is recommended.

4.5.4 ECM-7 Install Network Controller

There are approximately 66 computers in the Lenox school building. These computers are left on for the entire day. A network controller is a remote power management system controlled via the internet. The controller has the ability to reduce total energy draw when computers are not being used which will result in significant energy savings. An evaluation was performed for installing a computer network controller to reduce electrical energy draw from the computer network system when computers are not in use.

use, and number of fixtures. Replacing the existing plumbing fixtures in the school with 1.28 gpf toilets, 0.125 gpf urinals and 0.5 gpm faucets would save 300 KGal annually.

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

ECM-8 Install Low Flow Plumbing Fixtures

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	N. Gas Therms	Total \$						
\$ 114,000	0	0	400	500	0	500	-1.0	0	>20	>20

Expected Life: 15 years
 Lifetime Savings: 0 kWh 6,000 kGal \$7,500

* There is no incentive available for this ECM. See section 5.0 for other incentive opportunities.

This measure is not recommended.

OMM-3 Plumbing Upgrade Plan

Although ECM-8 is not recommended because of the long payback period, low flow plumbing fixtures are still beneficial energy efficient equipment. It is advised that the school implement a plumbing upgrade plan in which new low flow fixtures are installed as the older toilets, urinals and faucet aerators fail.

4.7 Kitchen Equipment

Cooking equipment for the kitchen within the school is all fueled by electricity. This includes the steam table, stove, oven, dishwasher, and dishwasher booster heater.

The following ECMs identified are improvements to Lenox Elementary School’s kitchen equipment:

4.7.1 ECM-9 Replace Electric Kitchen Equipment to Natural Gas

Lenox Elementary School uses a 24 kW heater for drying dishes, 25kW commercial double stack oven, 35kW range and a 42kW steam table. The school uses the equipment approximately 6 hours a day, 5 days a week, 38 weeks a year. Utilizing natural gas for these applications was assessed.

The calculation uses electrical consumption and annual electrical cost as the baseline, which was converted to natural gas for the proposed case. The difference between the two values is the energy savings.

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

ECM-9 Replace Electric Kitchen Equipment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	N. Gas Therms	Total \$						
\$ 29,000	142,500	100	-4,900	24,300	\$ 0	\$ 24,300	5.8	\$ 0	1.6	1.6

Expected

Life: 12 years

Lifetime

Savings: 1,710,000 kWh -58,800 therms \$291,600

* There is no incentive available for this ECM. See section 5.0 for other incentive opportunities.

This measure is recommended.

5.0 PROJECT INCENTIVES

5.1 Incentives Overview

5.1.1 New Jersey Pay For Performance Program

The facility will 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 for qualified energy conservation projects applied to facilities whose demand in any of the preceding 12 months exceeds 100 kW. This average minimum has been waived for buildings owned by local governments or municipalities and non-profit organizations, however. 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). 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).

- 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.

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

The table below shows the potential incentives available for the Lenox Elementary School through the Pay for Performance program:

	Incentives \$		
	Elec.	Gas	Total
Incentive #1	\$0	\$0	\$5,000
Incentive #2	\$20,955	-\$2,837	\$18,118
Incentive #3	\$20,955	-\$2,837	\$18,118
Total All Incentives	\$41,909	-\$5,674	\$41,235

The recommended ECM's yield an estimated annual savings that is greater than 15%, which makes this building eligible for incentives #1,2and 3 for the P4P program. Detailed calculations are found in appendix D.

5.1.2 New Jersey Smart Start Program

For this report, some energy conservation measures are applicable to the 2012 Smart Start Incentive Program and associated savings are included. This program provides incentives for pre-approved mechanical and electrical equipment replacements and pre-approved custom measures. The program includes a wide variety of incentives ranging from chillers and boilers, variable frequency drives, unitary HVAC equipment and lighting retrofits. Each incentive must be applied for and approved by the NJBPU (or corresponding utility program) prior to the installation of the equipment. Incentive payments are made to the owner after the equipment is fully installed and paid for.

5.1.3 Direct Install Program

The Direct Install Program targets small and medium sized facilities where the peak electrical demand does not exceed 150 kW 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 significantly reduce the implementation cost of energy conservation projects.

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 a Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy Website at <http://www.njcleanenergy.com>. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this document.

This building is eligible for the Direct Install Incentive since the annual demand is less than 150 KW. .

5.1.4 Energy Savings Improvement Plans (ESIP)

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” to pay for the capital costs of energy improvements to their facilities. This can be done over a maximum term of 15 years. Energy savings obligations 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 (see Appendix E). 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.

6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

6.1 Solar

6.1.1 Photovoltaic Rooftop Solar Power Generation

The school was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology uses solar cell arrays to 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 building's roof has sufficient room to install a large solar cell array. However, there is not sufficient room to size a system to meet the demand of the building. For this analysis we will consider a 90 KW system to help reduce usage.

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

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. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for a period of 15 years from the date of installation. The average SREC value per credit is estimated to be about \$60/ SREC per year based on current market data, and this number was utilized in the cash flow for this report.

The available roof area justifies the use of 90 kW PV solar array. The system costs for PV installations were derived from contractor budgetary pricing in the state of New Jersey for estimates of total cost of system installation. It should be noted that the cost of installation is currently about \$4.00 per watt or \$ 4,000 per kW of installed system, for a 50 kW system. Other cost considerations will also need to be considered. 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 need to be replaced multiple times during the useful life of the PV system.

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

Photovoltaic (PV) Rooftop Solar Power Generation – 90 kW System

Budgetary Cost	Annual Utility Savings				Total Savings	New Jersey Renewable Energy Incentive*	New Jersey Renewable SREC**	Payback (without incentive)	Payback (with incentives)
	Electricity		Natural Gas	Total					
\$	kW	kWh	Therms	\$	\$	\$	\$	Years	Years
360,000	90	117,300	0	19,237	19,237	0	7,038	18.7	13.7

* 30% federal tax credit

** Solar Renewable Energy Certificate Program (SREC) for 2012 is \$82/1000kwh

At 100 square feet per kW of PV panels (rule of thumb), the proposed PV power generation system would require 9,000 square feet of open space. However, it would also require a structural analysis of the existing roof to ensure that it can support the additional weight of the panels. Due to the current SRECs rates we do not recommend this measure at this time.

6.1.2 Solar Thermal Hot Water Plant

Active solar thermal systems use solar collectors to gather the sun's energy to heat water, another fluid, or air. An absorber in the collector converts the sun's energy into heat. The heat is then transferred by circulating water, antifreeze, or sometimes air to another location for immediate use or storage for later utilization. Applications for active solar thermal energy include providing hot water, heating swimming pools, space heating, and 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 around the site's latitude, to maximize the amount of radiation collected on a yearly basis.

Several options exist for using active solar thermal systems for space heating. The most common method involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system). The most practical system would transfer the heat from the panels to thermal storage tanks and transfer solar produced thermal energy to use for domestic hot water production. DHW is presently produced by gas-fired water heaters and, therefore, this measure would offer natural gas utility savings.

Currently, an incentive is not available for installation of thermal solar systems; a Federal tax credit of 30% of installation cost for the thermal applications is available. This measure is not recommended due to costs which drastically outweigh savings, as well as inadequate space for the necessary equipment.

This measure is not recommended.

7.0 EPA PORTFOLIO MANAGER

The EPA Portfolio Manager benchmarking tool was used to assess the building's energy performance. Portfolio Manager 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/ft²/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 an Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed measures, the Energy Star rating will increase.

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

Building	Site EUI kBtu/ft ² /yr	Source EUI Btu/ft ² /yr	Energy Star Rating (1-100)
Lenox Elementary School	71	127	47

The Lenox Elementary School has an below average Energy Star Rating of 47 (50% being the median). By implementing the measures discussed in this report, it is expected that the EUI can be reduced and the Energy Start score increased.

The Portfolio Manager account can be accessed by entering the username and password shown below at the login screen of the Portfolio Manager website (<https://www.energystar.gov/istar/pmpam/>). The account has been shared with the NYSERDABENCHMARKING master account.

Username: [REDACTED]
Password: [REDACTED]

A full EPA Energy Star Portfolio Manager Report is located in Appendix G.

8.0 CONCLUSIONS & RECOMMENDATIONS

The energy audit conducted by CHA at the Lenox Elementary School identified potential annual savings of \$46,800 may be realized for the recommended ECMs, with a summary of the costs, savings, and paybacks as follows:

ECM-1 Door & Window Seals

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
\$	kWh	kW	Therms	\$	\$	\$	\$	Years	Years	
6,000	0	0	1,800	1,800	0	1,800	0.4	0	3.3	3.3

ECM-2 Boiler Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
\$	kWh	kW	Therms	\$	\$	\$	\$	Years	Years	
530,000	0	0	7,500	7,400	0	7,400	-0.5	75,000	>20	>20

ECM-6 Lighting Replacement with Occupancy Sensors

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Elect	Nat Gas	Total						
\$	kWh	kW	Therms	\$	\$	\$	\$	Years	Years	
81,000	78,100	21.3	0	12,200	0	12,200	1.3	44,900	6.6	3.0

ECM-7 Install Network Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric	Electric	Nat Gas	Total						
\$	kWh	kW	Therms	\$	\$	\$	\$	Years	Years	
2,000	7,900	0	0	1,300	0	1,300	11.6	0	1.5	1.5

ECM-9 Replace Electric Kitchen Equipment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electri c kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
39,000	142,500	100	-4,900	24,300	0	24,300	5.8	0	1.8	1.8

APPENDIX A

Utility Usage Analysis and Alternate Suppliers List

Pompton Lakes Board of Education
237 Van Avenue, Pompton Lakes, NJ 07442

Annual Utilities
12-month Summary

Electric		
Annual Usage	298,720	kWh/yr
Annual Cost	48,962	\$
Blended Rate	0.164	\$/kWh
Consumption Rate	0.135	\$/kWh
Demand Rate	7.16	\$/kW
Peak Demand	142.2	kW
Min. Demand	66.5	kW
Avg. Demand	110.9	kW
Natural Gas		
Annual Usage	20,493	Therm/year
Annual Cost	20,303	\$
Rate	0.991	\$/Therm
Water		
Annual Usage	644,000	gallons/yr
Annual Cost	986	\$
Rate	1.531	\$/kgallon

Pompton Lakes Board of Education
237 Van Avenue, Pompton Lakes, NJ 07442

Utility Bills: Account Numbers

<u>Account Number</u>	<u>School Building</u>	<u>Location</u>	<u>Type</u>	<u>Notes</u>
100004429922	Lenox Elementary School	35 Lenox Avenue, Pompton Lakes, NJ 07442	Electricity	
6503458401	Lenox Elementary School	35 Lenox Avenue, Pompton Lakes, NJ 07442	Natural Gas	
345702	Lenox Elementary School	35 Lenox Avenue, Pompton Lakes, NJ 07442	Water	

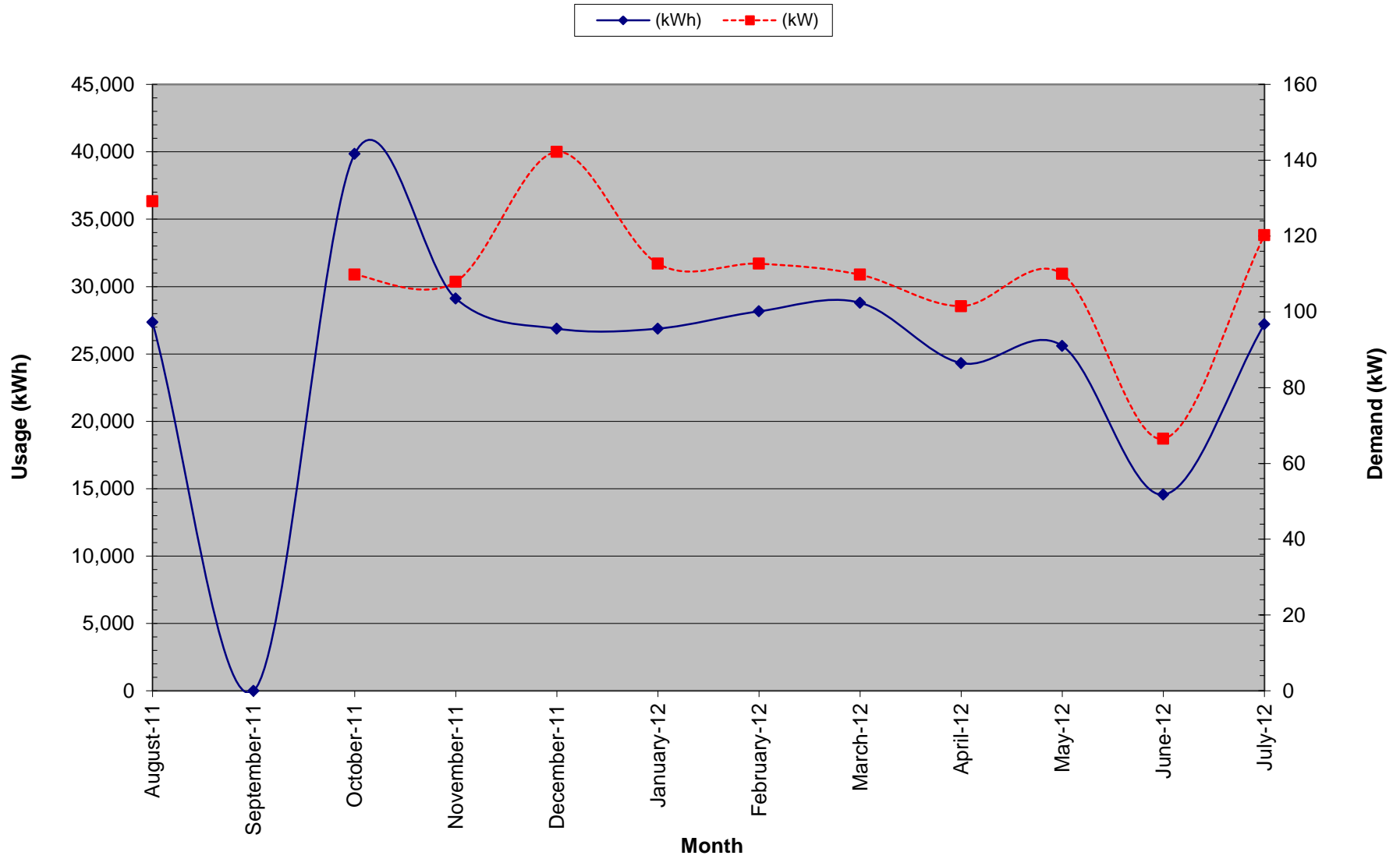
Pompton Lakes Board of Education
 237 Van Avenue, Pompton Lakes, NJ 07442

For Service at: Lenox Elementary School
 Account No.: 100004429922 Delivery - JCP&L
 Meter No.: G28742599 Supplier - JCP&L
 Electric Service

Month	Consumption		Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
	(kWh)	(kW)	Delivery (\$)	Supplier (\$)	Total (\$)	Consumption (\$)	Demand (\$)	Blended Rate (\$/kWh)	Consumption (\$/kWh)	Demand (\$/kW)
August-11	20,000	108.10	1,276.17	2,247.32	3,523.49	2,773.28	750.21	0.18	0.14	6.94
September-11	27,360	129.20	1,525.51	3,116.83	4,642.34	3,806.42	835.92	0.17	0.14	6.47
October-11	Included in November Bill									
November-11	39,840	109.80	2,162.34	4,540.92	6,703.26	5,566.61	1,136.65	0.17	0.14	10.35
December-11	29,120	107.90	1,443.32	3,250.96	4,694.28	3,996.17	698.11	0.16	0.14	6.47
January-12	26,880	142.20	1,594.44	2,996.85	4,591.29	3,671.26	920.03	0.17	0.14	6.47
February-12	26,880	112.70	1,403.58	2,996.85	4,400.43	3,485.58	914.85	0.16	0.13	8.12
March-12	28,160	112.70	1,431.32	3,149.49	4,580.81	3,851.64	729.17	0.16	0.14	6.47
April-12	28,800	109.80	1,279.91	3,259.36	4,539.27	3,828.86	710.41	0.16	0.13	6.47
May-12	24,320	101.50	1,144.56	2,753.41	3,897.97	3,241.26	656.71	0.16	0.13	6.47
June-12	25,600	110.00	1,294.99	3,040.03	4,335.02	3,571.62	763.40	0.17	0.14	6.94
July-12	14,560	66.50	783.96	1,540.52	2,324.48	1,862.97	461.51	0.16	0.13	6.94
August-12	27,200	120.20	1,374.98	2,877.89	4,252.87	3,418.68	834.19	0.16	0.13	6.94
Total (All)	318,720	142.20	\$16,715.08	\$35,770.43	\$52,485.51	\$43,074.35	\$9,411.16	\$0.16	\$0.14	\$7.78
Total (last 12-months)	298,720	142.20	\$15,438.91	\$33,523.11	\$48,962.02	\$40,301.07	\$8,660.95	\$0.16	\$0.13	\$7.16
Notes	1	2	3	4	5	6	7	8	9	10

