PENNS GROVE – CARNEYS POINT REGIONAL SCHOOL DISTRICT
PAUL W. CARLETON ELEMENTARY SCHOOL
ENERGY ASSESSMENT

for

NEW JERSEY
BOARD OF PUBLIC UTILITIES

CHA PROJECT NO. 24510

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REPORT DISCLAIMER

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

A thorough walkthrough of the facility 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 facility staff and spot measurements taken in the field.

1.0 EXECUTIVE SUMMARY

The Penns Grove – Carneys Point Regional School District recently engaged CHA to perform an energy audit in connection with the New Jersey Board of Public Utilities' Local Government Energy Audit Program. This report details the results of the energy audit conducted for:

Building Name	Address	Square Feet	Construction Date
Paul W. Carleton Elementary School	251 Maple Avenue Penns Grove, New Jersey	40,875 2,400 12,240	Original: 1951 Addition: 1982 Addition: 2001

The Energy Conservation Measures (ECMs) identified in this report will allow for a more efficient use of energy and if pursued have the opportunity to qualify for the New Jersey SmartStart Buildings Program and/or Direct Install Program. Potential annual savings of $17,000 for the recommended ECMs may be realized with a payback of 7.2 years. A summary of the costs, savings, and paybacks for the recommended ECMs follows:

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	Replace Steam to Hot Water Boiler-Heat Exchanger System with Condensing Hot Water Boiler	1,050,000	5,800	>20	1,800	>20	
2	Replace Domestic Water Heater	17,000	3,500	4.8	300	4.9	X
3	Replace Exterior Door Seals & Sweeps	5,000	500	10.0	0	10.0	X
4	Replace Rooftop Units w/ Higher EER Rooftop Units	33,000	200	>20	1,000	>20	
5	Replace Electric Dishwasher Booster Heater w/ Natural Gas	15,000	1,700	8.8	0	8.8	X
6	Lighting Replacements (Select Areas)	73,000	7,300	10.0	4,800	9.3	
7	Lighting Controls (Select Areas)	12,000	7,300	1.6	2,100	1.4	
8	Lighting Replacements & Controls (Select Areas)	85,000	11,300	7.5	6,900	6.9	X
9	Water Conservation (Low Flow Fixtures)	97,000	1,400	>20	0	>20	

2.0 INTRODUCTION AND BACKGROUND

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.

The Paul W. Carleton Elementary School in Penns Grove, NJ, is a 55,515 square foot two story stand-alone building with mixed masonry construction. It is a brick structure containing classrooms, reception/office areas, library, kitchen, high bay cafeteria, high bay gymnasium and restrooms. Some HVAC rooftop units are utilized in various parts of the school. The building was originally constructed in 1951 with the first addition added in 1982 and a second built in 2001. Occupancy includes approximately 350 students and 51 faculty members. The building operates Monday through Friday from 7:30 am to approximately 4:00 pm and the custodians are working until 11:00. The building is closed on the weekends and occupancy levels are reduced in summer months between each school year.

3.0 EXISTING CONDITIONS

3.1 Building - General

Originally built in 1951, the Paul W. Carleton Elementary School is a combined 55,515 square foot building including one addition in 1982 and another in 2001. It is two story red brick building with classrooms, reception/office areas, a kitchen, high bay cafeteria, high bay gymnasium, restrooms, and storage and misc. areas. The main entrance is a store front glass door with metal frame that opens into the hallway near the main office area on the south west side of the building.

The Paul W. Carleton Elementary building has approximately 350 school children and 51 faculty and staff; the building was empty during our field inspection, but is typically used year round for school functions and some programs during the summer months. The building can be assumed to be fully occupied until 7:30 am to 4:00 pm during the week. The hours of operation are:

- Monday thru Friday 7:30 am to 4:00 pm
- Monday thru Friday 7:30 am to 11:00 pm (custodians)

The building is constructed of a mix of brick and masonry materials; finished exteriors are a brick veneer. Insulation is incorporated into the wall assemblies for an improved envelope. The majority of the interior walls are metal studs filled with fiberglass insulation finished with gypsum board are used. The flat roof system is comprised of a structural steel framing with a metal deck having rigid foam board insulation with a dark colored EPDM membrane. There is an overhang on the building front (south façade), and on the east and west classroom wall windows. Windows are double pane set in aluminum frames with minimal glazing. The main entrance doors are part glass, part metal panel with metal frames. The majority of the two story building is 30’ in height. The first floor areas have concrete slab-on-grade floors.

3.2 Utility Usage

The utility consumption for the school includes electricity, natural gas and potable water. Electricity is delivered by Atlantic City Electric and supplied by New Energy Inc and South Jersey Electric Company (during the billed period). Natural gas is delivered by South Jersey Gas and supplied by third party Woodruff Energy. Potable water is provided by the municipally owned water department at a charge.

For the 12-month period ranging from July 2011 through June 2012, the utilities usage for the building was as follows:

Actual Cost & Site Usage by Utility

Electric		
Annual Usage	280,440	kWh/yr
Annual Cost	40,128	$
Blended Rate	0.143	$/kWh
Consumption Rate	0.107	$/kWh
Demand Rate	6.01	$/kW
Peak Demand	120.0	kW
Min. Demand	119.2	kW
Avg. Demand	119.8	kW
Natural Gas		
Annual Usage	19,167	Therms/yr
Annual Cost	20,523	$
Rate	1.071	$/Therms
Water		
Annual Usage	596,000	gallons/yr
Annual Cost	2,718	$
Rate	8.198	$/gallon

Electrical usage remained fairly constant all year round. Natural gas consumption was highest in winter months for heating. See Appendix A for a detailed utility analysis.

Under New Jersey's energy deregulation law, the supply portion of the electric (or natural gas) bill is separated from the delivery portion. 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. See Appendix A for a list of third-party energy suppliers licensed by the Board of Public Utilities to sell within the building's service area.

3.3 HVAC Systems

3.3.1 Heating Hot Water System

The main source of the buildings heating is a H.B. Smith gas fired steam boiler rated at 5,268 MBH maximum(134 BHP). This boiler and associated steam appurtenances serve the original 1951 two story portion of the building and were installed in 1986. The low pressure steam serves classroom unit ventilators and other terminal units. Also located in the boiler room is a steam to hot water heat exchanger. The steam transfers heat energy within the heat exchanger to create heating hot water that is pumped to unit ventilators and other hydronic equipment located in the 2001 additions. Approximately 75% of the building is still served by the steam heating system.

3.3.2 Package Cooling and Heating Rooftop Units

Four (4) Trane heating and cooling packaged roof top units (RTUs) serve the 2001 addition HVAC needs. one 12 ton cooling only, one 7 ton cooling /electric heating, one 5 ton cooling/electric heating and one 2.5 ton cooling only units are located on the rooftop above the areas/spaces that they serve. The units supply cooling as well as electric supplemental heating to specific areas. Each RTU is mounted on a curb and has an outside air intake hood. Supply and return ductwork is routed down through the roof curbs to duct distribution systems above the ceilings to each space.

3.4 Control Systems

The building controls systems are made up of a pneumatic system for the heating and individual thermostats to the units for each classroom for air conditioning. A standalone Johnson Controls DDC system is installed to maintain control of the boiler steam to hot water system.

3.5 Lighting/Electrical Systems

The facility primarily utilizes fixtures with fluorescent T-8 32 watt lamps with electronic ballasts; compact fluorescent lamps and older style incandescent lamps are also used in select areas. High pressure sodium lighting is used in the gymnasium and for outdoor lighting and ranges from 150 to 400 watt fixtures. The primary sources of control for the lights are switches manually turned off at the end of the day.

Exterior lights consist of wall pack high pressure sodium fixtures on daylight sensors and timers. The wall pack lights are powered by the building's electrical system and are part of the lighting systems analysis.

3.6 Plumbing Systems

3.6.1 Domestic Hot Water System

A gym storage room contains one Bradford White 50 gallon electric tank type hot water heater rated at 4.5 kW and the kitchen contains a Bradford White 120 gallon electric tank type hot water heater rated at 18 kW. Hot water is provided to lavatories, the kitchen and sinks in custodial closets. The majority of hot water piping appears to be insulated. Domestic hot water temperature is maintained at 140°F.

3.6.2 Plumbing Fixtures

The building's lavatories, water closets, and urinals are original and are lower flow plumbing fixtures, and do not require upgrades. On average faucets have a flow rate of 1.5 gallons per minute (gpm), urinals consume approximately 2.5 gallons per flush (gpf) and toilets typically use 3.5 gpf. It was determined that there are 27 faucets, 5 urinals and 24 toilets within the facility.

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

4.0 ENERGY CONSERVATION MEASURES

4.1 ECM-1 Replace Steam Heating System with Hot Water System

The main source of the buildings heating is an HB Smith gas fired steam boiler which provides steam to the majority of the building. Approximately 25% of the school is heated using a steam to hot water heat exchanger. The boiler is non-condensing and has an estimated efficiency of 80%. Due to the inefficiency of the steam system, the estimated system efficiency was de-rated to 65%.

Due to the low efficiency of the existing steam system, an evaluation was performed for replacing the steam boiler and steam unit ventilators and associated piping with two (2) high efficiency condensing boilers , pumps, hot water unit ventilators and hot water distribution system. The existing hot water distribution system will be retained, less the heat exchanger.