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

Electric Usage - Lenox Elementary School

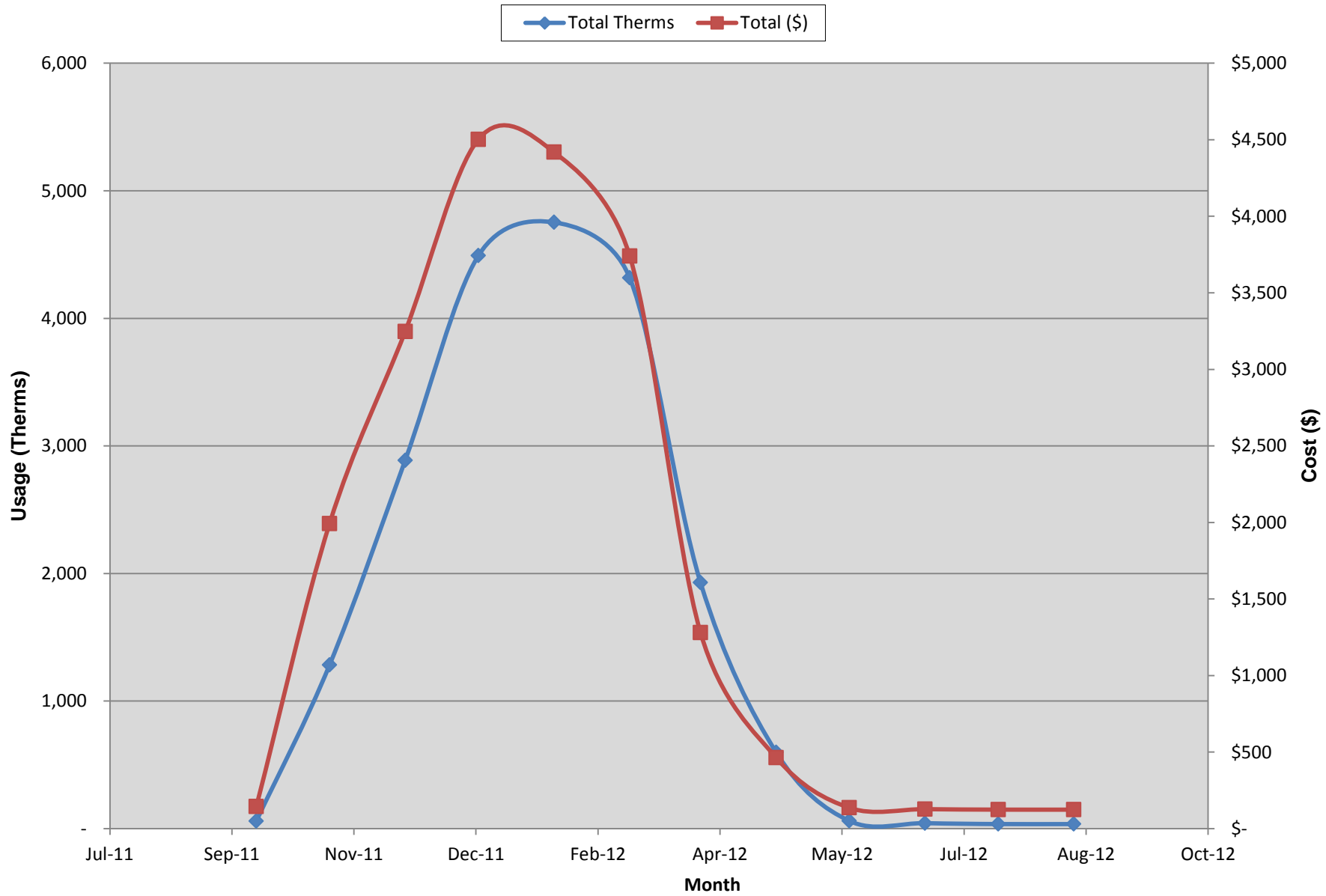


Pompton Lakes Board of Education
237 Van Avenue, Pompton Lakes, NJ 07442

For Service at: Lenox Elementary School
Account No.: 6503458401
Meter No.: 2732332 3229083
Natural Gas Service
Delivery - PSE&G
Supplier - PSE&G

Month	Total Therms	Delivery (\$)	Supply (\$)	Total (\$)	Blended Rate \$/Therm
Sep-11	59	\$ 108	37	\$ 145	\$ 2.45
Oct-11	1283	\$ 1,208	784	\$ 1,992	\$ 1.55
Nov-11	2887	1512	1,735	3247	\$ 1.28
Dec-11	4492	\$ 1,816	2,687	\$ 4,503	\$ 1.00
Jan-12	4752	\$ 1,697	2,722	\$ 4,419	\$ 0.93
Feb-12	4317	\$ 1,509	2,232	\$ 3,741	\$ 0.87
Mar-12	1929	\$ 331	950	\$ 1,281	\$ 0.66
Apr-12	598	\$ 184	280	\$ 464	\$ 0.78
May-12	61	\$ 108	28	\$ 136	\$ 2.25
Jun-12	43	\$ 106	22	\$ 127	\$ 2.97
Jul-12	36	\$ 105	19	\$ 124	\$ 3.47
Aug-12	36	\$ 105	19	\$ 124	\$ 3.48
Total (12-months)	20,493	\$ 8,789	\$ 11,515	\$20,303	\$ 0.99

Natural Gas Usage - Lenox Elementary School



Pompton Lakes Board of Education
237 Van Avenue, Pompton Lakes, NJ 07442

For Service at: Lenox Elementary School

Account No.: 345702

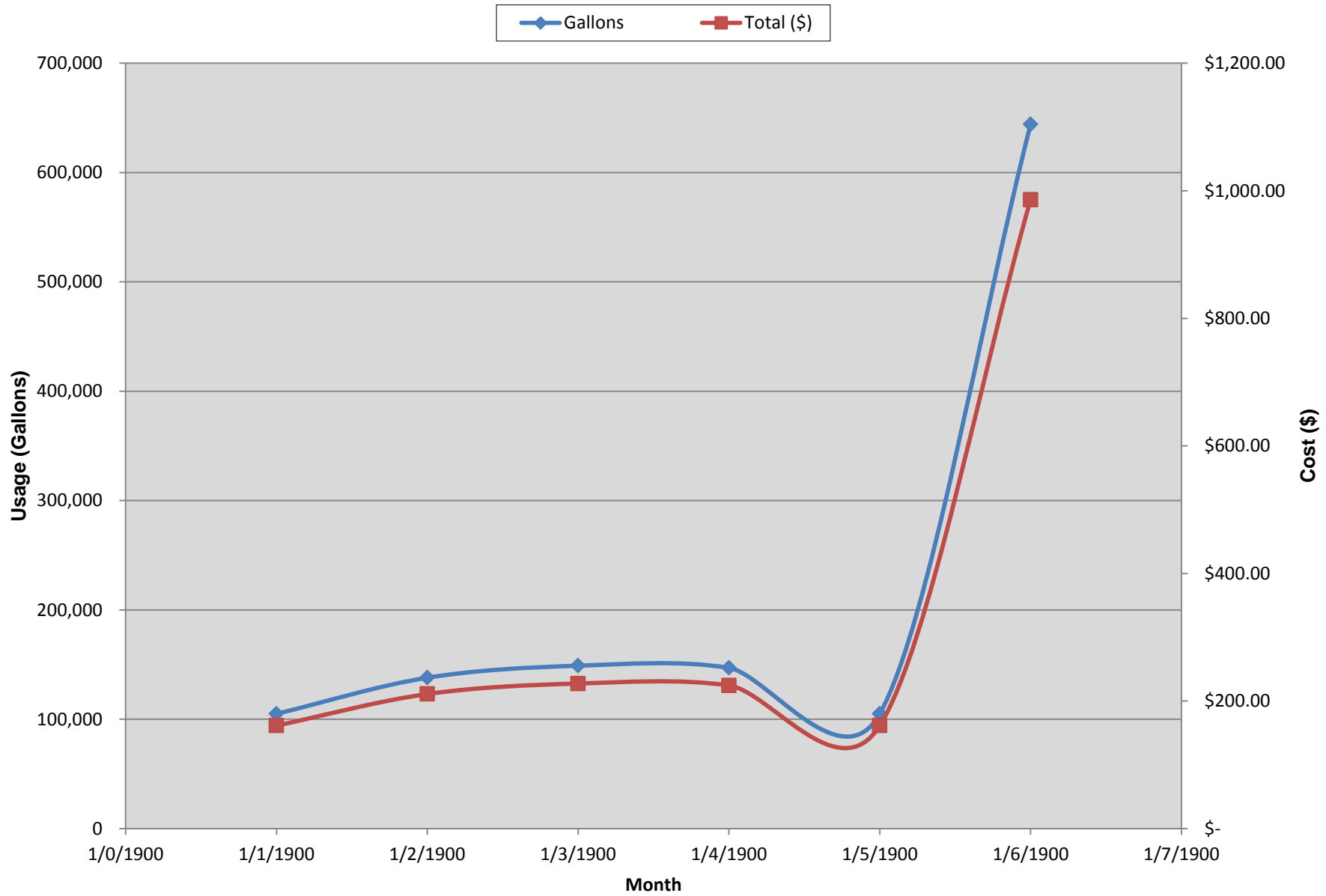
Water

Delivery -

Supplier -

Month	Gallons	Total (\$)	\$/kGal
Oct-11	105,000	\$ 161.50	\$ 1.54
Jan-12	138,000	\$ 211.00	\$ 1.53
Apr-12	149,000	\$ 227.50	\$ 1.53
Jul-12	147,000	\$ 224.50	\$ 1.53
Oct-12	105,000	\$ 161.50	\$ 1.54
Total	644,000	\$ 986.00	\$ 1.53

Water Usage - Lenox Elementary School



JCP&L SERVICE TERRITORY
Last Updated: 10/24/12

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

Supplier	Telephone & Web Site	*Customer Class
AEP Energy, Inc. 309 Fellowship Road, Fl.2 Mount Laurel, NJ 08054	(866) 258-3782 www.aepenergy.com	C/I ACTIVE
Alpha Gas and Electric, LLC 641 5 th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	R/C ACTIVE
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877) 30-AMBIT (877) 302-6248 www.ambitenergy.com	R/C ACTIVE
AP Gas & Electric, LLC 10 North Park Place, Suite 420 Morristown, NJ 07960	(855) 544-4895 www.apge.com	R/C/I ACTIVE
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(201) 384-5552 www.astralenergyllc.com	R/C/I ACTIVE
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	(888) 651-4121 www.greateasternenergy.com	C/I ACTIVE
Champion Energy Services, LLC 72 Avenue L Newark, NJ 07105	(877) 653-5090 www.championenergyservices.com	R/C/I ACTIVE
Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	888-565-4490 www.4choiceenergy.com	R/C ACTIVE
Clearview Electric, Inc. 505 Park Drive Woodbury, NJ 08096	(888) CLR-VIEW (800) 746-4702 www.clearviewenergy.com	R/C/I ACTIVE
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07446	1-866-587-8674 www.commerceenergy.com	R 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
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(866) 237-7693 www.constellation.com	R/C/I ACTIVE
Constellation Energy 900A Lake Street, Suite 2 Ramsey, NJ 07446	(877) 997-9995 www.constellation.com	R ACTIVE
Direct Energy Business, LLC 120 Wood Avenue Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergybusiness.com	C/I ACTIVE
Direct Energy Services, LLC 120 Wood Avenue Suite 611 Iselin, NJ 08830	(866) 547-2722 www.directenergy.com	C/I ACTIVE
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, NJ 08002	(800) 282-3331 www.discountenergygroup.com	R/C ACTIVE
Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route 70 West, Suite 125 Lakewood, NJ 08701	(866) 275-4240 www.dom.com/products	R/C ACTIVE
DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102	(877) 332-2450 www.dtesupply.com	C/I ACTIVE
Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054	(877) 866-9193 www.energypluscompany.com	R/C ACTIVE
Energy.me Midwest LLC 90 Washington Blvd Bedminster, NJ 07921	(855) 243-7270 www.energy.me	R/C/I ACTIVE

Ethical Electric Benefit Co. d/b/a Ethical Electric 100 Overlook Center, 2 nd Fl. Princeton, NJ 08540	(888) 444-9452 www.ethicalelectric.com	R/C ACTIVE
FirstEnergy Solutions Corp. 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 www.fes.com	C/I ACTIVE
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com	R/C/I ACTIVE
GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, NJ 08819	(866) 999-8374 www.gdfsuezenergyresources.com	C/I ACTIVE
Glacial Energy of New Jersey, Inc. 75 Route 15 Building E Lafayette, NJ 07848	(888) 452-2425 www.glacialenergy.com	C/I ACTIVE
Green Mountain Energy Company 211 Carnegie Center Drive Princeton, NJ 08540	(866) 767-5818 www.greenmountain.com/commercial-home	C/I ACTIVE
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	C/I ACTIVE
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	R/C ACTIVE
HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Ridgefield, NJ 07657	(877) 390-7155 www.hopenergy.com	R/C/I ACTIVE
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	(973) 438-4380 www.idtenergy.com	R/C ACTIVE

Independence Energy Group, LLC 211 Carnegie Center Princeton, NJ 08540	(877) 235-6708 www.chooseindependence.com	R/C ACTIVE
Integrus Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrusenergy.com	C/I ACTIVE
Liberty Power Delaware, LLC 3000 Atrium Way Suite 273 Mt. Laurel, NJ 08054	(866) 769-3799 www.libertypowercorp.com	R/C/I ACTIVE
Liberty Power Holdings, LLC 3000 Atrium Way Suite 273 Mt. Laurel, NJ 08054	(866) 769-3799 www.libertypowercorp.com	R/C/I ACTIVE
Linde Energy Services 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.linde.com	C/I ACTIVE
Marathon Power LLC 302 Main Street Paterson, NJ 07505	(888) 779-7255 www.mecny.com	R/C/I ACTIVE
NATGASCO, Inc. 532 Freeman St. Orange, NJ 07050	(973) 678-1800 x. 251 www.supremeenergyinc.com	R/C ACTIVE
NextEra Energy Services New Jersey, LLC 651 Jernee Mill Road Sayreville, NJ 08872	(877) 528-2890 Commercial (800) 882-1276 Residential www.nexteraenergyservices.com	R/C/I ACTIVE
NJ Gas & Electric 1 Bridge Plaza fl.2 Fort Lee, NJ 07024	(866) 568-0290 www.NJGandE.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
North American Power and Gas, LLC 222 Ridgedale Ave. Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	R/C/I ACTIVE

Palmco Power NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	R/C/I ACTIVE
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) ENERGY-9 (363-7499) www.pepco-services.com	R/C ACTIVE
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	R/C/I ACTIVE
PPL EnergyPlus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com	C/I ACTIVE
Public Power & Utility of New Jersey, LLC 39 Old Ridgebury Rd. Suite 14 Danbury, CT 06810	(888) 354-4415 www.ppandu.com	R/C/I ACTIVE
Reliant Energy 211 Carnegie Center Princeton, NJ 08540	(877) 297-3795 (877) 297-3780 www.reliant.com/pjm	R/C/I ACTIVE
ResCom Energy LLC 18C Wave Crest Ave. Winfield Park, NJ 07036	(888) 238-4041 http://rescomenergy.com	R/C/I ACTIVE
Respond Power LLC 10 Regency CT Lakewood, NJ 08701	(877) 973-7763 www.respondpower.com	R/C/I ACTIVE
South Jersey Energy Company 1 South Jersey Plaza Route 54 Folsom, NJ 08037	(800) 800-266-6020 www.southjerseyenergy.com	C/I ACTIVE
Sperian Energy Corp. 1200 Route 22 East, Suite 2000 Bridgewater, NJ 08807	(888) 682-8082	R/C/I ACTIVE
Starion Energy PA Inc. 101 Warburton Avenue Hawthorne, NJ 07506	(800) 600-3040 www.starionenergy.com	R/C/I ACTIVE

Stream Energy 309 Fellowship Road Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	R ACTIVE
UGI Energy Services, Inc. d/b/a GASMAR 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com	C/I ACTIVE
Verde Energy USA, Inc. 50 East Palisades Avenue Englewood, NJ 07631	(800) 388-3862 www.lowcostpower.com	R/C/I ACTIVE
Viridian Energy 2001 Route 46 Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	R/C/I ACTIVE
Xoom Energy New Jersey, LLC 744 Broad Street Newark, 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

PSE&G GAS SERVICE TERRITORY
Last Updated: 10/24/12

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

Supplier	Telephone & Web Site	*Customer Class
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877)-30-AMBIT (877) 302-6248 www.ambitenergy.com	R/C 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.greasternenergy.com	C/I ACTIVE
Clearview Electric Inc. d/b/a Clearview Gas 1744 Lexington Ave. Pennsauken, NJ 08110	800-746-4720 www.clearviewenergy.com	R/C ACTIVE
Colonial Energy, Inc. 83 Harding Road Wyckoff, NJ 07481	845-429-3229 www.colonialgroupinc.com	C/I ACTIVE
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07746	(888) 817-8572 www.commerceenergy.com	R ACTIVE
Compass Energy Services, Inc. 1085 Morris Avenue, Suite 150 Union, NJ 07083	866-867-8328 908-638-6605 www.compassenergy.net	C/I ACTIVE
ConocoPhillips Company 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-646-4427 www.conocophillips.com	C/I ACTIVE
Consolidated Edison 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 900A Lake Street, Suite 2 Ramsey, NJ 07466	(800) 900-1982 www.constellation.com	C/I ACTIVE
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 www.directenergy.com	C/I ACTIVE
Direct Energy Services, LLP 120 Wood Avenue, Suite 611 Iselin, NJ 08830	866-348-4193 www.directenergy.com	R ACTIVE
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	800-805-8586 www.gesc.com	R/C/I ACTIVE
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergyservices.com	C/I ACTIVE
Global Energy Marketing, LLC 129 Wentz Avenue Springfield, NJ 07081	800-542-0778 www.globalp.com	C/I ACTIVE
Great Eastern Energy 116 Village Blvd., Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	C/I ACTIVE
Greenlight Energy 330 Hudson Street, Suite 4 Hoboken, NJ 07030	718-204-7467 www.greenlightenergy.us	C ACTIVE
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	C/I ACTIVE
Hess Small Business Services, LLC One Hess Plaza Woodbridge, NJ 07095	888-494-4377 www.hessenergy.com	C/I ACTIVE
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	R/C ACTIVE

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
IntegrYS Energy Services – Natural Gas, LLC 99 Wood Avenue South Suite #802 Iselin, NJ 08830	800-536-0151 www.integrYSenergy.com	C/I ACTIVE
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	800-927-9794 www.intelligentenergy.org	R/C/I ACTIVE
Keil & Sons, Inc. d/b/a Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	1-877-797-8786 www.systrumenergy.com	R/C/I ACTIVE
Major Energy Services, LLC 10 Regency CT Lakewood, NJ 08701	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	800-828-9427 www.metromediaenergy.com	C ACTIVE
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	888-53-Metro www.metroenergy.com	R/C ACTIVE
MxEnergy, Inc. 900 Lake Street Ramsey, NJ 07446	800-758-4374 www.mxenergy.com	R/C/I ACTIVE
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	800-840-4GAS www.natgasco.com	C ACTIVE
New Energy Services LLC 101 Neptune Avenue Deal, New Jersey 07723	800-660-3643 www.newenergyservicesllc.com	R/C/I ACTIVE

New Jersey Gas & Electric 1 Bridge Plaza, Fl. 2 Fort Lee, NJ 07024	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. 3000 East Brunswick, NJ 08816	(888) 313-9086 www.napower.com	R/C/I ACTIVE
Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	R/C/I ACTIVE
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	800-363-7499 www.pepco-services.com	C/I ACTIVE
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	855-32-POWER (76937) www.plymouthenergy.com	R/C/I ACTIVE
PPL EnergyPlus, LLC 811 Church Road - Office 105 Cherry Hill, NJ 08002	800-281-2000 www.pplenergyplus.com	C/I ACTIVE
Respond Power LLC 10 Regency CT Lakewood, NJ 08701	(877) 973-7763 www.respondpower.com	R/C/I ACTIVE
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	800-266-6020 www.southjerseyenergy.com	C/I ACTIVE
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	800-695-0666 www.sjnaturalgas.com	R/C ACTIVE
Spark Energy Gas, L.P. 2105 CityWest Blvd, Ste 100 Houston, Texas 77042	800-411-7514 www.sparkenergy.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	(973) 494-8097 www.streamenergy.net	R/C ACTIVE
Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	877-797-8786 www.systrumenergy.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 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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APPENDIX B

Equipment Inventory

APPENDIX C

ECM Calculations

Summary of Energy Conservation Measures							
Energy Conservation Measure		Approx. Costs	Approx. Savings (\$/year)	Payback (Years) w/o Incentive	Potential Incentive (\$)*	Payback (Years) w/ Incentive	Recommended For Implementation
		(\$)					
ECM-1	Door & Window Seals	6,054	1,800	3	0	3	X
ECM-2	Boiler Replacement	530,000	7,400	>20	6,000	>20	
ECM-3	Install DDC & BMS	302,000	4,400	>20	0	>20	
ECM-4	Lighting Replacement / Upgrades	50,000	8,400	6	5,400	5	X
ECM-5	Install Lighting Controls (Occupancy Sensors)	14,000	6,300	2	3,300	2	X
ECM-6	Lighting Replacements with Lighting Controls (Occupancy Sensors)	64,000	12,000	5	8,700	5	X
ECM-7	Install Network Controller	2,000	1,300	2	0	2	X
ECM-8	Install Low Flow Plumbing Fixtures	114,000	500	>20	0	>20	
ECM-9	Replace Electric Kitchen Equipment with Natural Gas Equipment	39,000	24,300	2	0	2	X

Pompton Lakes-Lenox ES - NJBPU
CHA Project #24698
Lenox Elementary School

ECM Summary Sheet

ECM-1 Door & Window Seals

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
6,000	0	0	1,800	1,800	0	1,800	0.4	0	3.3	3.3

Expected Life: 5 years
 Lifetime Savings: 0 kWh 9,000 therms \$ 9,000

ECM-2 Boiler Replacement

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
530,000	0	0	7,500	7,400	0	7,400	(0.6)	6,000	>20	>20

Expected Life: 25 years
 Lifetime Savings: 0 kWh ##### therms #####

ECM-3 Install DDC & BMS 0.0

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
302,000	2,500	0	3,700	4,400	0	4,400	(0.8)	0	>20	>20

Expected Life: 16 years
 Lifetime Savings: 40,000 kWh 59,200 therms \$ 70,400

ECM-4 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
50,000	50,100	20.5	0	8,400	0	8,400	1.5	5,400	6.0	5.3

Expected Life: 15 years
 Lifetime Savings: 751,500 kWh 0 therms #####

ECM-5 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
14,000	38,300	0	0	6,300	0	6,300	5.7	3,300	2.2	1.7

Expected Life: 15 years
 Lifetime Savings: 574,500 kWh 0 therms \$ 94,500

ECM-6 Lighting Replacements with Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
64,000	76,900	21	0	12,000	0	12,000	1.8	8,700	5.3	4.6

Expected Life: 15 years
 Lifetime Savings: 1,153,500 kWh 0 therms #####

ECM-7 Install Network Controller

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
2,000	7,900	0	0	1,300	0	1,300	12.7	0	1.5	1.5

Expected Life: 16 years
 Lifetime Savings: 126,400 kWh 0 therms \$ 20,800

ECM-8 Install Low Flow Plumbing Fixtures

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Water kGal	Total \$						
\$					\$	\$		\$		
114,000	0	0	400	500	0	500	(1.0)	0	>20	>20

Expected Life: 15 years
 Lifetime Savings: 0 kWh 6,000 kGal \$ 7,500

ECM-9 Replace Electric Kitchen Equipment with Natural Gas Equipment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive) Years	Payback (with incentive) Years
	Electric kWh	Electric kW	Nat Gas Therms	Total \$						
\$					\$	\$		\$		
39,000	142,500	100	-4,900	24,300	0	24,300	6.5	0	1.6	1.6

Expected Life: 12 years
 Lifetime Savings: 1,710,000 kWh -58,800 therms #####

Pompton Lakes-Lenox ES - NJBPU
CHA Project #24698

Multiplier Factors 2012 RS Means	
Material:	1.01
Labor:	1.25
Equipment:	1.00

Utility Costs	Yearly Usage	MTCDE
\$ 0.164 \$/kWh blended		0.00042
\$ 0.135 \$/kWh cooling	298,720	0.00042
\$ 6.560 \$/kW	142.2	0
\$ 0.991 \$/Therm	20,493	0.00533
\$ 1.532 \$/kGallon Water		

Lenox Elementary School

	Item	Savings					Cost	Simple Payback	MTCDE	Life Expectancy	NJ Smart Start Incentives
		kW	kWh	therms	kGal	\$					
ECM-1	Door & Window Seals	0.0	0	1,768	0	\$ 1,800	\$ 6,054	3.4	9.4	5	\$ -
ECM-2	Boiler Replacement	0.0	0	7,499	0	\$ 7,400	\$ 530,313	71.7	40.0	25	\$ 6,000
ECM-3	Install DDC & BMS	5.0	2500.0	3,729	0	\$ 4,400	\$ 302,040	68.6	20.9	16	\$ -
ECM-4	Lighting Replacement / Upgrades	20.5	50,139	0	0	\$ 8,400	\$ 50,284	6.0	21.1	15	\$ 5,360
ECM-5	Install Lighting Controls (Occupancy Sensors)	0.0	38,255	0	0	\$ 6,300	\$ 14,100	2.2	16.1	15	\$ 3,290
ECM-6	Lighting Replacements with Lighting Controls (Occupancy Sensors)	20.5	76,860	0	0	\$ 12,000	\$ 64,084	5.3	32.3	15	\$ 8,650
ECM-7	Install Network Controller	0.0	7920.0	0	0	\$ 1,300	\$ 1,521	1.2	3.3	16	\$ -
ECM-8	Install Low Flow Plumbing Fixtures	0.0	0	0	322	\$ 500	\$ 114,267	228.5	0.0	15	\$ -
ECM-9	Replace Electric Kitchen Equipment with Natural	125.0	142,500	(4,862)	0	\$ 24,300	\$ 38,999	1.6	33.9	12	\$ -

ECM 1-Door & Window Seals

Existing: Lack of door seals result in excessive heat loss and infiltration
Proposed: Install door seals and/or weather-stripping to reduce air infiltration

Heating System Efficiency	55%
Linear Feet of Door & Window Edge	360
Existing Door Infiltration Factor*	1.5 cfm/LF
Proposed Door Infiltration Factor*	0.45 cfm/LF

Heating System Efficiency	55%
Heating On Temp.	60 *F
Ex Occupied Htg Temp.	72 *F
Ex Unoccupied Htg Temp.	72 *F
Electricity	\$ 0.164 \$/kWh
Natural Gas	\$ 0.99 \$/therm

*Infiltration Factor per Carrier Handbook of Air Conditioning System Design based on average do

Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	EXISTING LOADS		PROPOSED LOADS		HEATING ENERGY	
					Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Existing Heating Energy therms	Proposed Heating Energy therms
A		B	C	D	E	F	G	H	K	L
102.5	50.1	0	0	0	0	0	0	0	0	0
97.5	42.5	3	1	2	0	0	0	0	0	0
92.5	39.5	34	12	22	0	0	0	0	0	0
87.5	36.6	131	47	84	0	0	0	0	0	0
82.5	34.0	500	179	321	0	0	0	0	0	0
77.5	31.6	620	221	399	0	0	0	0	0	0
72.5	29.2	664	237	427	0	0	0	0	0	0
67.5	27.0	854	305	549	0	0	0	0	0	0
62.5	24.5	927	331	596	0	0	0	0	0	0
57.5	21.4	600	214	386	8,456	8,456	2,537	2,537	92	28
52.5	18.7	610	218	392	11,372	11,372	3,412	3,412	126	38
47.5	16.2	611	218	393	14,288	14,288	4,287	4,287	159	48
42.5	14.4	656	234	422	17,204	17,204	5,161	5,161	205	62
37.5	12.6	1,023	365	658	20,120	20,120	6,036	6,036	374	112
32.5	10.7	734	262	472	23,036	23,036	6,911	6,911	307	92
27.5	8.6	334	119	215	25,952	25,952	7,786	7,786	158	47
22.5	6.8	252	90	162	28,868	28,868	8,661	8,661	132	40
17.5	5.5	125	45	80	31,784	31,784	9,535	9,535	72	22
12.5	4.1	47	17	30	34,700	34,700	10,410	10,410	30	9
7.5	2.6	22	8	14	37,616	37,616	11,285	11,285	15	5
2.5	1.0	13	5	8	40,532	40,532	12,160	12,160	10	3
-2.5	0.0	0	0	0	43,448	43,448	13,035	13,035	0	0
-7.5	-1.5	0	0	0	46,364	46,364	13,909	13,909	0	0
TOTALS		8,760	3,129	5,631					1,680	504

Existing Door Infiltration	540 cfm
Existing Unoccupied Door Infiltration	540 cfm
Proposed Door Infiltration	162 cfm
Proposed Unoccupied Door Infiltration	162 cfm

Savings	1,176 therms	\$ 1,166
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Door	Width (ft)	Height (ft)	Linear Feet (LF)	gap (in)	gap location	LF of gap	% door w/ gap	Average gap for door (in)
1a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
1b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
2a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
2b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
3a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
3b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
4a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
4b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
5a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
5b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
6a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
6b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
7a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
7b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
8a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
8b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
9a	3	7	20	0.0625	Seams	0.125	1%	0.000390625
9b	3	7	20	0.0625	Seams	0.125	1%	0.000390625
Total	54	126	360	0.063		2	1%	0.000

Note: Doors labeled 'a', 'b', etc. are a part of the same door assembly.

ECM 1-Door & Window Seals

Existing: Lack of door seals result in excessive heat loss and infiltration
Proposed: Install door seals and/or weather-stripping to reduce air infiltration

Heating System Efficiency **55%**
Linear Feet of Window Edge **1,900.0**
Existing Window Infiltration Factor **0.2** cfm/LF
Proposed Window Infiltration Factor* **0.1** cfm/LF
*Infiltration Factor per Carrier Handbook of Air Conditioning System Design based on average door seal gap calculated below.