The boiler fuel consumption was calculated from the natural gas used annually for the shoulder months per utility bills and boiler efficiency. This was then compared to the efficiency of a new condensing boiler at the improved operating efficiency. The difference in fuel usage was the savings.

Natural gas-fired boilers have an expected life of 25 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 112,500 therms and $112,500.

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

ECM-1 **Replace Steam to Hot Water Boiler-Heat Exchanger System with Condensing Hot Water Boiler**

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
1,050,000	0	0	4,500	5,800	0	5,800	1.3	1,800	>20	>20

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

This measure is not recommended due to the long payback, however the this ECM should be considered when it becomes necessary to replace the steam boiler.

4.2 ECM-2 Replace Domestic Hot Water Heaters

A gym storage room contains one Bradford White 50 gallon electric tank type hot water heater and the kitchen contains a Bradford White 120 gallon electric tank type hot water heater. During periods of little or no domestic hot water use, the units must still heat the water within their storage tank. Energy required maintaining the amount of hot water temperature set point during times of zero demand is known as standby losses; replacing these units with higher efficiency natural gas units was evaluated.

According to the U.S. Department of Energy, 2.5% of stored capacity is lost every hour during HW heater standby. This value was applied to the total volume of the existing DHW heater storage tank to determine the annual standby losses. Proposed efficiency was based on a typical , high efficiency tankless, condensing hot water heater; it was calculated that 600 therms of natural gas would be used per year. The new water heater will require gas and water piping modifications, venting, and electrical connections.

Domestic hot water heaters have an expected life of 12 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 413,000 kWh, -10,320 therms (the value is negative as the new system will be natural gas instead of electric and $52,700.

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

ECM-2 Replace Domestic Water Heaters

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Incentive *	Payback (without incentive)	Payback (with incentive)
	Electric kWh	Electric kW	Nat Gas Therms	Total $						
$					$	$		$	Years	Years
17,000	23,400	0	-600	3,500	0	3,500	10.5	300	4.8	4.9

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

This measure is recommended.

4.3 ECM-3 Replace Exterior Door Seals & Sweeps

The exterior doors have a 3/8" gap between the two leafs permitting outdoor air to infiltrate the building which adds load to the HVAC. This ECM includes adding new door seals and door sweeps to these main entrance doors to reduce the amount of infiltration.

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

ECM-3 Replace Exterior Door Seals & Sweeps

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Nat Gas	Total						
$	kW	kWh	Therms	$	$	$		$	Years	Years
5,000	0	0	500	500	0	500	(0.5)	0	10.0	10.0

* Incentive not applicable for this measure.

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This measure is recommended.

4.4 ECM-4 Replace Rooftop Units w/ Higher EER Rooftop Units

Existing Trane rooftop units provide DX cooling and electric heating to various areas in the school. Replacement of the rooftop units with more modern units with higher operating efficiencies was assessed.

The assumption of this calculation is that the operating hours and capacities of all the equipment stay the same. The energy savings are the result of operating higher efficiency units.

Split systems units have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 21,000 kWh and $3,000.

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

ECM-4 Replace Rooftop Units w/ Higher EER Rooftop Units

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
33,000	1,400	0	0	200	0	200	(0.9)	1,000	>20	>20

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

This measure is not recommended.

4.5 ECM-5 Replace Electric Booster Heater w/ Natural Gas

The facility uses a Hatco 45 kW electric hot water booster heater four hours per day for 180 days per year for disinfecting dishes. Utilizing a natural gas replacement for the heater 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.

Natural gas heaters have an expected life of 12 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 272,100 kWh, -11,000 therms (the unit is negative as the system will change from electric to natural gas), and $55,700.

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

ECM-5 Replace Electric Dishwasher Booster Heater w/ Natural Gas

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
$	kW	kWh	Therms	Kgals	$	$	$		$	Years	Years
15,000	50	22,700	-1,000	0	1,700	0	1,700	3.5	0	8.8	8.8

* Does not qualify for an Incentive per the New Jersey SmartStart Program. See section 5.0 for other incentive opportunities.

This measure is recommended.

4.6 ECM-6 Lighting Replacements/Upgrades

The Paul W. Carleton Elementary School utilizes mainly 32 watt T-8 fluorescent bulbs with electronic ballasts. The gymnasium and exterior lighting contain high pressure sodium lighting ranging from 150 to 400 watt fixtures. There is an opportunity to continue to reduce that consumption even more by upgrading the classrooms to super T-8 fixtures and the metal halides in the high bay areas to higher efficiency fluorescent 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 56,800 kWh. Supporting calculations, including assumptions for lighting hours and annual energy usage for each fixture, are provided in Appendix C.

Lighting has an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 851,000 kWh and $110,200.

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

ECM-6 Lighting Replacement / Upgrades

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
73,000	56,800	0	0	7,300	0	7,300	0.5	4,800	10.0	9.3

* 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-8.

4.7 ECM-7 Lighting Controls

The current Paul W. Carleton Elementary School lighting is mostly controlled by manual switches. Lights are generally turned on in the morning and shut off at night. During occupied times, there are rooms that are not occupied, however the lights remain on. Adding occupancy controls to the individual rooms will automatically control the lights based on occupancy. The occupancy sensor can be wall mounted near the switch or placed at the ceiling for larger room coverage. All occupancy sensors are equipped with a manual override feature. These sensors are generally not recommended in public toilet rooms.

Lighting controls have an expected life of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 765,000 kWh and $109,500.

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

ECM-7 Install Lighting Controls (Occupancy Sensors)

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
12,000	51,000	0	0	7,300	0	7,300	8.2	2,100	1.6	1.4

* 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-8.

4.8 ECM-8 Lighting Replacements/Upgrades & Controls (Select Areas)

Due to interactive effects, the energy and cost savings for occupancy sensors and lighting upgrades are not cumulative. This measure is a combination of ECM-6 and ECM-7 to reflect actual expected energy and demand reduction.

The lighting retrofits and controls have an expected lifetime of 15 years, according to the manufacturer, and total energy savings over the life of the project are estimated at 1,409,000 kWh and $169,900.

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

ECM-8 Lighting Replacements & Lighting Controls (Occupancy Sensors)

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
85,000	93,900	0	0	11.300	0	11,300	1.0	6,900	7.5	6.9

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

This measure is recommended.

4.9 ECM-9 Water Conservation (Low Flow Fixtures)

Faucets, toilets and urinals installed before the mid-90s consume more water than modern plumbing fixtures. On average faucets have a flow rate of 1.5 gallons per minute (gpm), urinals consume approximately 2.5 gallons per flush (gpf) and toilets typically use 3.5 gpf. It was determined that there are 27 faucets, 5 urinals and 24 toilets within the facility. Per building

occupancy, it was estimated that each toilet and faucet is utilized approximately nine times per day.

The water savings associated from replacing these fixtures with low-flow fixtures was calculated by taking the difference of the annual water usage for the proposed and base case. The basis of this calculation is the number of times each fixture is used, gallons per use, and number of fixtures. Replacing the existing fixtures in the restrooms with 0.5 gpm faucets, 0.5 gpf urinals and 1.28 gpf toilets would save $2,900 annually.

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

ECM-9 Water Conservation (Low Flow Fixture Replacement)

Budgetary Cost	Annual Utility Savings					Estimated Maintenance Savings	Total Savings	ROI	Potential Incentive*	Payback (without Incentive)	Payback (with Incentive)
	Electricity		Natural Gas	Water	Total						
$	kW	kWh	Therms	Kgals	$	$	$		$	Years	Years
97,000	0	0	0	350	1,400	0	1,400	(0.0)	0	>20	>20

* Incentive not applicable for this measure.

This measure is not 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

Incentives #2 and #3 can be combined to yield additive savings.

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

Total P4P incentives are summarized below:

Total Recommended Project Savings	**Incentives $**		
11.6%	Elec	Gas	Total
Incentive #1	$0	$0	$5,000
Incentive #2	$0	$0	$0
Incentive #3	$0	$0	$0
Total All Incentives	**$0**	**$0**	**$5,000**

The current ECM's does not meet the minimum savings of 15% and therefore the building will not be eligible for incentives #2 and #3. See Appendix D for additional details.

5.1.2 New Jersey Smart Start Program

For this program, specific incentives for energy conservation measures are calculated on an individual basis utilizing the 2011 New Jersey Smart Start incentive program. This program provides incentives dependent upon mechanical and electrical equipment. If applicable, incentives from this program are reflected in the ECM summaries and attached appendices.

If the complex qualifies and enters into the New Jersey Pay for Performance Program, all energy savings will be included in the total site energy reduction, and savings will be applied towards the Pay for Performance incentive. A project is not applicable for both New Jersey incentive programs.

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 or natural gas utility companies. On a case-by-case basis, the program manager may accept a project for a customer that is within 10% of the 150 kW peak demand threshold.

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, natural gas, 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 70% of each project cost up to $75,000 per electrical utility account; total funding for each year is capped at $250,000 per customer. 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.

The school is potentially eligible to receive incentives from the Direct Install Program for select ECMs.

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 facility was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The building's roof has sufficient room to install a large solar cell array. All rooftop areas have been replaced, and are in good condition. It is recommended to install a permanent PV array at this time.

The PVWATTS solar power generation model was utilized to calculate PV power generation. The closest city available in the model is Newark, New Jersey and a fixed tilt array type was utilized to calculate energy production. The PVWATT solar power generation model is provided in Appendix F.