Heating System Efficiency **55%**
Heating On Temp. **60** *F
Ex Occupied Htg Temp. **72** *F
Ex Unoccupied Htg Temp. **72** *F
Electricity **\$ 0.164** \$/kWh
Natural Gas **\$ 0.99** \$/therm

Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	EXISTING LOADS		PROPOSED LOADS		HEATING ENERGY			
					Occupied		Unoccupied		Occupied		Unoccupied	
					Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Existing Heating Energy therms	Proposed Heating Energy therms		
A		B	C	D	E	F	G	H	K	L		
102.5	50.1	0	0	0	0	0	0	0	0	0	0	
97.5	42.5	3	1	2	0	0	0	0	0	0	0	
92.5	39.5	34	12	22	0	0	0	0	0	0	0	
87.5	36.6	131	47	84	0	0	0	0	0	0	0	
82.5	34.0	500	179	321	0	0	0	0	0	0	0	
77.5	31.6	620	221	399	0	0	0	0	0	0	0	
72.5	29.2	664	237	427	0	0	0	0	0	0	0	
67.5	27.0	854	305	549	0	0	0	0	0	0	0	
62.5	24.5	927	331	596	0	0	0	0	0	0	0	
57.5	21.4	600	214	386	5,951	5,951	2,975	2,975	65	32		
52.5	18.7	610	218	392	8,003	8,003	4,001	4,001	89	44		
47.5	16.2	611	218	393	10,055	10,055	5,027	5,027	112	56		
42.5	14.4	656	234	422	12,107	12,107	6,053	6,053	144	72		
37.5	12.6	1,023	365	658	14,159	14,159	7,079	7,079	263	132		
32.5	10.7	734	262	472	16,211	16,211	8,105	8,105	216	108		
27.5	8.6	334	119	215	18,263	18,263	9,131	9,131	111	55		
22.5	6.8	252	90	162	20,315	20,315	10,157	10,157	93	47		
17.5	5.5	125	45	80	22,367	22,367	11,183	11,183	51	25		
12.5	4.1	47	17	30	24,419	24,419	12,209	12,209	21	10		
7.5	2.6	22	8	14	26,471	26,471	13,235	13,235	11	5		
2.5	1.0	13	5	8	28,523	28,523	14,261	14,261	7	3		
-2.5	0.0	0	0	0	30,575	30,575	15,287	15,287	0	0		
-7.5	-1.5	0	0	0	32,627	32,627	16,313	16,313	0	0		
TOTALS		8,760	3,129	5,631					1,182	591		

Existing Window Infiltration **380** cfm
Existing Unoccupied Window Infiltration **380** cfm
Proposed Window Infiltration **190** cfm
Proposed Unoccupied Window Infiltration **190** cfm

Savings	591 therms	\$ 586
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Window ID	Location	Quantity	Width (ft)	Height (ft)	Linear Feet (LF)
1	Exterior Wall	130	3	4	1820.0
2	Exterior Wall	4	4	6	80.0
Total		134	7	10	1,900.0

Pompton Lakes-Lenox ES - NJBPU
 CHA Project #24698

Multipliers	
Material:	1.01
Labor:	1.25
Equipment:	1.00

ECM 1-Door & Window Seals Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Door Seals	9	LS	\$ 30	\$ -	\$ -	\$ 274	\$ -	\$ -	\$ 274	
Window Seals	1900	LF	\$ 3	\$ -	\$ -	\$ 5,780	\$ -	\$ -	\$ 5,780	

\$ 6,054	Subtotal
20%	
-	
-	
\$ -	
\$ 6,054	Total

Pompton Lakes-Lenox ES - NJBPU
 CHA Project #24698

Utility Costs	
\$ 0.164	\$/kWh blended
\$ 0.135	\$/kWh consumption
\$ 6.560	\$/kW
\$ 0.991	\$/Therm

ECM 2- Boiler Replacement

Existing Fuel Nat. Gas
Proposed Fuel Nat. Gas

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	\$ 0.99	/ Therm	
Proposed Fuel Cost	\$ 0.99	/ Therm	
Baseline Fuel Use	18,646	Therms	Based on historical utility data
Existing Boiler Plant Efficiency	55%		Estimated
Baseline Boiler Load	1,025,530	Mbtu/yr	Baseline Fuel Use x Existing Efficiency x 100 Mbtu/Therms
Baseline Fuel Cost	\$ 18,478		
Proposed Boiler Plant Efficiency	92%		New Boiler Efficiency
Proposed Fuel Use	11,147	Therms	Baseline Boiler Load / Proposed Efficiency / 100 Mbtu/Therms
Proposed Fuel Cost	\$ 11,047		

*Note to engineer: Link savings back to summary sheet in appropriate column.

BOILER REPLACEMENT SAVINGS SUMMARY					
	Electric Demand	Electric Usage	Nat Gas Usage	Maint.	Total Cost
	(kW)	(kWh)	(Therms)	(\$)	(\$)
Savings	0	0	7,499	\$0	\$7,431

Pompton Lakes-Lenox ES - NJBPU
 CHA Project #24698

Multipliers	
Material:	1.01
Labor:	1.25
Equipment:	1.00

ECM 2- Boiler Replacement Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Demo existing boilers	2	EA	\$ -	\$ 10,000	\$ -					
3,000 MBH NG Condensing Boiler	2	EA	\$ 45,000	\$ 40,000	\$ -	\$ 91,260	\$ 99,600	\$ -	\$ 190,860	
Venting & Combustion Air	2	LS	\$ 5,000	\$ 2,500	\$ -	\$ 10,140	\$ 6,225	\$ -	\$ 16,365	
Pumps	2	EA	\$ 2,500	\$ 1,500	\$ -	\$ 5,070	\$ 3,735	\$ -	\$ 8,805	
Miscellaneous Electrical	2	LS	\$ 500	\$ 250	\$ -	\$ 1,014	\$ 623	\$ -	\$ 1,637	
Miscellaneous HW Piping	2	LS	\$ 5,000	\$ 15,000	\$ -	\$ 10,140	\$ 37,350	\$ -	\$ 47,490	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

\$ 265,157	20%
-	
-	
\$ 265,157	
\$ 530,313 Total	

Pompton Lakes-Lenox ES - NJBPU
CHA Project #24698

Utility Costs	
\$	0.164 \$/kWh blended
\$	0.135 \$/kWh consumption
\$	6.560 \$/kW
\$	0.991 \$/Therm

ECM 3- Install DDC & BMS

EXISTING CONDITIONS	
Electricity Consumed by Air Compressor	2,500 kWh
Natural Gas Consumed by HVAC System	18,646 Therms ¹

5kW * 500 hours
From Utility Analysis

SAVINGS	
Electric Savings	2,500 kWh ²
Electric Demand Savings	5 kW ²
Natural Gas Savings	3,729 Therms ³
Total Cost Savings	\$ 4,427
Estimated Total Project Cost	\$ 302,040 ^{4,5}
Simple Payback	68.2 years

Assumptions

- | | | | |
|---|---|---|-----|
| 1 | Natural Gas consumption based on utility data, boiler capacity & operating hours | - | 20% |
| 2 | Electric savings from removing the air compressor | - | |
| 3 | 20% Approximate natural gas savings from night setback & temperature scheduling | - | 0 |
| 4 | Project cost is an estimate, includes cost of replacing non- programmable thermostats with programmable thermostats | | |
| 5 | control work cost | | |

Pompton Lakes-Lenox ES - NJBPU
 CHA Project #24698

Multipliers	
Material:	1.01
Labor:	1.25
Equipment:	1.00

ECM 3- Install DDC & BMS Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	
Control System	1	LS	\$ 150,000	\$ 50,000	\$ -	\$ 152,100	\$ 62,250	\$ -	\$ 214,350	
Removing Pneumatics	1	LS		\$ 10,000	\$ -	\$ -	\$ 12,450	\$ -	\$ 12,450	
Programming	1	LS		\$ 20,000	\$ -	\$ -	\$ 24,900	\$ -	\$ 24,900	
							\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

\$ 251,700	Subtotal
\$ 50,340.00	20% Contingency
-	
-	
\$ 302,040	Total

High Bridge Elementary School
CHA Project #24533
40 Fairview Ave
High Bridge, NJ

ECM-7: Install Network Controller

Background Data	
Average Consumption and Savings Figures	
	kWh
Average Total Consumption per PC per Year	500-700
Average Energy and Cost Waste per PC per Year	350-450
Average savings transparently available via Surveyor	120

Number of PCs	66
Return on Investment Analysis	
Annual Energy Savings	kWh 7,920

Notes:

1. Savings are for the installation of a centralized computer management system installed on the client server that will centralize the power management functions that are native to the Windows environment.
2. Energy savings per computer are based on historical information from previous installations encompassing tens of thousands of computers.
3. There are approximately 60 computers in all

High Bridge Elementary School
 CHA Project #24533
 40 Fairview Ave
 High Bridge, NJ

City cost multipliers from 2012 RS Means

Multipliers	
Material:	1.00
Labor:	1.24
Equipment:	0.98

Utility Costs	
\$ 0.138	\$/kWh blended
\$ 0.113	\$/kWh consumption
\$ 6.044	\$/kW
\$ 1.036	\$/Therm

ECM-5 Network Controller Cost

ECM Description Summary

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	
Network Controller	66	EA	\$ 8	\$ -		\$ 526	\$ -	\$ -	\$ 526	
IT Deployment	1	EA	\$ -	\$ 600		\$ -	\$ 742	\$ -	\$ 742	
						\$ -	\$ -	\$ -	\$ -	

Note: Costs are for energy savings only. Do not use for procurement

\$ 1,267	Subtotal
\$ 253	20% Contingency
-	
-	
\$ 1,521	Total

20%

-

-

0

Pompton Lakes-Lenox ES - NJBPU
 CHA Project #24698

ECM-8: Replace toilets and flush valves with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$1.53	\$/ kGal
Toilets in Building	14	
Average Flushes / Toilet (per Day)	4	
Average Gallons / Flush	5.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	14	
Proposed Gallons / Flush	1.3	Gal

SAVINGS		
Current Urinal Water Use	308	kGal / year
Proposed Urinal Water Use	72	kGal / year
Water Savings	236	kGal / year
Cost Savings	\$362	/ year

- 20%
 -
 0

Pompton Lakes-Lenox ES - NJBPU
 CHA Project #24698

ECM-8: Replace urinals and flush valves with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$1.53	\$ / kGal
Urinals in Building	10	
Average Flushes / Urinal (per Day)	4	
Average Gallons / Flush	3.0	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	10	
Proposed Gallons / Flush	0.1	Gal

SAVINGS		
Current Urinal Water Use	44	kGal / year
Proposed Urinal Water Use	2	kGal / year
Water Savings	42	kGal / year
Cost Savings	\$64	/ year

 -
 -
 0

Pompton Lakes-Lenox ES - NJBPU
 CHA Project #24698

ECM-8: Replace faucets with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$1.53	\$/ kGal
Faucets in Building	24	
Average Uses / Faucet (per day)	4	Gal
Average Time of Use	0.5	min
Average Flowrate	3.0	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	24	
Proposed Flowrate	0.5	gpm

SAVINGS		
Current Faucet Water Use	53	kGal / year
Proposed Faucet Water Use	9	kGal / year
Water Savings	44	kGal / year
Cost Savings	\$67	/ year

- 20%
 -
 0

Pompton Lakes-Lenox ES - NJBPU
 CHA Project #24698

Multipliers	
Material:	1.01
Labor:	1.25
Equipment:	1.00

ECM 8: Low Flow Plumbing Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Flush Valves & Toilets	14	EA	\$ 1,400.00	\$ 1,000.00	\$ -	\$ 19,874.40	\$ 17,430.00	\$ -	\$ 37,304	
Urinals & Valves	10	EA	\$ 1,200.00	\$ 1,000.00	\$ -	\$ 12,168.00	\$ 12,450.00	\$ -	\$ 24,618	
Faucets	24	EA	\$ 1,000.00	\$ 300.00	\$ -	\$ 24,336.00	\$ 8,964.00	\$ -	\$ 33,300	

\$ 95,222	Subtotal
\$ 19,044.48	20% Contingency
-	
-	
\$ 114,267	Total

Pompton Lakes-Lenox ES - NJBPU
CHA Project #24698

Utility Costs	
\$ 0.164	\$/kWh blended
\$ 0.135	\$/kWh consumption
\$ 6.560	\$/kW
\$ 0.991	\$/Therm

ECM-9: Replace Electric Kitchen Equipment with Natural Gas Equipment

ECM Description Summary

A commercial cafeteria kitchen typically contains large equipment such as a double stack oven, a full size range with oven, a food warmer(s), table top kettle cooker(s), etc. This equipment consumes large amounts of energy, and with the cost of electricity versus natural gas, it is worthwhile to consider replacing electric equipment with natural gas equipment. The assumption of this calculation is that the operating hours and electrical power consumption of the existing electrical equipment are replaced with newer, more efficient equipment using natural gas. The savings are compared to the cost of new gas kitchen equipment; the connection cost (if any) to the natural gas utility and piping in the

Existing Fuel

Proposed Fuel

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	\$ 0.14	/ kWh	
Baseline Fuel Cost	\$ 6.56	/ kW	
Proposed Fuel Cost	\$ 0.99	/ Therm	
Kitchen Equipment			
- Commercial Double Stack Oven	25.0	kW	Based on equipment nameplat data
- Commercial Range	34.0	kW	Based on equipment nameplat data
- Commercial Tabletop Steamer	42.0	kW	Based on equipment nameplat data
- Dishwasher Booster Heater	24.0	kW	Based on equipment nameplat data
- Total Equipmetn kW	125.0	kW	
Kitchen Annual Operating Hours	1,140	hours	6 hours per day x 5 days per week x 38 weeks per year
Baseline Equipment Efficiency	100%		
Baseline Annual Electric Use	142,500	kWh	
Baseline Annual Electric Cost	\$29,078		
Proposed Equipment Efficiency	80%		Approxmiation
Proposed Fuel Use	4,862	Therms	Baseline Electric Use x 3,412 BTU/kWh / 100,000 BTU/Therm
Proposed Fuel Cost	\$ 4,818		
Annual Savings	\$24,259		
Natural Gas Equipment Project Cost	\$38,999		
Simple Payback	1.6	Years	

*Note to engineer: Link savings back to summary sheet in appropriate column.

Multipliers	
Material:	1.01
Labor:	1.25
Equipment:	1.00

ECM 9- Replace Electric Kitchen Equip. Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Commercial Double Stack Oven-Natural Gas	1	EA	\$ 5,500	\$ 500	\$ -	\$ 5,577	\$ 623	\$ -	\$ 6,200	
Commercial Range-Natural Gas	1	EA	\$ 2,500	\$ 500	\$ -	\$ 2,535	\$ 623	\$ -	\$ 3,158	
Commercial Tabletop Steamer-Natural Gas	1	EA	\$ 1,000	\$ 500	\$ -	\$ 1,014	\$ 623	\$ -	\$ 1,637	
Dishwasher Booster Heater-Natural Gas	1	EA	\$ 10,000	\$ 2,500	\$ -	\$ 10,140	\$ 3,113	\$ -	\$ 13,253	
Natural Gas Hookup	1	LS	\$ 2,000	\$ 5,000	\$ -	\$ 2,028	\$ 6,225	\$ -	\$ 8,253	

\$ 32,499	Subtotal
\$ 6,499.80	20% Contingency
-	-
-	-
\$ 38,999	Total

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-4 Lighting Replacements

\$0.14 \$/kWh Consumption

\$6.56 \$/kW Demand

Field Code	Area Description	EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
		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
	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/Fixture) * (Fixture 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/Fixture) * (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
36	301	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	302	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
43	311	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	SW	2400	1,922	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	SW	2,400	1,922	-	0.0	\$ -	\$ -	\$0		
36	303	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
43	312	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	SW	2400	1,922	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	SW	2,400	1,922	-	0.0	\$ -	\$ -	\$0		
36	304	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
43	305	15	T 32 R F 3 (ELE)	F43ILL	89	1.3	SW	2400	3,204	15	T 32 R F 3 (ELE)	F43ILL	89	1.3	SW	2,400	3,204	-	0.0	\$ -	\$ -	\$0		
36	306	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	307	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	310	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	3rd Floor Hallways	17	S 34 P F 2 (MAG)	F42EE	72	1.2	SW	2280	2,791	17	C 28 P F 2	F42SSILL	48	0.8	SW	2,280	1,860	930	0.4	\$ 153.22	\$ 1,806.25	\$170	11.8	1.8
36	3rd Floor Storage 1	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
36	3th Floor Storage 2	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
36	3th Floor Storage 3	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
36	3th Floor Storage 4	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
36	3th Floor Storage 5	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
38	S308	2	F42ILL	F42ILL	59	0.1	SW	2400	283	2	F42ILL	F42ILL	59	0.1	SW	2,400	283	-	0.0	\$ -	\$ -	\$0		
36	Art	4	S 34 P F 2 (MAG)	F42EE	72	0.3	SW	2400	691	4	C 28 P F 2	F42SSILL	48	0.2	SW	2,400	461	230	0.1	\$ 37.94	\$ 425.00	\$40	11.2	1.7
36	3rd Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	SW	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$30	13.4	2.0
91	3rd Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450	3	CF 26	CFQ26/1-L	27	0.1	SW	2,000	162	288	0.1	\$ 47.47	\$ 15.00	\$0	0.3	0.1
36	3rd Floor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	SW	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$30	13.4	2.0
91	3rd Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300	2	CF 26	CFQ26/1-L	27	0.1	SW	2,000	108	192	0.1	\$ 31.64	\$ 10.00	\$0	0.3	0.1
36	3rd Floor Boy's Bathroom-Utility Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
34	3rd Floor Girl's Bathroom	1	S 32 R F 1	F41ILL	31	0.0	SW	2000	62	1	S 32 R F 1	F41ILL	31	0.0	SW	2,000	62	-	0.0	\$ -	\$ -	\$0		
34	3rd Floor Boy's Bathroom	1	S 32 R F 1	F41ILL	31	0.0	SW	2000	62	1	S 32 R F 1	F41ILL	31	0.0	SW	2,000	62	-	0.0	\$ -	\$ -	\$0		
43	313A	12	T 32 R F 3 (ELE)	F43ILL	89	1.1	SW	2400	2,563	12	T 32 R F 3 (ELE)	F43ILL	89	1.1	SW	2,400	2,563	-	0.0	\$ -	\$ -	\$0		
48	Stairway 1	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766	3	0	F44SSILL	96	0.3	SW	2,280	657	109	0.0	\$ 18.03	\$ 318.75	\$30	17.7	2.6
38	Stairway 1	2	F42ILL	F42ILL	59	0.1	SW	2280	269	2	F42ILL	F42ILL	59	0.1	SW	2,280	269	-	0.0	\$ -	\$ -	\$0		
48	Stairway 2	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766	3	0	F44SSILL	96	0.3	SW	2,280	657	109	0.0	\$ 18.03	\$ 318.75	\$30	17.7	2.6
38	Stairway 2	2	F42ILL	F42ILL	59	0.1	SW	2280	269	2	F42ILL	F42ILL	59	0.1	SW	2,280	269	-	0.0	\$ -	\$ -	\$0		
48	Stairway 3	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766	3	0	F44SSILL	96	0.3	SW	2,280	657	109	0.0	\$ 18.03	\$ 318.75	\$30	17.7	2.6
38	Stairway 3	2	F42ILL	F42ILL	59	0.1	SW	2280	269	2	F42ILL	F42ILL	59	0.1	SW	2,280	269	-	0.0	\$ -	\$ -	\$0		
48	Stairway 4	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766	3	0	F44SSILL	96	0.3	SW	2,280	657	109	0.0	\$ 18.03	\$ 318.75	\$30	17.7	2.6
38	Stairway 4	2	F42ILL	F42ILL	59	0.1	SW	2280	269	2	F42ILL	F42ILL	59	0.1	SW	2,280	269	-	0.0	\$ -	\$ -	\$0		
36	201	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	S201	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	2400	173	1	C 28 P F 2	F42SSILL	48	0.0	SW	2,400	115	58	0.0	\$ 9.49	\$ 106.25	\$10	11.2	1.7
38	Air Handler Closet	1	F42ILL	F42ILL	59	0.1	SW	1000	59	1	F42ILL	F42ILL	59	0.1	SW	1,000	59	-	0.0	\$ -	\$ -	\$0		
36	202	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
38	Air Handler Media Center	1	F42ILL	F42ILL	59	0.1	SW	1000	59	1	F42ILL	F42ILL	59	0.1	SW	1,000	59	-	0.0	\$ -	\$ -	\$0		
36	203	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	204	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	206	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-4 Lighting Replacements