Federal tax credits are also available for renewable energy projects up to 30% of installation cost. Since the facility is a non-profit organization, federal taxes are paid and this project is eligible for this incentive.

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 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 existing available roof area justifies the use of 100 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 $4.00per watt or $4,000 per kW of installed system, for a 100 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

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	* Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
400,000	**100**	**131,374**	**0**	**18,786**	**0**	**18,786**	**0**	**7,882**	**21.3**	**15.0**

This measure is not recommended due to the long payback time. It is suggested, however, that the market for SREC credits is closely monitored. This market is fluctuating, and if the value per SREC is increased the measure could potentially show for a shorter payback in the near future.

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 is not recommended since the facility currently uses natural gas, the building is not occupied year-round, and domestic hot water demand is not excessive.

6.2 Demand Response Curtailment

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

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

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From July 2011 through June 2012, the Penns Grove-Carneys Point Regional School District Elementary School had a maximum electricity demand of 124.80 kW and a minimum of 119.20 kW. The monthly average over the observed 12 month period was 120.20 kW.

This measure is not recommended because the facility is not operating year round, and the building does not have back up/emergency generator power.

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/ft^2/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100, with 100 being the most efficient. In order for a building to receive and Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed ECMs, 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). Site EUI is a measure of a building's annual energy utilization per square foot. Site EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types.

$$\textbf{\textit{Site Energy Intensity}} = \frac{(\textit{Electric Usage in kBtu + Natural Gas in kBtu})}{\textit{Building Square Footage}}$$

To provide an equitable comparison for different buildings with varying proportions of primary and secondary energy consumption, the Portfolio Manager uses the convention of Source EUIs. The source energy also accounts for all losses incurred in production, storage, transmission, and delivery of energy to the site; which provides an equivalent measure for various types of buildings with different energy sources.

$$\textbf{\textit{Source Energy Intensity}} = \frac{(\textit{Electric Usage in kBtu X Site/Source Ratio + Natural Gas in kBtu X Site/Source Ratio})}{\textit{Building Square Footage}}$$

The EPA Score, Site EUI, and Source EUI for the Paul W. Carleton Elementary School are as follows:

Energy Intensity	Paul W. Carleton Elementary School	National Average
EPA Score	53	50
Site (kBtu/sf/year)	47	49
Source (kBtu/sf/year)	89	92

The Paul W. Carleton Elementary School is considered a lower than average energy consumer by the EPA Portfolio Manager which gives it a higher than average EPA score. For the building to qualify for the Energy Star label the EPA score is required to be above 75. There are several energy conservation measures recommended in this report, that if implemented will further reduce the energy use intensity and increase the EPA score of the facility.

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/).

Username: [redacted]

Password: [redacted]

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

The login information for the building's EPA Portfolio Manager Account has been provided to Frederick Weiss.

8.0 CONCLUSIONS & RECOMMENDATIONS

The Energy Conservation Measures (ECMs) identified in this report will allow for a more efficient use of energy and if pursued have the opportunity to qualify for the New Jersey SmartStart Buildings Program and/or Direct Install Program. Potential annual savings of $17,000 for the recommended ECMs may be realized with a payback of 7.2 years. A summary of the costs, savings, and paybacks for the recommended ECMs follows:

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	Replace Steam to Hot Water Boiler-Heat Exchanger System with Condensing Hot Water Boiler	1,050,000	5,800	>20	1,800	>20	
2	Replace Domestic Water Heater	17,000	3,500	4.8	300	4.9	X
3	Replace Exterior Door Seals & Sweeps	5,000	500	10.0	0	10.0	X
4	Replace Rooftop Units w/ Higher EER Rooftop Units	33,000	200	>20	1,000	>20	
5	Replace Electric Dishwasher Booster Heater w/ Natural Gas	15,000	1,700	8.8	0	8.8	X
6	Lighting Replacements (Select Areas)	73,000	7,300	10.0	4,800	9.3	
7	Lighting Controls (Select Areas)	12,000	7,300	1.6	2,100	1.4	
8	Lighting Replacements & Controls (Select Areas)	85,000	11,300	7.5	6,900	6.9	X
9	Water Conservation (Low Flow Fixtures)	97,000	1,400	>20	0	>20	

APPENDIX A

Utility Usage Analysis, Energy Suppliers List

Penns Grove - Carneys Point Board of Education
100 Iona Ave, Penns Grove, NJ 08069

Utility Bills: Account Numbers

Account Number	School Building	Location	Type	Notes
0142 0559 9997	Paul W. Carleton Elementary School	Maple Ave School, Penns Grove, NJ 08069	Electric	
2 12 35 3037 0 4	Paul W Carleton School	251 Maple Ave, Penns Grove, NJ	Gas	
18-1586571-0	Paul W. Carleton Elementary School	E Maple Street, Penns Grove, NJ 08069	Water	

Penns Grove - Carneys Point Board of Education
100 Iona Ave, Penns Grove, NJ 08069

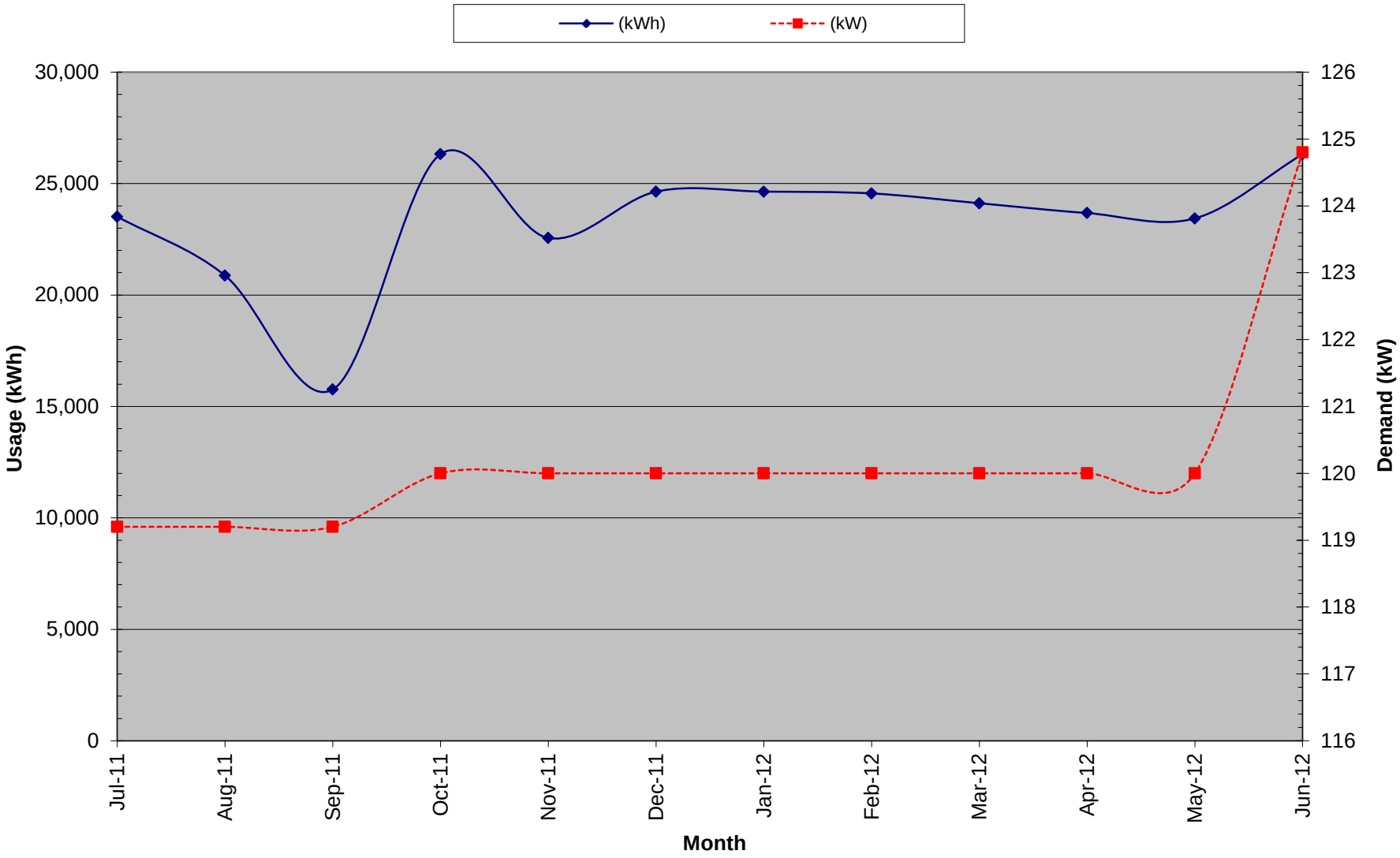
Electric Service
Delivery - ACE
Supplier - New Energy Inc / SJ Energy Co

For Service at: **Paul W. Carleton Elementary School**
Account No.: **0142 0559 9997**
Meter No.: **5856767**