\$0.14 \$/kWh Consumption

\$6.56 \$/kW Demand

Field Code	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 kWh Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
36	205	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	207	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
38	2nd Floor Hallway	30	F42ILL	F42ILL	59	1.8	SW	2280	4,036	30	F42ILL	F42ILL	59	1.8	SW	2,280	4,036	-	0.0	\$ -	\$ -	\$0		
36	208	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	209	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	SW	2,400	1,613	806	0.3	\$ 132.79	\$ 1,487.50	\$140	11.2	1.7
36	2nd Floor Storage 1	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
36	2nd Floor Storage 2	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
36	2nd Floor Storage 3	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
3	Entrance	2	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	2280	128	2	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	2,280	128	-	0.0	\$ -	\$ -	\$0		
36	2nd Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	SW	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$30	13.4	2.0
91	2nd Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450	3	CF 26	CFQ26/1-L	27	0.1	SW	2,000	162	288	0.1	\$ 47.47	\$ 15.00	\$0	0.3	0.1
36	2nd Floor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	SW	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$30	13.4	2.0
91	2nd Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300	2	CF 26	CFQ26/1-L	27	0.1	SW	2,000	108	192	0.1	\$ 31.64	\$ 10.00	\$0	0.3	0.1
36	Utility Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
46	210	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	2400	1,382	4	T 28 R F 4	F44SSILL	96	0.4	SW	2,400	922	461	0.2	\$ 75.88	\$ 525.00	\$40	6.9	1.1
46	210 Closet	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1000	144	1	T 28 R F 4	F44SSILL	96	0.1	SW	1,000	96	48	0.0	\$ 7.95	\$ 131.25	\$10	16.5	2.5
36	1st Floor Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0
36	3	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2400	518	3	C 28 P F 2	F42SSILL	48	0.1	SW	2,400	346	173	0.1	\$ 28.46	\$ 318.75	\$30	11.2	1.7
46	K1	12	T 34 R F 4 (MAG)	F44EE	144	1.7	SW	2400	4,147	12	T 28 R F 4	F44SSILL	96	1.2	SW	2,400	2,765	1,382	0.6	\$ 227.65	\$ 1,575.00	\$120	6.9	1.1
81	K1	3	I 120	I120/1	120	0.4	SW	2400	864	3	CF 26	CFQ26/1-L	27	0.1	SW	2,400	194	670	0.3	\$ 110.27	\$ 20.25	\$0	0.2	0.0
91	K1 Bathroom	1	I 75	I75/1	75	0.1	SW	2000	150	1	CF 26	CFQ26/1-L	27	0.0	SW	2,000	54	96	0.0	\$ 15.82	\$ 5.00	\$0	0.3	0.1
80	K1 Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400	2	CF 26	CFQ26/1-L	27	0.1	SW	2,000	108	292	0.1	\$ 48.12	\$ 13.50	\$0	0.3	0.0
81	School Entrance	13	I 120	I120/1	120	1.6	SW	2280	3,557	13	CF 26	CFQ26/1-L	27	0.4	SW	2,280	800	2,757	1.2	\$ 454.03	\$ 87.75	\$0	0.2	0.0
53	Media Center	6	F46ILL	F46ILL	175	1.1	SW	2400	2,520	6	F46ILL	F46ILL	175	1.1	SW	2,400	2,520	-	0.0	\$ -	\$ -	\$0		
102	Media Center	16	High Bay MH 400	MH400/1	458	7.3	SW	2400	17,587	16	C 54 C F 6	F46GHL	351	5.6	SW	2,400	13,478	4,109	1.7	\$ 676.62	\$ 8,200.00	\$1,600	12.1	1.6
81	Media Center	16	I 120	I120/1	120	1.9	SW	2400	4,608	16	CF 26	CFQ26/1-L	27	0.4	SW	2,400	1,037	3,571	1.5	\$ 588.09	\$ 108.00	\$0	0.2	0.0
36	K2	12	S 34 P F 2 (MAG)	F42EE	72	0.9	SW	2400	2,074	12	C 28 P F 2	F42SSILL	48	0.6	SW	2,400	1,382	691	0.3	\$ 113.82	\$ 1,275.00	\$120	11.2	1.7
36	Offices	7	S 34 P F 2 (MAG)	F42EE	72	0.5	SW	2400	1,210	7	C 28 P F 2	F42SSILL	48	0.3	SW	2,400	806	403	0.2	\$ 66.40	\$ 743.75	\$70	11.2	1.7
46	Offices	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	2400	2,074	6	T 28 R F 4	F44SSILL	96	0.6	SW	2,400	1,382	691	0.3	\$ 113.82	\$ 787.50	\$60	6.9	1.1
36	Nurse	4	S 34 P F 2 (MAG)	F42EE	72	0.3	SW	2400	691	4	C 28 P F 2	F42SSILL	48	0.2	SW	2,400	461	230	0.1	\$ 37.94	\$ 425.00	\$40	11.2	1.7
38	Nurse	2	F42ILL	F42ILL	59	0.1	SW	2400	283	2	F42ILL	F42ILL	59	0.1	SW	2,400	283	-	0.0	\$ -	\$ -	\$0		
46	Nurse	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	2400	1,037	3	T 28 R F 4	F44SSILL	96	0.3	SW	2,400	691	346	0.1	\$ 56.91	\$ 393.75	\$30	6.9	1.1
80	Nurse Bathroom	1	I 100	I100/1	100	0.1	SW	2000	200	1	CF 26	CFQ26/1-L	27	0.0	SW	2,000	54	146	0.1	\$ 24.06	\$ 6.75	\$0	0.3	0.0
81	Nurse Bathroom	1	I 120	I120/1	120	0.1	SW	2000	240	1	CF 26	CFQ26/1-L	27	0.0	SW	2,000	54	186	0.1	\$ 30.65	\$ 6.75	\$0	0.2	0.0
46	Conference Room	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	2400	1,037	3	T 28 R F 4	F44SSILL	96	0.3	SW	2,400	691	346	0.1	\$ 56.91	\$ 393.75	\$30	6.9	1.1
36	Conference Room	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	2400	173	1	C 28 P F 2	F42SSILL	48	0.0	SW	2,400	115	58	0.0	\$ 9.49	\$ 106.25	\$10	11.2	1.7
81	Gym	4	I 120	I120/1	120	0.5	SW	2400	1,152	4	CF 26	CFQ26/1-L	27	0.1	SW	2,400	259	893	0.4	\$ 147.02	\$ 27.00	\$0	0.2	0.0
53	Gym	24	F46ILL	F46ILL	175	4.2	SW	2400	10,080	24	F46ILL	F46ILL	175	4.2	SW	2,400	10,080	-	0.0	\$ -	\$ -	\$0		
81	Faculty Room	4	I 120	I120/1	120	0.5	SW	2400	1,152	4	CF 26	CFQ26/1-L	27	0.1	SW	2,400	259	893	0.4	\$ 147.02	\$ 27.00	\$0	0.2	0.0
46	Faculty Room	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	2400	2,074	6	T 28 R F 4	F44SSILL	96	0.6	SW	2,400	1,382	691	0.3	\$ 113.82	\$ 787.50	\$60	6.9	1.1
81	Men's Bathroom	3	I 120	I120/1	120	0.4	SW	2000	720	3	CF 26	CFQ26/1-L	27	0.1	SW	2,000	162	558	0.3	\$ 91.96	\$ 20.25	\$0	0.2	0.0
80	Men's Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400	2	CF 26	CFQ26/1-L	27	0.1	SW	2,000	108	292	0.1	\$ 48.12	\$ 13.50	\$0	0.3	0.0
81	Women's Bathroom	3	I 120	I120/1	120	0.4	SW	2000	720	3	CF 26	CFQ26/1-L	27	0.1	SW	2,000	162	558	0.3	\$ 91.96	\$ 20.25	\$0	0.2	0.0
80	Women's Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400	2	CF 26	CFQ26/1-L	27	0.1	SW	2,000	108	292	0.1	\$ 48.12	\$ 13.50	\$0	0.3	0.0
38	1st Floor Hallway	27	F42ILL	F42ILL	59	1.6	SW	2280	3,632	27	F42ILL	F42ILL	59	1.6	SW	2,280	3,632	-	0.0	\$ -	\$ -	\$0		

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-4 Lighting Replacements

\$0.14 \$/kWh Consumption

\$6.56 \$/kW Demand

EXISTING CONDITIONS										RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS							
Field Code	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	
	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/Fixture) * (Fixture 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/Fixture) * (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	
46	Media Center Office	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	2400	1,382	4	T 28 R F 4	F44SSILL	96	0.4	SW	2,400	922	461	0.2	\$ 75.88	\$ 525.00	\$40	6.9	1.1	
81	Media Center Office	2	I 120	I120/1	120	0.2	SW	2400	576	2	CF 26	CFQ26/1-L	27	0.1	SW	2,400	130	446	0.2	\$ 73.51	\$ 13.50	\$0	0.2	0.0	
38	Main Offices	2	F42ILL	F42ILL	59	0.1	SW	2400	283	2	F42ILL	F42ILL	59	0.1	SW	2,400	283	-	0.0	\$ -	\$ -	\$0			
81	Main Offices	4	I 120	I120/1	120	0.5	SW	2400	1,152	4	CF 26	CFQ26/1-L	27	0.1	SW	2,400	259	893	0.4	\$ 147.02	\$ 27.00	\$0	0.2	0.0	
46	Kitchen	10	T 34 R F 4 (MAG)	F44EE	144	1.4	SW	1600	2,304	10	T 28 R F 4	F44SSILL	96	1.0	SW	1,600	1,536	768	0.5	\$ 126.73	\$ 1,312.50	\$100	10.4	1.6	
48	Kitchen	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	0	F44SSILL	96	0.1	SW	1,600	154	26	0.0	\$ 4.22	\$ 106.25	\$10	25.2	3.8	
46	Kitchen Closet	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1000	288	2	T 28 R F 4	F44SSILL	96	0.2	SW	1,000	192	96	0.1	\$ 15.90	\$ 262.50	\$20	16.5	2.5	
38	Gym Office	2	F42ILL	F42ILL	59	0.1	SW	2400	283	2	F42ILL	F42ILL	59	0.1	SW	2,400	283	-	0.0	\$ -	\$ -	\$0			
81	Gym Storage	8	I 120	I120/1	120	1.0	SW	1000	960	8	CF 26	CFQ26/1-L	27	0.2	SW	1,000	216	744	0.7	\$ 123.22	\$ 54.00	\$0	0.4	0.1	
61	Boiler Room	9	S 60 C F 2 (ELE) 8'	F82EE	123	1.1	SW	1000	1,107	9	T 28 R F 1	F44SSILL	96	0.9	SW	1,000	864	243	0.2	\$ 40.25	\$ 1,275.75	\$90	31.7	4.9	
36	1st Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	SW	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$30	13.4	2.0	
91	1st Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450	3	CF 26	CFQ26/1-L	27	0.1	SW	2,000	162	288	0.1	\$ 47.47	\$ 15.00	\$0	0.3	0.1	
36	1st loor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	SW	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$30	13.4	2.0	
91	1st Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300	2	CF 26	CFQ26/1-L	27	0.1	SW	2,000	108	192	0.1	\$ 31.64	\$ 10.00	\$0	0.3	0.1	
36	Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	\$ 3.97	\$ 106.25	\$10	26.7	4.0	
107	Exterior	8	250 W Mercury Vapor	MV250/1	290	2.3	SW	5000	11,600	8	FXLED78	FXLED78/1	78	0.6	SW	5,000	3,120	8,480	1.7	\$ 1,393.47	\$ -	\$0	0.0	0.0	
Total		638				64.4			151,849	638			6,079	43.9			101,710	50,139	20.5	\$8,256	\$50,284	\$5,360			
Demand Savings																					20.5	\$1,616			
kWh Savings																					50,139	\$6,769			
Total savings																						\$8,385		6.0	5.4

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-5 Install Occupancy Sensors

\$0.14 \$/kWh Consumption

\$6.56 \$/kW Demand

Field Code	Area Description	EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
		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 Without Incentive	Simple Payback
	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 annual hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(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
36	301	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	302	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
43	311	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	SW	2400	1,922.4	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	OSR	1680	1,345.7	576.7	0.0	\$94.58	\$300.00	\$70.00	3.2	2.4
36	303	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
43	312	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	SW	2400	1,922.4	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	OSR	1680	1,345.7	576.7	0.0	\$94.58	\$300.00	\$70.00	3.2	2.4
36	304	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
43	305	15	T 32 R F 3 (ELE)	F43ILL	89	1.3	SW	2400	3,204.0	15	T 32 R F 3 (ELE)	F43ILL	89	1.3	OSR	1680	2,242.8	961.2	0.0	\$157.64	\$300.00	\$70.00	1.9	1.5
36	306	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	307	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	310	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	3rd Floor Hallways	17	S 34 P F 2 (MAG)	F42EE	72	1.2	SW	2280	2,790.7	17	S 34 P F 2 (MAG)	F42EE	72	1.2	N/A	2280	2,790.7	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	3rd Floor Storage 1	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
36	3th Floor Storage 2	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
36	3th Floor Storage 3	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
36	3th Floor Storage 4	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
36	3th Floor Storage 5	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
38	S308	2	F42ILL	F42ILL	59	0.1	SW	2400	283.2	2	F42ILL	F42ILL	59	0.1	OSR	1680	198.2	85.0	0.0	\$13.93	\$150.00	\$35.00	10.8	8.3
36	Art	4	S 34 P F 2 (MAG)	F42EE	72	0.3	SW	2400	691.2	4	S 34 P F 2 (MAG)	F42EE	72	0.3	OSR	1680	483.8	207.4	0.0	\$34.01	\$150.00	\$35.00	4.4	3.4
36	3rd Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432.0	3	S 34 P F 2 (MAG)	F42EE	72	0.2	N/A	2000	432.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
91	3rd Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450.0	3	I 75	I75/1	75	0.2	N/A	2000	450.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	3rd Floor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432.0	3	S 34 P F 2 (MAG)	F42EE	72	0.2	N/A	2000	432.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
91	3rd Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300.0	2	I 75	I75/1	75	0.2	N/A	2000	300.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	3rd Floor Boy's Bathroom-Utility Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
34	3rd Floor Girl's Bathroom	1	S 32 R F 1	F41ILL	31	0.0	SW	2000	62.0	1	S 32 R F 1	F41ILL	31	0.0	N/A	2000	62.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
34	3rd Floor Boy's Bathroom	1	S 32 R F 1	F41ILL	31	0.0	SW	2000	62.0	1	S 32 R F 1	F41ILL	31	0.0	N/A	2000	62.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
43	313A	12	T 32 R F 3 (ELE)	F43ILL	89	1.1	SW	2400	2,563.2	12	T 32 R F 3 (ELE)	F43ILL	89	1.1	OSR	1680	1,794.2	769.0	0.0	\$126.11	\$300.00	\$70.00	2.4	1.8
48	Stairway 1	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766.1	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	N/A	2280	766.1	0.0	0.0	\$0.00	\$0.00	\$0.00		
38	Stairway 1	2	F42ILL	F42ILL	59	0.1	SW	2280	269.0	2	F42ILL	F42ILL	59	0.1	N/A	2280	269.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
48	Stairway 2	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766.1	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	N/A	2280	766.1	0.0	0.0	\$0.00	\$0.00	\$0.00		
38	Stairway 2	2	F42ILL	F42ILL	59	0.1	SW	2280	269.0	2	F42ILL	F42ILL	59	0.1	N/A	2280	269.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
48	Stairway 3	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766.1	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	N/A	2280	766.1	0.0	0.0	\$0.00	\$0.00	\$0.00		
38	Stairway 3	2	F42ILL	F42ILL	59	0.1	SW	2280	269.0	2	F42ILL	F42ILL	59	0.1	N/A	2280	269.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
48	Stairway 4	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766.1	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	N/A	2280	766.1	0.0	0.0	\$0.00	\$0.00	\$0.00		
38	Stairway 4	2	F42ILL	F42ILL	59	0.1	SW	2280	269.0	2	F42ILL	F42ILL	59	0.1	N/A	2280	269.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	201	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	S201	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	2400	172.8	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	1680	121.0	51.8	0.0	\$8.50	\$150.00	\$35.00	17.6	13.5
38	Air Handler Closet	1	F42ILL	F42ILL	59	0.1	SW	1000	59.0	1	F42ILL	F42ILL	59	0.1	OSR	250	14.8	44.3	0.0	\$7.26	\$150.00	\$35.00	20.7	15.8
36	202	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
38	Air Handler Media Center	1	F42ILL	F42ILL	59	0.1	SW	1000	59.0	1	F42ILL	F42ILL	59	0.1	OSR	250	14.8	44.3	0.0	\$7.26	\$150.00	\$35.00	20.7	15.8
36	203	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	204	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-5 Install Occupancy Sensors