			Charges			Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Total ($)	Delivery ($)	Supply ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
July-11	23,520	119.20	$1,450.89	$1,450.89		$ 0.062	$ 0.032	$ 5.93
August-11	20,880	119.20	$3,303.90	$1,405.70	$1,898.20	$ 0.158	$ 0.123	$ 6.13
September-11	15,760	119.20	$2,698.52	$1,265.78	$1,432.74	$ 0.080	$ 0.034	$ 6.13
October-11	26,320	120.00	$4,047.54	$1,492.06	$2,555.48	$ 0.154	$ 0.128	$ 5.73
November-11	22,560	120.00	$3,464.02	$1,413.09	$2,050.93	$ 0.154	$ 0.121	$ 6.13
December-11	24,640	120.00	$3,715.98	$1,475.96	$2,240.02	$ 0.151	$ 0.121	$ 6.13
January-12	24,640	120.00	$3,767.67	$1,527.65	$2,240.02	$ 0.153	$ 0.121	$ 6.52
February-12	24,560	120.00	$3,617.08	$1,384.33	$2,232.75	$ 0.147	$ 0.120	$ 5.53
March-12	24,120	120.00	$3,652.81	$1,427.33	$2,225.48	$ 0.151	$ 0.122	$ 5.93
April-12	23,680	120.00	$3,623.07	$1,470.32	$2,152.75	$ 0.153	$ 0.121	$ 6.33
May-12	23,440	120.00	$3,513.81	$1,382.88	$2,130.93	$ 0.150	$ 0.121	$ 5.73
June-12	26,320	124.80	$3,272.63	$1,511.82	$1,760.81	$ 0.124	$ 0.096	$ 5.93
Total (All)	**280,440**	**124.80**	**$40,127.92**	**$17,207.81**	**$22,920.11**	**$ 0.143**	**$ 0.107**	**$ 6.01**

Notes
Designates an Interpolated value (data missing)

Electric Usage - Paul W. Carleton Elementary School - 0142 0559 9997



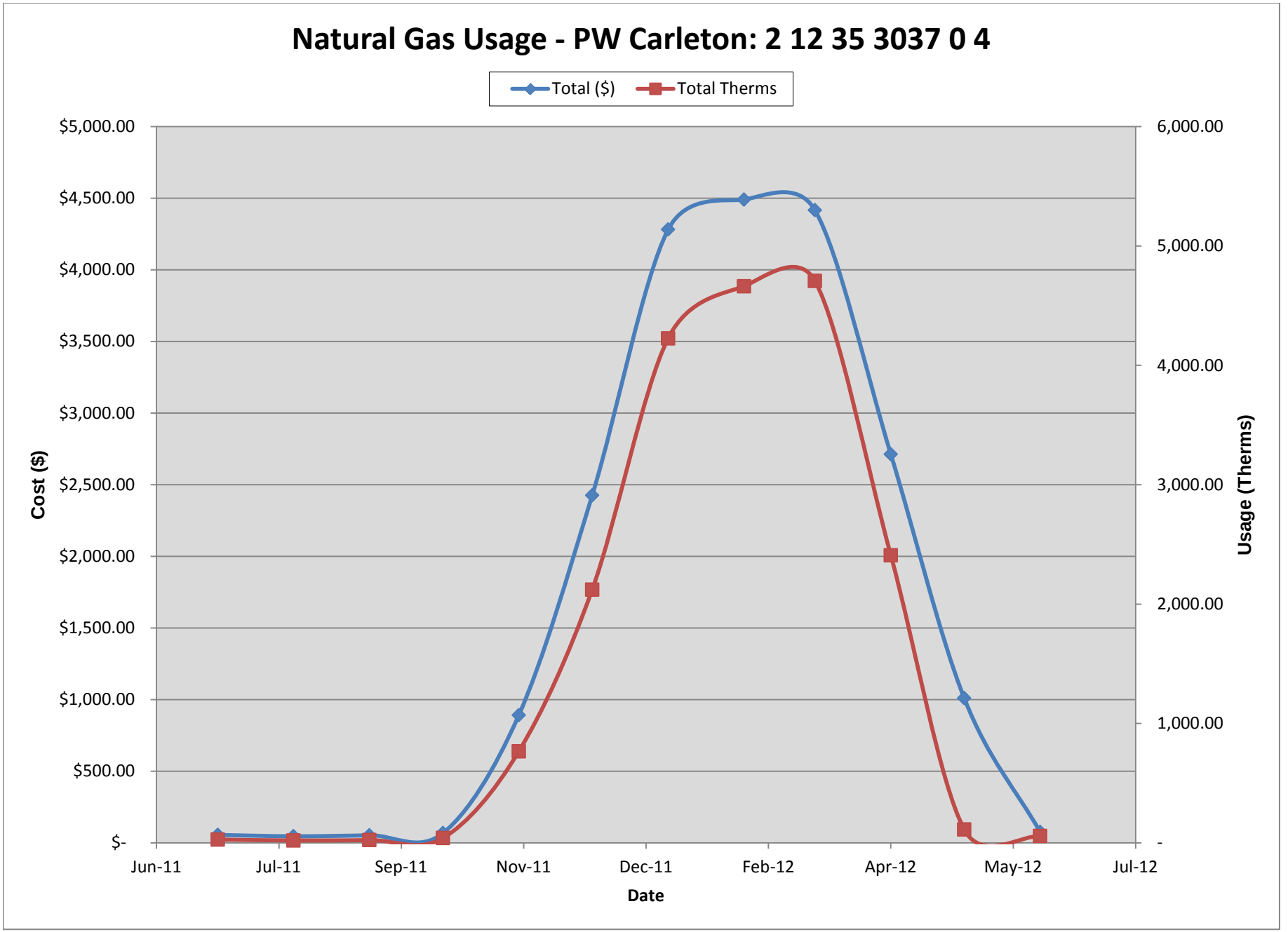
Paul W Carleton Utilities
PWC ES Electric Graph

Penns Grove - Carneys Point Board of Education
Maple Ave School, Penns Grove, NJ 08069

Gas Service
Delivery -
Supplier -

For Service at: **Paul W. Carleton Elementary School**
Account No.: **2 12 35 3037 0 4**
Meter No.: **0223790**
0468173

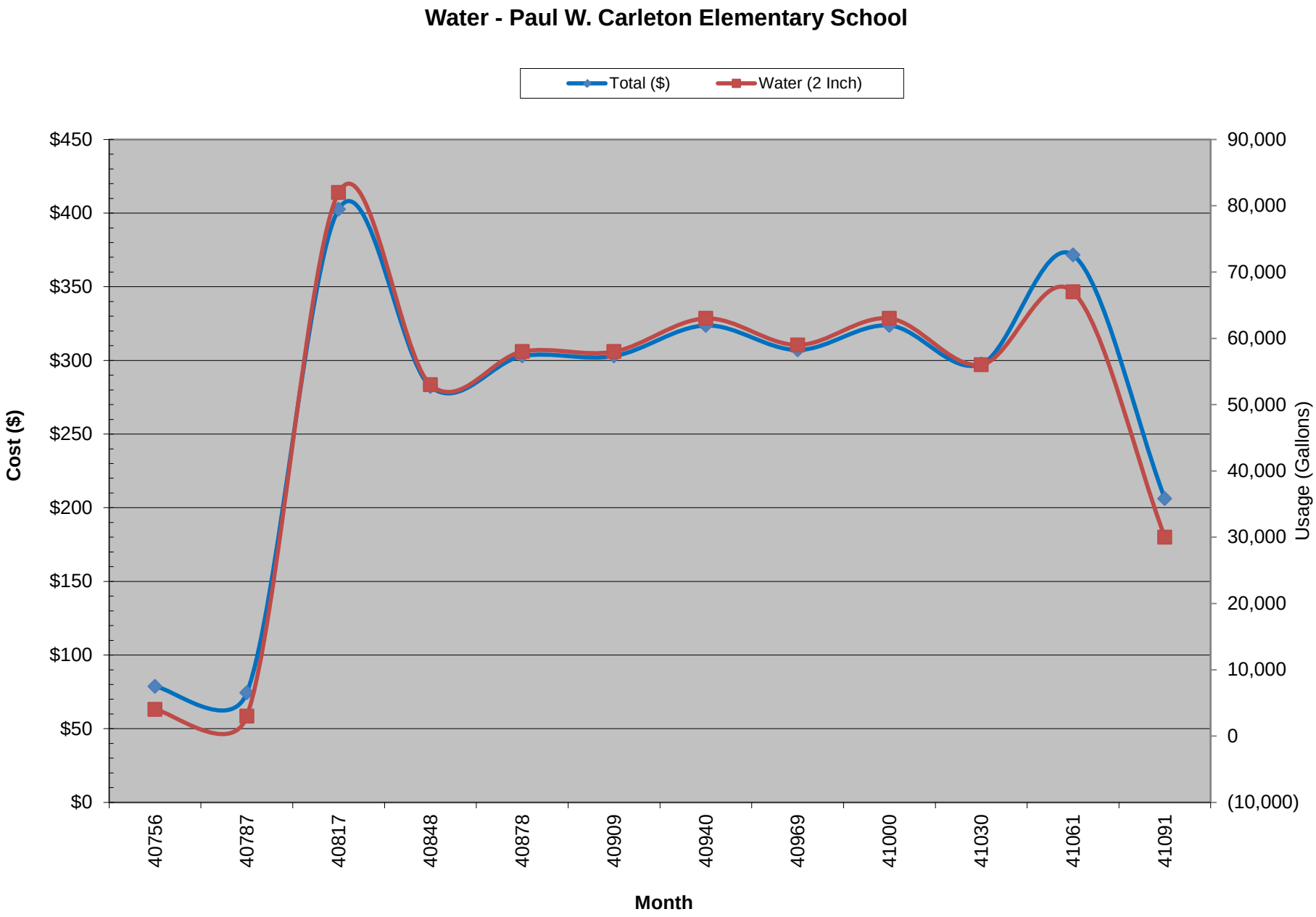
Month	Total ($)	Delivery ($)	Supply ($)	Total Therms	$/Therm
Jul-11	$ 54.75	$ 37.54	$ 17.21	26.99	$ 2.03
Aug-11	$ 45.58	$ 33.02	$ 12.56	19.70	$ 2.31
Sep-11	$ 52.44	$ 37.84	$ 14.60	22.90	$ 2.29
Oct-11	$ 67.11	$ 42.08	$ 25.03	39.25	$ 1.71
Nov-11	$ 890.65	$ 402.45	$ 488.20	765.58	$ 1.16
Dec-11	$ 2,425.72	$ 1,073.38	$ 1,352.34	2,120.68	$ 1.14
Jan-12	$ 4,280.96	$ 2,106.69	$ 2,174.27	4,226.07	$ 1.01
Feb-12	$ 4,490.66	$ 2,297.10	$ 2,193.56	4,662.58	$ 0.96
Mar-12	$ 4,416.74	$ 2,320.54	$ 2,096.20	4,707.38	$ 0.94
Apr-12	$ 2,713.03	$ 1,443.05	$ 1,269.98	2,409.15	$ 5.02
May-12	$ 1,009.32	$ 565.56	$ 443.76	110.92	$ 9.10
Jun-12	$ 75.96	$ 51.13	$ 24.83	56.00	$ 1.36
Total	**$ 20,522.92**	**$ 10,410.38**	**$ 10,112.54**	**19,167.20**	**$ 1.07**
				Monthly	annual
Notes			DHW	46	552
Designates an interpolated value (no data given)			HHW Heating		18,616


Natural Gas Usage - PW Carleton: 2 12 35 3037 0 4
Total ($)
Total Therms
$5,000.00
$4,500.00
$4,000.00
$3,500.00
$3,000.00
$2,500.00
$2,000.00
$1,500.00
$1,000.00
$500.00
$-
6,000.00
5,000.00
4,000.00
3,000.00
2,000.00
1,000.00
-
Cost ($)
Usage (Therms)
Jun-11
Jul-11
Sep-11
Nov-11
Dec-11
Feb-12
Apr-12
May-12
Jul-12
Date

Penns Grove - Carneys Point Board of Education
100 Iona Ave, Penns Grove, NJ 08069

For Service at: **Paul W. Carleton Elementary School**
Account No.: **='Account #s'!A19**
Meter No.: **60560866** 2 Inch

Month	Total ($)	Gallons (2 Inch)	$/kGal
Aug-11	$ 78.63	4,000	$ 19.66
Sep-11	$ 74.47	3,000	$ 24.82
Oct-11	$ 402.66	82,000	$ 4.91
Nov-11	$ 282.19	53,000	$ 5.32
Dec-11	$ 302.96	58,000	$ 5.22
Jan-12	$ 302.96	58,000	$ 5.22
Feb-12	$ 323.73	63,000	$ 5.14
Mar-12	$ 307.11	59,000	$ 5.21
Apr-12	$ 323.73	63,000	$ 5.14
May-12	$ 297.51	56,000	$ 5.31
Jun-12	$ 371.52	67,000	$ 5.55
Jul-12	$ 206.12	30,000	$ 6.87
Total	**$ 2,717.83**	**596,000**	**$ 8.20**


Water - Paul W. Carleton Elementary School
Total ($)
Water (2 Inch)
Cost ($)
Usage (Gallons)
Month
$450
$400
$350
$300
$250
$200
$150
$100
$50
$0
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
(10,000)
40756
40787
40817
40848
40878
40909
40940
40969
41000
41030
41061
41091

ATLANTIC CITY ELECTRIC SERVICE TERRITORY
Last Updated: 09/11/12
***CUSTOMER CLASS - R – RESIDENTIAL C – COMMERCIAL I – INDUSTRIAL**

Supplier	Telephone	*Customer
Alpha Gas and Electric, LLC 641 5th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	**R/C** **ACTIVE**
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877) 30-AMBIT (877) 302-6248 www.ambitenergy.com	**R/C** **ACTIVE**
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com	**C** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(201) 384-5552	**R/C/I** **ACTIVE**
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	**C/I ACTIVE**
Champion Energy Services, LLC 72 Avenue L Newark, NJ 07105	(877) 653-5090 www.championenergyservices.com	**R/C/I** **ACTIVE**
Clearview Electric, Inc. 505 Park Drive Woodbury, NJ 08096	(888) CLR-VIEW (800) 746- 4702 www.clearviewenergy.com	**R/C/I** **ACTIVE**
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180 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	(888) 925-9115 www.directenergybusiness.com	**C/I** **ACTIVE**
Direct Energy Services, LLC 120 Wood Avenue	(866) 547-2722 www.directenergy.com	**C/I** **ACTIVE**
Discount Energy Group, LLC 811 Church Road, Suite 149	(800) 282-3331 www.discountenergygroup.com	**R/C** **ACTIVE**
DTE Energy Supply, Inc. One Gateway Center, Suite 2600	877-332-2450 www.dtesupply.com	**C/I** **ACTIVE**
Energy Plus Holdings LLC 309 Fellowship Road	(877) 866-9193 www.energypluscompany.com	**R/C** **ACTIVE**
Ethical Electric Benefit Co. d/b/a Ethical Electric	(888) 444-9452 www.ethicalelectric.com	**R/C ACTIVE**
FirstEnergy Solutions Corp. 300 Madison Avenue	(800) 977-0500 www.fes.com	**C/I** **ACTIVE**
Gateway Energy Services Corporation	(800) 805-8586 www.gesc.com	**R/C/I** **ACTIVE**
GDF SUEZ Energy Resources NA, Inc.	(866) 999-8374 www.gdfsuezenergyresources.com	**C/I** **ACTIVE**
Glacial Energy of New Jersey, Inc.	(888) 452-2425	**C/I**
Lafayette, NJ 07848	www.glacialenergy.com	**ACTIVE**

Hess Corporation 1 Hess Plaza	(800) 437-7872 www.hess.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road	(888) 264-4908 www.hikoenergy.com	**R/C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street	(973) 438-4380 www.idtenergy.com	**R/C** **ACTIVE**
Independence Energy Group, LLC	(877) 235-6708 www.chooseindependence.com	**R/C ACTIVE**
Integrys Energy Services, Inc. 99 Wood Avenue, South	(877) 769-9977 www.integrysenergy.com	**C/I** **ACTIVE**
Liberty Power Delaware, LLC 3000 Atrium Way, Suite 273	(866) 769-3799 www.libertypowercorp.com	**R/C/I** **ACTIVE**
Liberty Power Holdings, LLC 3000 Atrium Way, Suite 273	(866) 769-3799 www.libertypowercorp.com	**R/C/I** **ACTIVE**
Linde Energy Services 575 Mountain Avenue	(800) 247-2644 www.linde.com	**C/I** **ACTIVE**
NATGASCO, Inc. 532 Freeman St.	(973) 678-1800 x. 251 www.supremeenergyinc.com	**R/C** **ACTIVE**
NextEra Energy Services New Jersey, LLC	(877) 528-2890 Commercial (800) 882-1276 Residential	**R/C/I** **ACTIVE**
NJ Gas & Electric 1 Bridge Plaza fl. 2	866-568-0290 www.NJGandE.com	**R/C/I** **ACTIVE**
Noble Americas Energy Solutions The Mac-Cali Building	(877) 273-6772 www.noblesolutions.com	**C/I** **ACTIVE**
North American Power and Gas, LLC 222 Ridgedale Ave.	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
Palmco Power NJ, LLC One Greentree Centre	(877) 726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Pepco Energy Services, Inc. 112 Main St.	(800) ENERGY-9 (363-7499) www.pepco-services.com	**C/I** **ACTIVE**
PPL EnergyPlus, LLC 811 Church Road	(800) 281-2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Public Power & Utility of New Jersey, LLC	(888) 354-4415 www.ppandu.com	**R/C/I** **ACTIVE**
Reliant Energy	(877) 297-3795 (877) 297-3780 www.reliant.com/pjm	**R C/I ACTIVE**
ResCom Energy LLC 18C Wave Crest Ave.	(888) 238-4041 http://rescomenergy.com	**R/C/I** **ACTIVE**
Respond Power LLC 10 Regency CT	(877) 973-7763 www.respondpower.com	**R/C/I** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54	(800) 266-6020 www.southjerseyenergy.com	**C/I** **ACTIVE**
Sperian Energy Corp. 1200 Route 22 East, Suite 2000	(888) 682-8082	**R/C/I** **ACTIVE**
Starion Energy PA Inc. 101 Warburton Avenue	(800) 600-3040 www.starionenergy.com	**R/C/I** **ACTIVE**
Stream Energy 309 Fellowship Road, Suite 200	(877) 369-8150 www.streamenergy.net	**R** **ACTIVE**
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive	(856) 273-9995 www.ugienergyservices.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 50 East Palisades Avenue	(800) 388-3862 www.lowcostpower.com	**R/C/I** **ACTIVE**
Viridian Energy 2001 Route 46, Waterview Plaza	(866) 663-2508 www.viridian.com	**R/C/I** **ACTIVE**
Xoom Energy New Jersey, LLC 744 Broad Street	888-997-8979 www.xoomenergy.com	**R/C/I** **ACTIVE**
YEP Energy 89 Headquarters Plaza North	855-363-7736 www.yepenergyNJ.com	**R/C/I** **ACTIVE**
Your Energy Holdings, LLC One International	(855) 732-2493 www.thisisyourenergy.com	**R/C/I ACTIVE**