\$0.14 \$/kWh Consumption

\$6.56 \$/kW Demand

Field Code	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 Without Incentive	Simple Payback
36	206	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	205	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	207	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
38	2nd Floor Hallway	30	F42ILL	F42ILL	59	1.8	SW	2280	4,035.6	30	F42ILL	F42ILL	59	1.8	N/A	2280	4,035.6	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	208	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	209	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419.2	14	S 34 P F 2 (MAG)	F42EE	72	1.0	OSR	1680	1,693.4	725.8	0.0	\$119.02	\$300.00	\$70.00	2.5	1.9
36	2nd Floor Storage 1	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
36	2nd Floor Storage 2	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
36	2nd Floor Storage 3	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
3	Entrance	2	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	2280	127.7	2	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	N/A	2280	127.7	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	2nd Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432.0	3	S 34 P F 2 (MAG)	F42EE	72	0.2	N/A	2000	432.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
91	2nd Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450.0	3	I 75	I75/1	75	0.2	N/A	2000	450.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	2nd Floor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432.0	3	S 34 P F 2 (MAG)	F42EE	72	0.2	N/A	2000	432.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
91	2nd Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300.0	2	I 75	I75/1	75	0.2	N/A	2000	300.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	Utility Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
46	210	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	2400	1,382.4	4	T 34 R F 4 (MAG)	F44EE	144	0.6	OSR	1680	967.7	414.7	0.0	\$68.01	\$300.00	\$70.00	4.4	3.4
46	210 Closet	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1000	144.0	1	T 34 R F 4 (MAG)	F44EE	144	0.1	OSR	250	36.0	108.0	0.0	\$17.71	\$150.00	\$35.00	8.5	6.5
36	1st Floor Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
36	3	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2400	518.4	3	S 34 P F 2 (MAG)	F42EE	72	0.2	OSR	1680	362.9	155.5	0.0	\$25.51	\$150.00	\$35.00	5.9	4.5
46	K1	12	T 34 R F 4 (MAG)	F44EE	144	1.7	SW	2400	4,147.2	12	T 34 R F 4 (MAG)	F44EE	144	1.7	OSR	1680	2,903.0	1,244.2	0.0	\$204.04	\$150.00	\$35.00	0.7	0.6
81	K1	3	I 120	I120/1	120	0.4	SW	2400	864.0	3	I 120	I120/1	120	0.4	OSR	1680	604.8	259.2	0.0	\$42.51	\$150.00	\$35.00	3.5	2.7
91	K1 Bathroom	1	I 75	I75/1	75	0.1	SW	2000	150.0	1	I 75	I75/1	75	0.1	N/A	2000	150.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
80	K1 Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400.0	2	I 100	I100/1	100	0.2	N/A	2000	400.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
81	School Entrance	13	I 120	I120/1	120	1.6	SW	2280	3,556.8	13	I 120	I120/1	120	1.6	N/A	2280	3,556.8	0.0	0.0	\$0.00	\$0.00	\$0.00		
53	Media Center	6	F46ILL	F46ILL	175	1.1	SW	2400	2,520.0	6	F46ILL	F46ILL	175	1.1	OSR	1680	1,764.0	756.0	0.0	\$123.98	\$450.00	\$105.00	3.6	2.8
102	Media Center	16	High Bay MH 400	MH400/1	458	7.3	SW	2400	17,587.2	16	High Bay MH 400	MH400/1	458	7.3	OSR	1680	12,311.0	5,276.2	0.0	\$865.29	\$450.00	\$105.00	0.5	0.4
81	Media Center	16	I 120	I120/1	120	1.9	SW	2400	4,608.0	16	I 120	I120/1	120	1.9	OSR	1680	3,225.6	1,382.4	0.0	\$226.71	\$150.00	\$35.00	0.7	0.5
36	K2	12	S 34 P F 2 (MAG)	F42EE	72	0.9	SW	2400	2,073.6	12	S 34 P F 2 (MAG)	F42EE	72	0.9	OSR	1680	1,451.5	622.1	0.0	\$102.02	\$300.00	\$70.00	2.9	2.3
36	Offices	7	S 34 P F 2 (MAG)	F42EE	72	0.5	SW	2400	1,209.6	7	S 34 P F 2 (MAG)	F42EE	72	0.5	OSR	1200	604.8	604.8	0.0	\$99.19	\$150.00	\$35.00	1.5	1.2
46	Offices	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	2400	2,073.6	6	T 34 R F 4 (MAG)	F44EE	144	0.9	OSR	1200	1,036.8	1,036.8	0.0	\$170.04	\$150.00	\$35.00	0.9	0.7
36	Nurse	4	S 34 P F 2 (MAG)	F42EE	72	0.3	SW	2400	691.2	4	S 34 P F 2 (MAG)	F42EE	72	0.3	OSR	1200	345.6	345.6	0.0	\$56.68	\$150.00	\$35.00	2.6	2.0
38	Nurse	2	F42ILL	F42ILL	59	0.1	SW	2400	283.2	2	F42ILL	F42ILL	59	0.1	OSR	1200	141.6	141.6	0.0	\$23.22	\$0.00	\$0.00	0.0	0.0
46	Nurse	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	2400	1,036.8	3	T 34 R F 4 (MAG)	F44EE	144	0.4	OSR	1200	518.4	518.4	0.0	\$85.02	\$0.00	\$0.00	0.0	0.0
80	Nurse Bathroom	1	I 100	I100/1	100	0.1	SW	2000	200.0	1	I 100	I100/1	100	0.1	N/A	2000	200.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
81	Nurse Bathroom	1	I 120	I120/1	120	0.1	SW	2000	240.0	1	I 120	I120/1	120	0.1	N/A	2000	240.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
46	Conference Room	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	2400	1,036.8	3	T 34 R F 4 (MAG)	F44EE	144	0.4	OSR	1200	518.4	518.4	0.0	\$85.02	\$150.00	\$35.00	1.8	1.4
36	Conference Room	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	2400	172.8	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	1200	86.4	86.4	0.0	\$14.17	\$0.00	\$0.00	0.0	0.0
81	Gym	4	I 120	I120/1	120	0.5	SW	2400	1,152.0	4	I 120	I120/1	120	0.5	OSR	1680	806.4	345.6	0.0	\$56.68	\$150.00	\$35.00	2.6	2.0
53	Gym	24	F46ILL	F46ILL	175	4.2	SW	2400	10,080.0	24	F46ILL	F46ILL	175	4.2	OSR	1680	7,056.0	3,024.0	0.0	\$495.94	\$750.00	\$175.00	1.5	1.2
81	Faculty Room	4	I 120	I120/1	120	0.5	SW	2400	1,152.0	4	I 120	I120/1	120	0.5	OSR	1200	576.0	576.0	0.0	\$94.46	\$150.00	\$35.00	1.6	1.2
46	Faculty Room	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	2400	2,073.6	6	T 34 R F 4 (MAG)	F44EE	144	0.9	OSR	1200	1,036.8	1,036.8	0.0	\$170.04	\$0.00	\$0.00	0.0	0.0
81	Men's Bathroom	3	I 120	I120/1	120	0.4	SW	2000	720.0	3	I 120	I120/1	120	0.4	N/A	2000	720.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
80	Men's Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400.0	2	I 100	I100/1	100	0.2	N/A	2000	400.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
81	Women's Bathroom	3	I 120	I120/1	120	0.4	SW	2000	720.0	3	I 120	I120/1	120	0.4	N/A	2000	720.0	0.0	0.0	\$0.00	\$0.00	\$0.00		

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-5 Install Occupancy Sensors

\$0.14 \$/kWh Consumption

\$6.56 \$/kW Demand

Field Code	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 Without Incentive	Simple Payback
80	Women's Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400.0	2	I 100	I100/1	100	0.2	N/A	2000	400.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
38	1st Floor Hallway	27	F42ILL	F42ILL	59	1.6	SW	2280	3,632.0	27	F42ILL	F42ILL	59	1.6	N/A	2280	3,632.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
46	Media Center Office	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	2400	1,382.4	4	T 34 R F 4 (MAG)	F44EE	144	0.6	OSR	1200	691.2	691.2	0.0	\$113.36	\$150.00	\$35.00	1.3	1.0
81	Media Center Office	2	I 120	I120/1	120	0.2	SW	2400	576.0	2	I 120	I120/1	120	0.2	OSR	1200	288.0	288.0	0.0	\$47.23	\$0.00	\$0.00	0.0	0.0
38	Main Offices	2	F42ILL	F42ILL	59	0.1	SW	2400	283.2	2	F42ILL	F42ILL	59	0.1	OSR	1200	141.6	141.6	0.0	\$23.22	\$150.00	\$35.00	6.5	5.0
81	Main Offices	4	I 120	I120/1	120	0.5	SW	2400	1,152.0	4	I 120	I120/1	120	0.5	OSR	1200	576.0	576.0	0.0	\$94.46	\$150.00	\$35.00	1.6	1.2
46	Kitchen	10	T 34 R F 4 (MAG)	F44EE	144	1.4	SW	1600	2,304.0	10	T 34 R F 4 (MAG)	F44EE	144	1.4	OSR	1200	1,728.0	576.0	0.0	\$94.46	\$150.00	\$35.00	1.6	1.2
48	Kitchen	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179.2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	OSR	1200	134.4	44.8	0.0	\$7.35	\$150.00	\$35.00	20.4	15.7
46	Kitchen Closet	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1000	288.0	2	T 34 R F 4 (MAG)	F44EE	144	0.3	OSR	250	72.0	216.0	0.0	\$35.42	\$150.00	\$35.00	4.2	3.2
38	Gym Office	2	F42ILL	F42ILL	59	0.1	SW	2400	283.2	2	F42ILL	F42ILL	59	0.1	OSR	1200	141.6	141.6	0.0	\$23.22	\$150.00	\$35.00	6.5	5.0
81	Gym Storage	8	I 120	I120/1	120	1.0	SW	1000	960.0	8	I 120	I120/1	120	1.0	OSR	250	240.0	720.0	0.0	\$118.08	\$150.00	\$35.00	1.3	1.0
61	Boiler Room	9	S 60 C F 2 (ELE) 8'	F82EE	123	1.1	SW	1000	1,107.0	9	S 60 C F 2 (ELE) 8'	F82EE	123	1.1	OSR	250	276.8	830.3	0.0	\$136.16	\$450.00	\$105.00	3.3	2.5
36	1st Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432.0	3	S 34 P F 2 (MAG)	F42EE	72	0.2	N/A	2000	432.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
91	1st Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450.0	3	I 75	I75/1	75	0.2	N/A	2000	450.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	1st loor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432.0	3	S 34 P F 2 (MAG)	F42EE	72	0.2	N/A	2000	432.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
91	1st Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300.0	2	I 75	I75/1	75	0.2	N/A	2000	300.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
36	Utility Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	S 34 P F 2 (MAG)	F42EE	72	0.1	OSR	250	18.0	54.0	0.0	\$8.86	\$150.00	\$35.00	16.9	13.0
107	Exterior	8	250 W Mercury Vapor	MV250/1	290	2.3	SW	5000	11,600.0	8	250 W Mercury Vapor	MV250/1	290	2.3	N/A	5000	11,600.0	0.0	0.0	\$0.00	\$0.00	\$0.00		
Total		638				64.4			151,849	638			64				113,595	38,255	0	6,274	\$14,100	3,290		

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-6 Lighting Replacements with Occupancy Sensors