Back to main supplier information page

SOUTH JERSEY GAS SERVICE TERRITORY

Last Updated: 09/11/12

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

Supplier	Telephone	Customer
Alpha Gas and Electric, LLC 641 5th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	**R/C ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	201- 384-5552 www.astralenergyllc.com	**R/C/I ACTIVE**
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	**C/I ACTIVE**
Clearview Electric Inc. d/b/a Clearview Gas 1744 Lexington Ave. Pennsauken, NJ 08110	800-746-4720 www.clearviewenergy.com	**R/C ACTIVE**
Colonial Energy, Inc. 83 Harding Road Wyckoff, NJ 07481	845-429-3229 www.colonialgroupinc.com	**C/I ACTIVE**
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**
Consolidated Edison Solutions, Inc. Cherry Tree Corporate Center 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-665-0955 www.conedsolutions.com	**C/I ACTIVE**
Constellation NewEnergy-Gas Division, LLC 900A Lake Street, Suite 2 Ramsey, NJ 07466	(800) 900-1982 www.constellation.com	**C/I ACTIVE**
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 www.directenergy.com	**C/I ACTIVE**
Direct Energy Services, LLP 120 Wood Avenue, Suite 611 Iselin, NJ 08830	866-547-2722 www.directenergy.com	**R/C/I INACTIVE**
Energy Plus Natural Gas LP 309 Fellowship Road, East Gate Center, Suite 200 Mt. Laurel, NJ 08054	(877) 866-9193 www.energypluscompany.com	**R/C ACTIVE**
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	800-805-8586 www.gesc.com	**R/C/I ACTIVE**
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergyservices.com	**C/I ACTIVE**
Glacial Energy of New Jersey, Inc. 75 Route 15 Building E Lafayette, NJ 07848	888-452-2425 www.glacialenergy.com	**C/I ACTIVE**
Global Energy Marketing, LLC 129 Wentz Avenue Springfield, NJ 07081	800-542-0778 www.globalp.com	**C/I ACTIVE**

Great Eastern Energy 116 Village Blvd., Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	**C/I ACTIVE**
Greenlight Energy 330 Hudson Street, Suite 4 Hoboken, NJ 07030	718-204-7467 www.greenlightenergy.us	**C ACTIVE**
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	**C/I ACTIVE**
Hess Small Business Services, LLC One Hess Plaza Woodbridge, NJ 07095	888-494-4377 www.hessenergy.com	**C/I ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	**R/C ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	973-438-4380 www.idtenergy.com	**R/C ACTIVE**
Integrys Energy Services – Natural Gas, LLC 99 Wood Avenue South Suite #802 Iselin, NJ 08830	(800) 536-0151 www.integrysenergy.com	**C/I ACTIVE**
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	800-927-9794 www.intelligentenergy.org	**R/C/I ACTIVE**
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	800-828-9427 www.metromediaenergy.com	**C ACTIVE**
MxEnergy, Inc. 900 Lake Street Ramsey, NJ 07446	800-758-4374 www.mxenergy.com	**R/C/I ACTIVE**
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	800-840-4GAS www.natgasco.com	**C ACTIVE**
New Jersey Gas & Electric 1 Bridge Plaza, Fl. 2 Fort Lee, NJ 07024	866-568-0290 www.NJGandE.com	**R/C ACTIVE**
North American Power & Gas, LLC **d/b/a North American Power** 197 Route 18 South Ste. 3000 East Brunswick, NJ 08816	(888) 313-9086 www.napower.com	**C/I ACTIVE**
Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	**R/C/I ACTIVE**
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	800-363-7499 www.pepco-services.com	**C/I ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	**R/C/I ACTIVE**
PPL EnergyPlus, LLC 811 Church Road - Office 105 Cherry Hill, NJ 08002	800-281-2000 www.pplenergyplus.com	**C/I ACTIVE**

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

Back to main supplier information page

APPENDIX B

Equipment Inventory

New Jersey BPU Energy Audit Program
CHA #24510
Penns Grove School District
Paul W. Carleton Elementary School
Original Construction Date: 1951
Renovation/Addtion Date: 1982, 2001

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size/ Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
RTU-1	1	Trane	TCD060C300BD	R42100812D	HVAC Cooling /Electric	5 Ton /10 SEER	Roof	N/A	2000	8	New
RTU-2	1	Trane	TCD075C300BC	R43101218D	HVAC Cooling /Electric	6.5 Ton 9 EER	Roof	N/A	2000	8	Good
RTU-3	1	Trane	TCC030F100BE	R4121W31H	HVAC Cooling /Electric	2.5 Ton 9.10 EER	Roof	N/A	2000	8	Good
RTU-4	1	Trane Voyager	N/A	N/A	HVAC Cooling /Electric	12 ton 9.2 EER	Roof	Gymnasium	2000	8	Good
Air Compressor	1	Baldor	127466P086	35B01-12676	HVAC Pneumatic Controls /Electric	78.5% Efficiency	Boiler Room	Pneumatic Control System	2000	8	Fair
Air Dryer	1	Hankison International	8005	0331-101-9411-1966N	HVAC Pneumatic Controls /Electric	5 scfm @ 100 psig	Boiler Room	Pneumatic Control System	2000	8	Fair
Boiler-1	1	HB Smith	M450L	N/A	HVAC Heating /Natural Gas	6968 MBH Max 2903 MBH Min	Boiler Room	Steam	1995	8	Fair
Booster Heater	1	Hatco	C-45	8295791050	Dishwasher Hot Water /Electric	45kW	Kitchen	Kitchen	N/A	N/A	NG Piping available, 180F
Compressed Air Tank	1	Quincy	QC00503S	504-233	HVAC Pneumatic Controls /Electric	N/A	Boiler Room	Pneumatic Control System	N/A	N/A	Fair
Condensate HX	1	S.A. Armstrong	WB-B4-4-1	422843	HVAC Hot water System /Electric	N/A	Boiler Room	Hot Water Heating System	2000	8	Good
CU	1	Trane	N/A	N/A	HVAC Condensing Unit /Electric	N/A	Outside	N/A	2000	8	Fair
DDC	1	Johnson Controls	A99BC-300C	N/A	HVAC Controls /Electric	N/A	Boiler Room	Boiler-1	N/A	N/A	Good
DHW Heater	1	Bradford White	M150S6DS13	WL2669755	Domestic Hot Water System /Electric	50 Gallons /4.5 kW	Gym Storage Rm	Lavatories /Locker Rooms	1997	0	NG Piping available
DHW Heater	1	Bradford White	MII120A-18-3SF-037	YE-01-1632	Domestic Hot Water System /Electric	120 Gallons /18 kW	Kitchen	Kitchen	2001	4	Good
Exhaust Blower	1	Dayton	3N042M	R613011M F301B	Boiler Exhaust /Electric	3/4 HP /78.5% Efficiency	Boiler Room	Boiler-1	N/A	N/A	Fair
Fan Motor	1	Marathon	7V846A17165L P	K70810106010	Fan /Electric	1/8 HP	N/A	N/A	N/A	N/A	Good
Freezer	1	HeatCraft	ADT090AJ	D96F 08382	Walk-In Freezer /Electric	2/15 HP	Kitchen	Kitchen	1983	-11	Fair
HW Pump	2	A.O. Smith	P48K2EB7	1J96 1C92	HVAC Hot water System	1/2 HP	Boiler Room	Hot Water Heating System	1996	2	Good
NG Burner	1	Baldor	M3158T-8	35B01-2670	HVAC Heating /Natural Gas	3 HP /82.5% Efficiency	Boiler Room	Hot Water Heating System	1996	8	Fair
Oil Buner	1	Preferred Utilities	BHE 40 3M4	29518	HVAC Heating /Natural Gas	40 GPH Max	Boiler Room	Hot Water Heating System	1996	8	Fair
Sump Pump	1	TEEL	3P546F	399	Sewer System /Electric	N/A	Boiler Room	Sewer System	N/A	N/A	Fair
Time Switch	1	Paragon	703-10	N/A	HVAC Controls /Electric	1 kW	Boiler Room	HVAC System	N/A	N/A	Disconnected
UH	1	Dunham	V225	107193	HVAC Unitary Heater /Natural Gas	N/A	Kitchen	Kitchen	1955	N/A	Gfair
UH	1	Trane	UHSA100A8EAA1T000A000	C00M68089	HVAC Unitary Heater /Steam	1/8HP /96 MBH Output Steam /73 MBH Output HW	Storage	Storage	2000	N/A	Good