\$0.14 \$/kWh Consumption

\$6.56 \$/kW Demand

Field Code	Area Description	EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
		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
	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
36	301	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,487.50	\$ 210	7.0	6.0
36	302	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
43	311	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	SW	2400	1,922	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	OSR	1,680	1,346	577	0.0	\$ 94.58	\$ 300.00	\$ 70	3.2	2.4
36	303	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
43	312	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	SW	2400	1,922	9	T 32 R F 3 (ELE)	F43ILL	89	0.8	OSR	1,680	1,346	577	0.0	\$ 94.58	\$ 300.00	\$ 70	3.2	2.4
36	304	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
43	305	15	T 32 R F 3 (ELE)	F43ILL	89	1.3	SW	2400	3,204	15	T 32 R F 3 (ELE)	F43ILL	89	1.3	OSR	1,680	2,243	961	0.0	\$ 157.64	\$ 300.00	\$ 70	1.9	1.5
36	306	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	307	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	310	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	3rd Floor Hallways	17	S 34 P F 2 (MAG)	F42EE	72	1.2	SW	2280	2,791	17	C 28 P F 2	F42SSILL	48	0.8	N/A	2,280	1,860	930	0.4	\$ 153.22	\$ 1,806.25	\$ 170	11.8	10.7
36	3rd Floor Storage 1	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
36	3th Floor Storage 2	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
36	3th Floor Storage 3	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
36	3th Floor Storage 4	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
36	3th Floor Storage 5	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
38	S308	2	F42ILL	F42ILL	59	0.1	SW	2400	283	2	F42ILL	F42ILL	59	0.1	OSR	1,680	198	85	0.0	\$ 13.93	\$ 150.00	\$ 35	10.8	8.3
36	Art	4	S 34 P F 2 (MAG)	F42EE	72	0.3	SW	2400	691	4	C 28 P F 2	F42SSILL	48	0.2	OSR	1,680	323	369	0.1	\$ 60.61	\$ 575.00	\$ 75	9.5	8.2
36	3rd Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	N/A	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$ 30	13.4	12.2
91	3rd Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450	3	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	162	288	0.1	\$ 47.47	\$ 15.00	\$ -	0.3	0.3
36	3rd Floor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	N/A	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$ 30	13.4	12.2
91	3rd Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300	2	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	108	192	0.1	\$ 31.64	\$ 10.00	\$ -	0.3	0.3
36	3rd Floor Boy's Bathroom-Utility Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
34	3rd Floor Girl's Bathroom	1	S 32 R F 1	F41ILL	31	0.0	SW	2000	62	1	S 32 R F 1	F41ILL	31	0.0	N/A	2,000	62	-	0.0	\$ -	\$ -	\$ -	-	-
34	3rd Floor Boy's Bathroom	1	S 32 R F 1	F41ILL	31	0.0	SW	2000	62	1	S 32 R F 1	F41ILL	31	0.0	N/A	2,000	62	-	0.0	\$ -	\$ -	\$ -	-	-
43	313A	12	T 32 R F 3 (ELE)	F43ILL	89	1.1	SW	2400	2,563	12	T 32 R F 3 (ELE)	F43ILL	89	1.1	OSR	1,680	1,794	769	0.0	\$ 126.11	\$ 300.00	\$ 70	2.4	1.8
48	Stairway 1	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766	3	0	F44SSILL	96	0.3	N/A	2,280	657	109	0.0	\$ 18.03	\$ 318.75	\$ 30	17.7	16.0
38	Stairway 1	2	F42ILL	F42ILL	59	0.1	SW	2280	269	2	F42ILL	F42ILL	59	0.1	N/A	2,280	269	-	0.0	\$ -	\$ -	\$ -	-	-
48	Stairway 2	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766	3	0	F44SSILL	96	0.3	N/A	2,280	657	109	0.0	\$ 18.03	\$ 318.75	\$ 30	17.7	16.0
38	Stairway 2	2	F42ILL	F42ILL	59	0.1	SW	2280	269	2	F42ILL	F42ILL	59	0.1	N/A	2,280	269	-	0.0	\$ -	\$ -	\$ -	-	-
48	Stairway 3	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766	3	0	F44SSILL	96	0.3	N/A	2,280	657	109	0.0	\$ 18.03	\$ 318.75	\$ 30	17.7	16.0
38	Stairway 3	2	F42ILL	F42ILL	59	0.1	SW	2280	269	2	F42ILL	F42ILL	59	0.1	N/A	2,280	269	-	0.0	\$ -	\$ -	\$ -	-	-
48	Stairway 4	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2280	766	3	0	F44SSILL	96	0.3	N/A	2,280	657	109	0.0	\$ 18.03	\$ 318.75	\$ 30	17.7	16.0
38	Stairway 4	2	F42ILL	F42ILL	59	0.1	SW	2280	269	2	F42ILL	F42ILL	59	0.1	N/A	2,280	269	-	0.0	\$ -	\$ -	\$ -	-	-
36	201	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	S201	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	2400	173	1	C 28 P F 2	F42SSILL	48	0.0	OSR	1,680	81	92	0.0	\$ 15.15	\$ 256.25	\$ 45	16.9	13.9
38	Air Handler Closet	1	F42ILL	F42ILL	59	0.1	SW	1000	59	1	F42ILL	F42ILL	59	0.1	OSR	250	15	44	0.0	\$ 7.26	\$ 150.00	\$ 35	20.7	15.8
36	202	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
38	Air Handler Media Center	1	F42ILL	F42ILL	59	0.1	SW	1000	59	1	F42ILL	F42ILL	59	0.1	OSR	250	15	44	0.0	\$ 7.26	\$ 150.00	\$ 35	20.7	15.8
36	203	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	204	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	206	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	205	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-6 Lighting Replacements with Occupancy Sensors

\$0.14 \$/kWh Consumption

\$6.56 \$/kW Demand

Field Code	Area Description	EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
		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 Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
36	207	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
38	2nd Floor Hallway	30	F42ILL	F42ILL	59	1.8	SW	2280	4,036	30	F42ILL	F42ILL	59	1.8	N/A	2,280	4,036	-	0.0	\$ -	\$ -	\$ -		
36	208	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	209	14	S 34 P F 2 (MAG)	F42EE	72	1.0	SW	2400	2,419	14	C 28 P F 2	F42SSILL	48	0.7	OSR	1,680	1,129	1,290	0.3	\$ 212.14	\$ 1,787.50	\$ 210	8.4	7.4
36	2nd Floor Storage 1	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
36	2nd Floor Storage 2	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
36	2nd Floor Storage 3	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
3	Entrance	2	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	2280	128	2	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	N/A	2,280	128	-	0.0	\$ -	\$ -	\$ -		
36	2nd Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	N/A	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$ 30	13.4	12.2
91	2nd Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450	3	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	162	288	0.1	\$ 47.47	\$ 15.00	\$ -	0.3	0.3
36	2nd Floor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	N/A	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$ 30	13.4	12.2
91	2nd Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300	2	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	108	192	0.1	\$ 31.64	\$ 10.00	\$ -	0.3	0.3
36	Utility Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
46	210	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	2400	1,382	4	T 28 R F 4	F44SSILL	96	0.4	OSR	1,680	645	737	0.2	\$ 121.22	\$ 825.00	\$ 110	6.8	5.9
46	210 Closet	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1000	144	1	T 28 R F 4	F44SSILL	96	0.1	OSR	250	24	120	0.0	\$ 19.76	\$ 281.25	\$ 45	14.2	12.0
36	1st Floor Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
36	3	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2400	518	3	C 28 P F 2	F42SSILL	48	0.1	OSR	1,680	242	276	0.1	\$ 45.46	\$ 468.75	\$ 65	10.3	8.9
46	K1	12	T 34 R F 4 (MAG)	F44EE	144	1.7	SW	2400	4,147	12	T 28 R F 4	F44SSILL	96	1.2	OSR	1,680	1,935	2,212	0.6	\$ 363.67	\$ 1,725.00	\$ 155	4.7	4.3
81	K1	3	I 120	I120/1	120	0.4	SW	2400	864	3	CF 26	CFQ26/1-L	27	0.1	OSR	1,680	136	728	0.3	\$ 119.83	\$ 170.25	\$ 35	1.4	1.1
91	K1 Bathroom	1	I 75	I75/1	75	0.1	SW	2000	150	1	CF 26	CFQ26/1-L	27	0.0	N/A	2,000	54	96	0.0	\$ 15.82	\$ 5.00	\$ -	0.3	0.3
80	K1 Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400	2	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	108	292	0.1	\$ 48.12	\$ 13.50	\$ -	0.3	0.3
81	School Entrance	13	I 120	I120/1	120	1.6	SW	2280	3,557	13	CF 26	CFQ26/1-L	27	0.4	N/A	2,280	800	2,757	1.2	\$ 454.03	\$ 87.75	\$ -	0.2	0.2
53	Media Center	6	F46ILL	F46ILL	175	1.1	SW	2400	2,520	6	F46ILL	F46ILL	175	1.1	OSR	1,680	1,764	756	0.0	\$ 123.98	\$ 450.00	\$ 105	3.6	2.8
102	Media Center	16	High Bay MH 400	MH400/1	458	7.3	SW	2400	17,587	16	C 54 C F 6	F46GHL	351	5.6	OSR	1,680	9,435	8,152	1.7	#####	\$ 8,650.00	\$ 1,705	6.5	5.2
81	Media Center	16	I 120	I120/1	120	1.9	SW	2400	4,608	16	CF 26	CFQ26/1-L	27	0.4	OSR	1,680	726	3,882	1.5	\$ 639.10	\$ 258.00	\$ 35	0.4	0.3
36	K2	12	S 34 P F 2 (MAG)	F42EE	72	0.9	SW	2400	2,074	12	C 28 P F 2	F42SSILL	48	0.6	OSR	1,680	968	1,106	0.3	\$ 181.84	\$ 1,575.00	\$ 190	8.7	7.6
36	Offices	7	S 34 P F 2 (MAG)	F42EE	72	0.5	SW	2400	1,210	7	C 28 P F 2	F42SSILL	48	0.3	OSR	1,200	403	806	0.2	\$ 132.52	\$ 893.75	\$ 105	6.7	6.0
46	Offices	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	2400	2,074	6	T 28 R F 4	F44SSILL	96	0.6	OSR	1,200	691	1,382	0.3	\$ 227.18	\$ 937.50	\$ 95	4.1	3.7
36	Nurse	4	S 34 P F 2 (MAG)	F42EE	72	0.3	SW	2400	691	4	C 28 P F 2	F42SSILL	48	0.2	OSR	1,200	230	461	0.1	\$ 75.73	\$ 575.00	\$ 75	7.6	6.6
38	Nurse	2	F42ILL	F42ILL	59	0.1	SW	2400	283	2	F42ILL	F42ILL	59	0.1	OSR	1,200	142	142	0.0	\$ 23.22	\$ -	\$ -	0.0	0.0
46	Nurse	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	2400	1,037	3	T 28 R F 4	F44SSILL	96	0.3	OSR	1,200	346	691	0.1	\$ 113.59	\$ 393.75	\$ 30	3.5	3.2
80	Nurse Bathroom	1	I 100	I100/1	100	0.1	SW	2000	200	1	CF 26	CFQ26/1-L	27	0.0	N/A	2,000	54	146	0.1	\$ 24.06	\$ 6.75	\$ -	0.3	0.3
81	Nurse Bathroom	1	I 120	I120/1	120	0.1	SW	2000	240	1	CF 26	CFQ26/1-L	27	0.0	N/A	2,000	54	186	0.1	\$ 30.65	\$ 6.75	\$ -	0.2	0.2
46	Conference Room	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	2400	1,037	3	T 28 R F 4	F44SSILL	96	0.3	OSR	1,200	346	691	0.1	\$ 113.59	\$ 543.75	\$ 65	4.8	4.2
36	Conference Room	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	2400	173	1	C 28 P F 2	F42SSILL	48	0.0	OSR	1,200	58	115	0.0	\$ 18.93	\$ 106.25	\$ 10	5.6	5.1
81	Gym	4	I 120	I120/1	120	0.5	SW	2400	1,152	4	CF 26	CFQ26/1-L	27	0.1	OSR	1,680	181	971	0.4	\$ 159.77	\$ 177.00	\$ 35	1.1	0.9
53	Gym	24	F46ILL	F46ILL	175	4.2	SW	2400	10,080	24	F46ILL	F46ILL	175	4.2	OSR	1,680	7,056	3,024	0.0	\$ 495.94	\$ 750.00	\$ 175	1.5	1.2
81	Faculty Room	4	I 120	I120/1	120	0.5	SW	2400	1,152	4	CF 26	CFQ26/1-L	27	0.1	OSR	1,200	130	1,022	0.4	\$ 168.28	\$ 177.00	\$ 35	1.1	0.8
46	Faculty Room	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	2400	2,074	6	T 28 R F 4	F44SSILL	96	0.6	OSR	1,200	691	1,382	0.3	\$ 227.18	\$ 787.50	\$ 60	3.5	3.2
81	Men's Bathroom	3	I 120	I120/1	120	0.4	SW	2000	720	3	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	162	558	0.3	\$ 91.96	\$ 20.25	\$ -	0.2	0.2
80	Men's Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400	2	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	108	292	0.1	\$ 48.12	\$ 13.50	\$ -	0.3	0.3
81	Women's Bathroom	3	I 120	I120/1	120	0.4	SW	2000	720	3	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	162	558	0.3	\$ 91.96	\$ 20.25	\$ -	0.2	0.2
80	Women's Bathroom	2	I 100	I100/1	100	0.2	SW	2000	400	2	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	108	292	0.1	\$ 48.12	\$ 13.50	\$ -	0.3	0.3
38	1st Floor Hallway	27	F42ILL	F42ILL	59	1.6	SW	2280	3,632	27	F42ILL	F42ILL	59	1.6	N/A	2,280	3,632	-	0.0	\$ -	\$ -	\$ -		
46	Media Center Office	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	2400	1,382	4	T 28 R F 4	F44SSILL	96	0.4	OSR	1,200	461	922	0.2	\$ 151.45	\$ 675.00	\$ 75	4.5	4.0

Energy Audit of Lennox Elementary School

CHA Project No.24698

Cost of Electricity: \$0.164 \$/kWh Blended

ECM-6 Lighting Replacements with Occupancy Sensors

\$0.14 \$/kWh Consumption

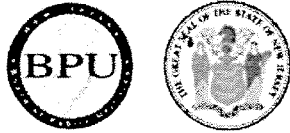
\$6.56 \$/kW Demand

Field Code	Area Description	EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
		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
81	Media Center Office	2	I 120	I120/1	120	0.2	SW	2400	576	2	CF 26	CFQ26/1-L	27	0.1	OSR	1,200	65	511	0.2	\$ 84.14	\$ 13.50	\$ -	0.2	0.2
38	Main Offices	2	F42ILL	F42ILL	59	0.1	SW	2400	283	2	F42ILL	F42ILL	59	0.1	OSR	1,200	142	142	0.0	\$ 23.22	\$ 150.00	\$ 35	6.5	5.0
81	Main Offices	4	I 120	I120/1	120	0.5	SW	2400	1,152	4	CF 26	CFQ26/1-L	27	0.1	OSR	1,200	130	1,022	0.4	\$ 168.28	\$ 177.00	\$ 35	1.1	0.8
46	Kitchen	10	T 34 R F 4 (MAG)	F44EE	144	1.4	SW	1600	2,304	10	T 28 R F 4	F44SSILL	96	1.0	OSR	1,200	1,152	1,152	0.5	\$ 189.71	\$ 1,462.50	\$ 135	7.7	7.0
48	Kitchen	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	0	F44SSILL	96	0.1	OSR	1,200	115	64	0.0	\$ 10.52	\$ 256.25	\$ 45	24.4	20.1
46	Kitchen Closet	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1000	288	2	T 28 R F 4	F44SSILL	96	0.2	OSR	250	48	240	0.1	\$ 39.52	\$ 412.50	\$ 55	10.4	9.0
38	Gym Office	2	F42ILL	F42ILL	59	0.1	SW	2400	283	2	F42ILL	F42ILL	59	0.1	OSR	1,200	142	142	0.0	\$ 23.22	\$ 150.00	\$ 35	6.5	5.0
81	Gym Storage	8	I 120	I120/1	120	1.0	SW	1000	960	8	CF 26	CFQ26/1-L	27	0.2	OSR	250	54	906	0.7	\$ 149.79	\$ 204.00	\$ 35	1.4	1.1
61	Boiler Room	9	S 60 C F 2 (ELE) 8'	F82EE	123	1.1	SW	1000	1,107	9	T 28 R F 1	F44SSILL	96	0.9	OSR	250	216	891	0.2	\$ 146.52	\$ 1,725.75	\$ 195	11.8	10.4
36	1st Floor Girl's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	N/A	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$ 30	13.4	12.2
91	1st Floor Girl's Bathroom	3	I 75	I75/1	75	0.2	SW	2000	450	3	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	162	288	0.1	\$ 47.47	\$ 15.00	\$ -	0.3	0.3
36	1st loor Boy's Bathroom	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	C 28 P F 2	F42SSILL	48	0.1	N/A	2,000	288	144	0.1	\$ 23.73	\$ 318.75	\$ 30	13.4	12.2
91	1st Floor Boy's Bathroom	2	I 75	I75/1	75	0.2	SW	2000	300	2	CF 26	CFQ26/1-L	27	0.1	N/A	2,000	108	192	0.1	\$ 31.64	\$ 10.00	\$ -	0.3	0.3
36	Utility Closet	1	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	C 28 P F 2	F42SSILL	48	0.0	OSR	250	12	60	0.0	\$ 9.88	\$ 256.25	\$ 45	25.9	21.4
107	Exterior	8	Vapor	MV250/1	290	2.3	SW	5000	11,600	8	FXLED78	FXLED78/1	78	0.6	N/A	5,000	3,120	8,480	1.7	#####	\$ -	\$ -	0.0	0.0
S	Total	638				64.4			151,849	638						74,989		20.5	12,638	\$ 64,084	\$8,650			
S																			20.5	\$1,616				
S																			76,860	\$10,376				
S																				\$11,992		5.3	4.6	

APPENDIX D

**New Jersey Pay For Performance
Incentive Program**

HOME RESIDENTIAL **COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT** RENEWABLES



COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

EXISTING BUILDINGS

PARTICIPATION STEPS

APPLICATIONS AND FORMS

APPROVED PARTNERS

NEW CONSTRUCTION

FAQS

BECOME A PARTNER

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PILOT

ENERGY SAVINGS IMPROVEMENT PLAN

DIRECT INSTALL

ARRA

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

TEACH

EDA PROGRAMS

TECHNOLOGIES

TOOLS AND RESOURCES

PROGRAM UPDATES

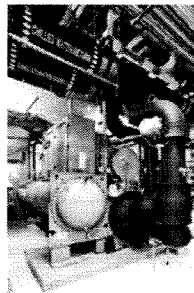
Home » Commercial & Industrial » Programs » Pay for Performance

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 facilities and earn incentives that are directly linked to your savings. Pay for Performance relies on a network of program partners who provide technical services under direct contract to you. Acting as your energy expert, your partner will develop an energy reduction plan for each project with a whole-building technical component of a traditional energy audit, a financial plan for funding the energy efficient measures and a construction schedule for installation.