Energy Audit of Penns Grove School District

CHA Project No.24510

Existing Lighting

Cost of Electricity: **$0.143** **$/kWh**

$6.01 **$/kW**

			EXISTING CONDITIONS									
	Area Description	**Usage**	**No. of Fixtures**	**Standard Fixture Code**	**NYSERDA Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Retrofit Control**	**Annual kWh**	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	"Lighting Fixture Code" 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	Retrofit control device	(kW/space) * (Annual Hours)	Notes
191	Boiler Room	Mechanical Room	2	S 60 C F 2 (ELE) 8'	F82EE	123	0.25	SW	1000	C-OCC	246	
21	Boiler Room	Mechanical Room	1	1B 34 C F 4 (MAG)	F44EE	144	0.14	SW	1000	C-OCC	144	
18	Boiler Room	Mechanical Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1000	C-OCC	224	
71	Boiler Room	Mechanical Room	1	I 60	I60/1	60	0.06	SW	1000	C-OCC	60	
47	Boys Bathroom	Bath Room	3	1B 34 C F 2 (MAG)	F42EE	72	0.22	SW	2000	NONE	432	
16	213	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	214	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	211	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	Hallway (2nd Floor)	Hallways	24	T 34 R F 2 (MAG)	F42EE	72	1.73	SW	2280	NONE	3,940	
16	212	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	209	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	210	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	207	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	208	Classroom	10	T 34 R F 2 (MAG)	F42EE	72	0.72	SW	2912	C-OCC	2,097	
71	Janitor Closet	Linen/Utility/Wet/Janitor/Electrical	1	I 60	I60/1	60	0.06	SW	1000	C-OCC	60	
47	Girls Bathroom	Bath Room	3	1B 34 C F 2 (MAG)	F42EE	72	0.22	SW	2000	NONE	432	
16	Faculty Room	Staff Lounge	4	T 34 R F 2 (MAG)	F42EE	72	0.29	SW	5000	C-OCC	1,440	
71	Faculty Room	Staff Lounge	1	I 60	I60/1	60	0.06	SW	5000	C-OCC	300	
47	Faculty Room Bath Room	Bath Room	1	1B 34 C F 2 (MAG)	F42EE	72	0.07	SW	2000	NONE	144	
172-A	Faculty Room	Staff Lounge	3	W 20 W F 2 (MAG)	F22SS	56	0.17	SW	5000	C-OCC	840	
35	Men/Womens Bathroom (2nd Floor)	Bath Room	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2000	NONE	180	
16	Stairway Room	Classroom	4	T 34 R F 2 (MAG)	F42EE	72	0.29	SW	2912	NONE	839	
35	Handicapped Bathroom	Bath Room	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2000	NONE	180	
16	205	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	206	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	203	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	204	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	201	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	202	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
13	Stairway	Stairway	4	S 32 P F 2 (ELE)	F42LL	60	0.24	SW	3200	NONE	768	
174	Entryway	Hallways	3	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOWN	F43EE	115	0.35	SW	2280	NONE	787	
141	Gym	Gymnasium	20	HPS 250	HPS250/1	295	5.90	SW	2912	NONE	17,181	
174	Gym Office	Office	1	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOWN	F43EE	115	0.12	SW	3000	C-OCC	345	
16	Gym Storage	Storage Areas	4	T 34 R F 2 (MAG)	F42EE	72	0.29	SW	1000	C-OCC	288	
174	Gym Boys Bathroom	Bath Room	2	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOWN	F43EE	115	0.23	SW	2000	NONE	460	
174	Gym Girls Bathroom	Bath Room	2	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOWN	F43EE	115	0.23	SW	2000	NONE	460	
16	100	Classroom	4	T 34 R F 2 (MAG)	F42EE	72	0.29	SW	2912	C-OCC	839	
16	Nurse	Office	2	T 34 R F 2 (MAG)	F42EE	72	0.14	SW	3000	C-OCC	432	
71	Nurse	Office	2	I 60	I60/1	60	0.12	SW	3000	C-OCC	360	
16	101	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	104	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	104	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
35	Conference Room	Conference	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	1200	C-OCC	324	
16	Cafeteria	Cafeteria	38	T 34 R F 2 (MAG)	F42EE	72	2.74	SW	1600	NONE	4,378	
16	Kitchen	Cafeteria	8	T 34 R F 2 (MAG)	F42EE	72	0.58	SW	1600	NONE	922	
71	Kitchen Freezer	Cooler/Freezer	1	I 60	I60/1	60	0.06	SW	8760	C-OCC	526	
71	Back Kitchen Entryway	Hallways	7	I 60	I60/1	60	0.42	SW	2280	NONE	958	
16	Handicapped Bathroom	Bath Room	1	T 34 R F 2 (MAG)	F42EE	72	0.07	SW	2000	NONE	144	
16	Womens Bathroom	Bath Room	1	T 34 R F 2 (MAG)	F42EE	72	0.07	SW	2000	NONE	144	
71	Girls Bathroom	Bath Room	6	I 60	I60/1	60	0.36	SW	2000	NONE	720	
71	Janitor Closet	ical	1	I 60	I60/1	60	0.06	SW	1000	C-OCC	60	
71	Stairway	Stairway	6	I 60	I60/1	60	0.36	SW	3200	NONE	1,152	

Energy Audit of Penns Grove School District

CHA Project No.24510

Existing Lighting

Cost of Electricity: **$0.143** **$/kWh**

$6.01 **$/kW**

			EXISTING CONDITIONS									
	Area Description	**Usage**	**No. of Fixtures**	**Standard Fixture Code**	**NYSERDA Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Retrofit Control**	**Annual kWh**	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	"Lighting Fixture Code" 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	Retrofit control device	(kW/space) * (Annual Hours)	Notes
16	108	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	107	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	110	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	109	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	112	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
16	111	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
35	114	Classroom	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	2912	C-OCC	1,572	
16	113	Classroom	12	T 34 R F 2 (MAG)	F42EE	72	0.86	SW	2912	C-OCC	2,516	
18	Boys Bathroom	Bath Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	2000	NONE	448	
18	Library	Classroom	27	T 32 R F 4 (ELE)	F44ILL	112	3.02	SW	2912	C-OCC	8,806	
18	Library Office	Office	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	3000	C-OCC	1,344	
16	318	Classroom	6	T 34 R F 2 (MAG)	F42EE	72	0.43	SW	2912	C-OCC	1,258	
35	309	Classroom	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	2912	C-OCC	786	
35	311 - Computer Lab	Classroom	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.35	SW	2912	C-OCC	3,931	
16	308	Classroom	1	T 34 R F 2 (MAG)	F42EE	72	0.07	SW	2912	C-OCC	210	
35	317	Classroom	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.35	SW	2912	C-OCC	3,931	
35	312	Classroom	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	2912	C-OCC	1,572	
35	Office PC Room	Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	3000	C-OCC	270	
16	Outdoor Storage Room	Storage Areas	4	T 34 R F 2 (MAG)	F42EE	72	0.29	SW	1000	C-OCC	288	
35	317 Storage	Storage Areas	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	1000	C-OCC	270	
16	315 Storage	Storage Areas	4	T 34 R F 2 (MAG)	F42EE	72	0.29	SW	1000	C-OCC	288	
18	Main Office	Office	11	T 32 R F 4 (ELE)	F44ILL	112	1.23	SW	3000	C-OCC	3,696	
16	Server Room	Storage Areas	1	T 34 R F 2 (MAG)	F42EE	72	0.07	SW	1000	C-OCC	72	
71	Main Office Bathroom	Bath Room	3	I 60	I60/1	60	0.18	SW	2000	NONE	360	
141LED	Exterior	Outdoor Lighting	29	HPS 200	HPS200/1	250	7.25	SW	4368	C-OCC	31,668	
236	Exterior	Outdoor Lighting	8	R 75 C Q 1	h75/1	75	0.60	SW	4368	C-OCC	2,621	
146	Exterior	Outdoor Lighting	1	High Bay MH 400	MH400/1	458	0.46	SW	4368	C-OCC	2,001	
143	Exterior	Outdoor Lighting	10	HPS 100 POLE	HPS100/1	138	1.38	SW	4368	C-OCC	6,028	

Energy Audit of Penns Grove School District

CHA Project No.24510

Existing Lighting

Cost of Electricity:	**$0.143** $/kWh
	$6.01 $/kW

			EXISTING CONDITIONS									
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Retrofit Control	Annual kWh	
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	"Lighting Fixture Code" 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	Retrofit control device	(kW/space) * (Annual Hours)	Notes
	Total		**614**				**57.79**				**172,090**	

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	Replace Steam to Hot Water Boiler-Heat Exchanger System with Condensing Hot Water Boiler	1,050,000	5,800	>20	1,800	>20	
ECM-2	Replace Domestic Hot Water Heater	17,000	3,500	4.9	300	4.8	X
ECM-3	Replace Exterior Door Seals & Sweeps	5,000	500	10.0	0	10.0	
ECM-4	Replace Rooftop Units w/ Higher EER Rooftop Units	33,000	200	>20	1,000	>20	
ECM-5	Replace Electric Booster Heater w/ Natural Gas	15,000	1,700	8.8	0	8.8	X
ECM-6	Lighting Replacement/Upgrades (Select Areas)	73,000	7,300	10.0	4,800	9.3	X
ECM-7	Lighting Controls (Select Areas)	12,000	7,300	1.6	2,100	1.4	X
ECM-8	Lighting Replacement/Upgrades & Controls (Select Areas)	85,000	11,300	7.5	6,900	6.9	X
ECM-9	Water Conservation (Low Flow Fixtures)	97,000	1,400	>20	0	>20	

Penns Grove-Carneys Point Regional School District - NJBPU
CHA Project # 24510
Paul W. Carleton Elementary School

ECM Summary Sheet

ECM-1 Replace Steam to Hot Water Boiler-Heat Exchanger System with Condensing Hot Water Boiler

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
1,050,000	0	0	5,500	5,800	0	5,800	(0.8)	1,800	>20	>20