Eligibility

Existing commercial, industrial and institutional buildings with a peak demand over 100 kW for any of the preceding twelve months are eligible to participate including hotels and casinos, large office buildings, multi-family buildings, supermarkets, manufacturing facilities, schools, shopping malls and restaurants. Buildings that fall into the following five customer classes are not required to meet the 100 kW demand in order

to participate in the program: hospitals, public colleges and universities, 501(c)(3) non-profits, affordable multifamily housing, and local governmental entities. Your energy reduction plan must 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, manufacturing, water treatment and datacenter building types whose annual energy consumption is heavily weighted on process loads. Details are available in the high energy intensity section of the FAQ 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 in your facilities and comparing it to similar buildings. That can be a big help in locating opportunities for cost-justified energy efficiency upgrades. And, based on our findings, you may be invited to participate in the Building Performance with ENERGY STAR initiative and receive special recognition as an industry leader in energy efficiency.

Incentives

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

Incentive #1 - Submittal of complete energy reduction plan prepared by an approved program partner - Contingent on moving forward, incentives will be between \$5,000 and \$50,000 based on approximately \$.10 per square foot, not to exceed 50% of the facility's 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 paid based on actual savings, provided that the minimum performance threshold of 15% savings has been achieved.



Program

Large Scale CHI Program Annour

2012 Large Ene Announcement

Economic Devel Introduces Revc Pay for Perform:

Incentives Now . Screw-in Lamps

Other updates pos

Featured Story

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A detailed Incentive Structure document is available on the applications and forms page.

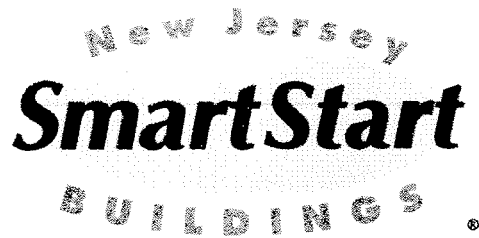
Energy Efficiency Revolving Loan Fund (EE RLF)

New Jersey-based commercial, institutional or industrial entities (including 501(c)(3) organizations) that have received an approved energy reduction plan under Pay for Performance may be eligible for supplemental financing through the EE RLF. The financing, in the form of low-interest loans, can be used to support up to 80% of total eligible project costs, not to exceed \$2.5 million or 100% of total eligible project costs from all public state funding sources. Visit the NJ EDA website for details.

Steps to Participation

[Click here](#) for a step-by-step description of the program.

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2012 PAY FOR PERFORMANCE PROGRAM Existing Buildings Incentive Structure

Incentive #1: Energy Reduction Plan

Incentive Amount:..... \$0.10 per sq ft
Minimum Incentive:..... \$5,000
Maximum Incentive:..... \$50,000 or 50% of facility annual energy cost (whichever is less)

This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP) and is paid upon ERP approval. Incentive is contingent on implementation of recommended measures outlined in the ERP.

Incentive #2: Installation of Recommended Measures

Minimum Performance Target:..... 15%

Electric Incentives

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 per projected kWh saved

Gas Incentives

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

This incentive is based on projected energy savings outlined in the ERP. Incentive is paid upon successful installation of recommended measures.

Incentive #3: Post-Construction Benchmarking Report

Minimum Performance Target:..... 15%

Electric Incentives

Base Incentive based on 15% savings:.....\$0.09 per actual kWh saved
For each % over 15% add:.....\$0.005 per actual kWh saved
Maximum Incentive:.....\$0.11 per actual kWh saved

Gas Incentives

Base Incentive based on 15% savings:.....\$0.90 per actual Therm saved
For each % over 15% add:.....\$0.05 per actual Therm saved
Maximum Incentive:.....\$1.25 per actual Therm saved

Incentive Cap: 25% of total project cost

This incentive will be released upon submittal of a Post-Construction Benchmarking Report that verifies that the level of savings actually achieved by the installed measures meets or exceeds the minimum performance threshold. To validate the savings and achievement of the Energy Target, the EPA Portfolio Manager shall be used. Savings should be rounded to the nearest percent. Total value of Incentive #2 and Incentive #3 may not exceed 50% of the total project cost. Incentives will be limited to \$1 million per gas and electric account per building; maximum of \$2 million per project. See Participation Agreement for details.

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 governments or non-profit organizations. Values used in this calculation are for measures with a positive return on investment (ROI) only.

Total Building Area (Square Feet)	44,140	Incentive #1		
Is this audit funded by NJ BPU (Y/N)	Yes	Audit is funded by NJ BPU	\$0.10	\$/sqft

Board of Public Utilities (BPU)

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	\$48,962	\$20,493
Existing Usage (from utility)	298,720	20,493
Proposed Savings	315,673	-3,095
Existing Total MMBtus	3,069	
Proposed Savings MMBtus	768	
% Energy Reduction	25.0%	
Proposed Annual Savings	\$54,100	

	Min (Savings = 15%)		Increase (Savings >		Max Incentive		Achieved	
	\$/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	\$34,724	-\$3,868	\$30,856
Incentive #3	\$34,724	-\$3,868	\$30,856
Total All Incentives	\$69,448	-\$7,736	\$66,712

Total Project Cost	\$175,041
---------------------------	-----------

	Allowable Incentive	
% Incentives #1 of Utility Cost*	7.2%	\$5,000
% Incentives #2 of Project Cost**	17.6%	\$30,856
% Incentives #3 of Project Cost**	17.6%	\$30,856
Total Eligible Incentives***	\$66,712	
Project Cost w/ Incentives	\$108,329	

Project Payback (years)	
w/o Incentives	w/ Incentives
3.2	2.0

* 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

APPENDIX E

Energy Savings Improvement Plan (ESIP)



Your Power to Save
At Home, for Business, and for the Future

HOME

RESIDENTIAL

COMMERCIAL, INDUSTRIAL
AND LOCAL GOVERNMENT

RENEWABLE ENERGY


[Home](#) » [Commercial & Industrial](#) » [Programs](#)

Energy Savings Improvement Plan

A new State law 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 "Energy Savings Improvement Program" (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.

This [Local Finance Notice](#) outlines how local governments can develop and implement an ESIP for their facilities. Below are two sample RFPs:

- [Local Government](#)
- [School Districts \(K-12\)](#)

The Board also adopted [protocols](#) to measure energy savings.

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. Local units considering an ESIP should carefully review the Local Finance Notice, the law, and consult with qualified professionals to determine how they should approach the task.

FIRST STEP – ENERGY AUDIT

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. As explained in the Local Finance Notice, this may be done internally if an agency has qualified staff to conduct the audit. If not, the audit must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

Pursuing a [Local Government Energy Audit](#) through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach - and it's free. **Incentives provide 100% of the cost of the audit.**

ENERGY REDUCTION PLANS

If you have an ESIP plan you would like to submit to the Board of Public Utilities, please email it 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 \(180 MB - Right Click, Save As\)](#)

Program Updates

- [Board Order - Standby Charges for Distributed Generation Customers](#)
 - [T-12 Schools Lighting Replacement Initiative - Funding Allocation Reached](#)
- [Other updates posted.](#)

Featured Success Story

Rutgers University:
Continued Commitment to Saving Energy



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COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

PROGRAMS

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- ▶ [PAY FOR PERFORMANCE](#)
- ▶ [COMBINED HEAT & POWER AND FUEL CELLS](#)
- ▶ [LOCAL GOVERNMENT ENERGY AUDIT](#)
- ▶ [LARGE ENERGY USERS PILOT](#)
- ▶ [ENERGY SAVINGS IMPROVEMENT PLAN](#)
- ▶ [DIRECT INSTALL](#)
- ▶ [ENERGY BENCHMARKING](#)
- ▶ [T-12 SCHOOLS LIGHTING INITIATIVE](#)
- ▶ [OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS](#)
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APPENDIX F

Photovoltaic (PV) Rooftop Solar Power Generation

Photovoltaic (PV) Solar Power Generation - Screening Assessment

**Pompton Lakes Public Schools
Lenox Avenue Elementary School**

Cost of Electricity	\$0.164	/kWh
Electricity Usage	298,720	kWh/yr
System Unit Cost	\$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
	\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$360,000	90.0	117,300	0	\$19,237	0	\$19,237	\$0	\$7,038	18.7	13.7

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= \$60 /1000kwh

Area Output*

1,828 m2
19,677 ft2

Perimeter Output*

164 m
538 ft

Available Roof Space for PV:

(Area Output - 10 ft x Perimeter) x 85%
12,155 ft2

Approximate System Size:

Is the roof flat? (Yes/No)

Yes

8 watt/ft2
97,239 DC watts
90 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	07442	Enter into PV Watts
DC/AC Derate Factor	0.83	Enter into PV Watts

PV Watts Output

117,300 annual kWh calculated in PV Watts program

% Offset Calc

Usage	298,720 (from utilities)
PV Generation	117,300 (generated using PV Watts)
% offset	39%

* <http://www.freemaptools.com/area-calculator.htm>
 ** <http://www.fletexchange.com>
 *** http://gisatnrel.nrel.gov/PVWatts_View/index.html





AC Energy & Cost Savings



(Type comments here to appear on printout; maximum 1 row of 90 characters.)

Station Identification		Results			
Cell ID:	0268370	Month	Solar Radiation (kWh/m ² /day)	AC Energy (kWh)	Energy Value (S)
State:	New Jersey	1	2.65	6287	1031.07
Latitude:	40.9 ° N	2	3.47	7446	1221.14
Longitude:	74.2 ° W	3	4.83	11051	1812.36
PV System Specifications		4	5.28	11328	1857.79
DC Rating:	90.0 kW	5	5.93	12924	2119.54
DC to AC Derate Factor:	0.830	6	6.32	12977	2128.23
AC Rating:	74.7 kW	7	5.87	12215	2003.26
Array Type:	Fixed Tilt	8	5.55	11629	1907.16
Array Tilt:	20.0 °	9	5.04	10409	1707.08
Array Azimuth:	180.0 °	10	4.14	9153	1501.09
Energy Specifications		11	2.82	6147	1008.11
Cost of Electricity:	16.4 ¢/kWh	12	2.46	5734	940.38
		Year	4.54	117300	19237.20

APPENDIX G

EPA Portfolio Manager



STATEMENT OF ENERGY PERFORMANCE

Lenox Elementary School

Building ID: 3310479
For 12-month Period Ending: August 31, 2012¹
Date SEP becomes ineligible: N/A

Date SEP Generated: October 25, 2012

Facility
 Lenox Elementary School
 40 Mill Street
 Pompton Lakes, NJ 07442

Facility Owner
 N/A

Primary Contact for this Facility
 N/A

Year Built: 1938
Gross Floor Area (ft²): 44,140

Energy Performance Rating² (1-100) 47

Site Energy Use Summary³

Electricity - Grid Purchase(kBtu)	1,019,233
Natural Gas (kBtu) ⁴	2,099,917
Total Energy (kBtu)	3,119,150

Energy Intensity⁴

Site (kBtu/ft ² /yr)	71
Source (kBtu/ft ² /yr)	127

Emissions (based on site energy use)

Greenhouse Gas Emissions (MtCO ₂ e/year)	256
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Electric Distribution Utility

Jersey Central Power & Light Co [FirstEnergy Corp]

National Median Comparison

National Median Site EUI	69
National Median Source EUI	124
% Difference from National Median Source EUI	2%
Building Type	K-12 School

Stamp of Certifying Professional

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

Meets Industry Standards⁵ for Indoor Environmental Conditions:

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

Certifying Professional

N/A

Notes:

1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Values represent energy intensity, annualized to a 12-month period.
5. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR[®] Data Checklist for Commercial Buildings

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

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.

NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	<input checked="" type="checkbox"/>
Building Name	Lenox Elementary School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		<input type="checkbox"/>
Type	K-12 School	Is this an accurate description of the space in question?		<input type="checkbox"/>
Location	40 Mill Street, Pompton Lakes, NJ 07442	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		<input type="checkbox"/>
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of a hospital, k-12 school, hotel and senior care facility) nor can they be submitted as representing only a portion of a building.		<input type="checkbox"/>
Lenox Elementary School (K-12 School)				
CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	<input checked="" type="checkbox"/>
Gross Floor Area	44,140 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		<input type="checkbox"/>
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select "yes" for open weekends. The "yes" response should apply whether the building is open for one or both of the weekend days.		<input type="checkbox"/>
Number of PCs	66	Is this the number of personal computers in the K12 School?		<input type="checkbox"/>
Number of walk-in refrigeration/freezer units	1	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		<input type="checkbox"/>
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		<input type="checkbox"/>
Percent Cooled	10 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		<input type="checkbox"/>
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		<input type="checkbox"/>
Months	10(Optional)	Is this school in operation for at least 8 months of the year?		<input type="checkbox"/>

High School?	No	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		<input type="checkbox"/>
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ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Jersey Central Power & Light Co [FirstEnergy Corp]

Fuel Type: Electricity		
Meter: Electric Meter (kWh (thousand Watt-hours)) Space(s): Entire Facility Generation Method: Grid Purchase		
Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
08/01/2012	08/31/2012	27,200.00
07/01/2012	07/31/2012	14,560.00
06/01/2012	06/30/2012	25,600.00
05/01/2012	05/31/2012	24,320.00
04/01/2012	04/30/2012	28,800.00
03/01/2012	03/31/2012	28,160.00
02/01/2012	02/29/2012	26,880.00
01/01/2012	01/31/2012	26,880.00
12/01/2011	12/31/2011	29,120.00
11/01/2011	11/30/2011	19,920.00
10/01/2011	10/31/2011	19,920.00
09/01/2011	09/30/2011	27,360.00
Electric Meter Consumption (kWh (thousand Watt-hours))		298,720.00
Electric Meter Consumption (kBtu (thousand Btu))		1,019,232.64
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		1,019,232.64
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		<input type="checkbox"/>
Fuel Type: Natural Gas		
Meter: Natural Gas (therms) Space(s): Entire Facility		
Start Date	End Date	Energy Use (therms)
07/11/2012	08/10/2012	36.00
06/11/2012	07/10/2012	43.00
05/11/2012	06/10/2012	61.00
04/11/2012	05/10/2012	598.00
03/11/2012	04/10/2012	1,929.00
02/11/2012	03/10/2012	4,317.00
01/11/2012	02/10/2012	4,752.00
12/11/2011	01/10/2012	4,492.00
11/11/2011	12/10/2011	2,887.00
10/11/2011	11/10/2011	1,283.00

09/11/2011	10/10/2011	59.00
Natural Gas Consumption (therms)		20,457.00
Natural Gas Consumption (kBtu (thousand Btu))		2,045,700.00
Total Natural Gas Consumption (kBtu (thousand Btu))		2,045,700.00
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		<input type="checkbox"/>

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	<input type="checkbox"/>

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

Certifying Professional

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

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

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

Facility
Lenox Elementary School
40 Mill Street
Pompton Lakes, NJ 07442

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Lenox Elementary School	
Gross Floor Area Excluding Parking: (ft ²)	44,140
Year Built	1938
For 12-month Evaluation Period Ending Date:	August 31, 2012

Facility Space Use Summary

Lenox Elementary School	
Space Type	K-12 School
Gross Floor Area (ft ²)	44,140
Open Weekends?	No
Number of PCs	66
Number of walk-in refrigeration/freezer units	1
Presence of cooking facilities	Yes
Percent Cooled	10
Percent Heated	100
Months °	10
High School?	No
School District °	Pompton Lakes

Energy Performance Comparison

Performance Metrics	Evaluation Periods		Comparisons		
	Current (Ending Date 08/31/2012)	Baseline (Ending Date 08/31/2012)	Rating of 75	Target	National Median
Energy Performance Rating	47	47	75	N/A	50
Energy Intensity					
Site (kBtu/ft ²)	71	71	54	N/A	69
Source (kBtu/ft ²)	127	127	97	N/A	124
Energy Cost					
\$/year	\$ 69,224.97	\$ 69,224.97	\$ 53,030.68	N/A	\$ 67,804.42
\$/ft ² /year	\$ 1.57	\$ 1.57	\$ 1.20	N/A	\$ 1.54
Greenhouse Gas Emissions					
MtCO ₂ e/year	256	256	196	N/A	251
kgCO ₂ e/ft ² /year	6	6	5	N/A	6

More than 50% of your building is defined as K-12 School. Please note that your rating accounts for all of the spaces listed. The National Median column presents energy performance data your building would have if your building had a median rating of 50.

Notes:

o - This attribute is optional.

d - A default value has been supplied by Portfolio Manager.