ECM-2 Replace Domestic Hot Water Heater

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
17,000	23,400	0	-600	3,500	0	3,500	1.5	300	4.9	4.8

ECM-3 Replace Exterior Door Seals & Sweeps

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
5,000	0	0	500	500	0	500	(0.5)	0	10.0	10.0

ECM-4 Replace Rooftop Units w/ Higher EER Rooftop Units

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
33,000	1,400	0	0	200	0	200	(0.9)	1,000	>20	>20

ECM-5 Replace Electric Booster Heater w/ Natural Gas

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
15,000	22,700	50	-1,000	1,700	0	1,700	2.6	0	8.8	8.8

ECM-6 Lighting Replacement/Upgrades (Select Areas)

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
73,000	56,800	0	0	7,300	0	7,300	0.5	4,800	10.0	9.3

ECM-7 Lighting Controls (Select Areas)

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
12,000	51,000	0	0	7,300	0	7,300	8.2	2,100	1.6	1.4

ECM-8 Lighting Replacement/Upgrades & Controls (Select Areas)

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
85,000	93,900	0	0	11,300	0	11,300	1.0	6,900	7.5	6.9

ECM-9 Water Conservation (Low Flow Fixtures)

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
97,000	0	0	0	1,400	0	1,400	(0.7)	0	>20	>20

Penns Grove-Carneys Point Regional School District - NJBPU
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Utility Costs		Yearly Usage	MTCDE	Building Area	Annual Utility Cost	
$ 0.143	$/kWh blended		0.00042021	55,515	Electric	Natural Gas
$ 0.107	$/kWh supply	280,440	0.00042021		40127.92	20522.92
$ 6.01	$/kW	125	0			
$ 1.07	$/Therm	19,167	0.00533471			
$ 8.20	$/kgals	596	0			

Paul W. Carleton Elementary School

	Item	Savings						Cost	Simple Payback	MTCDE	Life Expectancy	NJ Smart Start Incentives	Direct Install Eligible (Y/N)*	Direct Install Incentives**	Max Incentives	Payback w/ Incentives***	Simple Projected Lifetime Savings						ROI
		kW	kWh	therms	cooling kWh	kgal/yr	$										kW	kWh	therms	cooling	kgal/yr	$	
ECM-1	Replace Steam to Hot Water Boiler-Heat Exchanger System with Condensing Hot Water Boiler	0.0	0	5,463	0	0	$ 5,800	$ 1,050,092	181.1	29.1	35	$ 1,750	Y	$ 75,000	$ 1,750	180.7	0.0	0	191,215	0	0	$ 204,740	(0.8)
ECM-2	Replace Domestic Hot Water Heater	22.5	23,440	(589)	0	0	$ 3,500	$ 16,764	4.8	6.7	12	$ 300	Y	$ 11,700	$ 300	4.7	270.0	281,275	(7,072)	0	0	$ 42,019	1.5
ECM-3	Replace Exterior Door Seals & Sweeps	0.0	0	471	0	0	$ 500	$ 5,352	10.7	2.5	5		Y	$ 3,700	$ -	10.7	0.0	0	2,357	0	0	$ 2,524	(0.5)
ECM-4	Replace Rooftop Units w/ Higher EER Rooftop Units	0.0	1,404	0	0	0	$ 200	$ 33,300	166.5	0.6	15.0	$ 1,040	Y	$ 23,300	$ 1,040	161.3	0.0	21,059	0	0	0	$ 3,013	(0.9)
ECM-5	Replace Electric Booster Heater w/ Natural Gas	45.0	22,680	(968)	0	0	$ 1,700	$ 15,400	9.1	4.4	12.0		Y	$ 10,800	$ -	9.1	540.0	272,160	(11,611)	0	0	$ 55,663	2.6
ECM-6	Lighting Replacement/Upgrades (Select Areas)	17.6	56,755		0	0	$ 7,300	$ 73,373	10.1	23.8	15.0	$ 4,810	Y	$ 51,400	$ 4,810	9.4	263.8	851,327	0	0	0	$ 110,175	0.5
ECM-7	Lighting Controls (Select Areas)	0.0	51,031	0	0	0	$ 7,300	$ 11,948	1.6	21.4	15.0	$ 2,065	Y	$ 8,400	$ 2,065	1.4	0.0	765,459	0	0	0	$ 109,529	8.2
ECM-8	Lighting Replacement/Upgrades & Controls (Select Areas)	17.6	93,932	0	0	0	$ 11,300	$ 85,321	7.6	39.5	15.0	$ 6,875	Y	$ 59,700	$ 6,875	6.9	263.8	1,408,986	0	0	0	$ 169,877	1.0
ECM-9	Water Conservation (Low Flow Fixtures)	0.0	0	0	0	167	$ 1,400	$ 97,000	69.3	0.0	20.0		Y	$ 67,900	$ -	69.3	0.0	0	0	0	3,339	$ 27,376	(0.7)
	Total (Does Not Include ECM-6 & ECM-7)	**85.1**	**141,455.9**	**4,377.7**	**0.0**	**167.0**	**$ 11,700**	**$ 1,120,908**	**372.1**	**43.3**	**79.0**	**3,090.0**	**0.0**	**124,500.0**	**3,090.0**	**366.5**	**810.0**	**574,493.7**	**174,889.0**	**0.0**	**0.0**	**307,959.0**	**1.9**
	Total Measures with Payback <10	**85.1**	**140,051.9**	**(1,557)**	**0.0**	**0.0**	**$ 16,500**	**$ 117,485**	**21.4**	**50.5**	**39.0**	**7,175.0**	**0.0**	**82,200.0**	**7,175.0**	**20.7**	**1,073.8**	**1,962,420.2**	**(18,683.3)**	**0.0**	**0.0**	**267,558.6**	**5.1**
	% of Existing	**68%**	**50%**	**23%**	**0%**	**28%**																	

Penns Grove NJBPU
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Paul W. Carleton Elementary School

ECM-1: Replace Steam with Hot Water Boiler

Existing Fuel Na

Proposed Fuel Na

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 1.07	/ Therm	
Proposed Fuel Cost	$ 1.07	/ Therm	
Baseline Fuel Use	18,616	Therms	Based on historical utility data
Existing Boiler Plant Efficiency	65%		Estimated system efficiency
Baseline Boiler Load	1,210,019	Mbtu/yr	Baseline Fuel Use x Existing Efficiency x 100 M
Baseline Fuel Cost	$ 19,932		
Proposed Boiler Plant Efficiency	92%		New Boiler Efficiency
Proposed Fuel Use	13,152	Therms	Baseline Boiler Load / Proposed Efficiency / 10
Proposed Fuel Cost	$ 14,083		

*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**	**5,463**	**$0**	**$5,850**

Multipliers	
Material:	0.98
Labor:	1.22
Equipment:	1.09

ECM-1 Boiler Replacement

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
2,000 MBH NG Condensing Boiler	2	EA	$ 45,000	$ 25,000			$ 61,200	$ -	$ 90,000	
Flue Installation	2	EA	$ 5,000.0	$ 5,000.00		$ 9,760	$ 12,240	$ -	$ 22,000	
Pumps and accessories	2	EA	$ 2,500.0	$ 1,500.00		$ 4,880	$ 3,672	$ -	$ 8,552	
Hydronic Specialties	1	LS	$ 5,000.0	$ 5,000.00		$ 4,880	$ 6,120	$ -	$ 11,000	
Boiler Controls	1	LS	$ 1,000.0	$ 1,500.00		$ 976	$ 1,836	$ -	$ 2,812	
Miscellaneous Electrical	1	LS	$ 5,000	$ 30,000		$ 4,880	$ 36,720	$ -	$ 41,600	
HW Piping	1	LS	$ 150,000	$ 150,000		$ 146,400	$ 183,600	$ -	$ 330,000	
New Unit ventilators	30	EA	$ 5,000	$ 2,500		$ 146,400	$ 91,800	$ -	$ 238,200	
Controls	30	EA	$ 500	$ 1,000		$ 14,640	$ 36,720	$ -	$ 51,360	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

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

$ 795,524	Subtotal
$ 79,552	10% Contingency
$ 175,015	20% Contractor O&P
$ -	
$ 1,050,092	**Total**

Paul W. Carleton Elementary School

ECM-2: Replace Electric DHW Heaters w/ Tankless Condensing Gas-Fired DHW Heaters

Summary

* Replace two (2) Electric DHW Heater w/ two (2) Instantaneous, Condensing, Gas-Fired DHW Heater

Item	Value	Units	Formula/Comment
Occupied days per week	5	days/wk	
Water supply Temperature	55	˚F	Termperature of water coming into building
Hot Water Temperature	120	˚F	
Hot Water Usage per day	401	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	56,487	MBTU/yr	water to setpoint
Existing Tank Size	170	Gallons	Per manufacturer nameplate
Hot Water Temperature	120	˚F	Per building personnel
Average Room Temperature	70	˚F	
Standby Losses (% by Volume)	2.5%		Department of Energy)
Standby Losses (Heat Loss)	1.8	MBH	
Annual Standby Hot Water Load	15,513	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	71,999	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	90%		Per Manufacturer
Total Annual Energy Required	79,999	Mbtu/yr	
Total Annual Electric Required	**23,440**	**kWh/yr**	**Electrical Savings**
Average Annual Electric Demand	2.68	kW	
Peak Electric Demand	**22.50**	**kW**	**Per Manufacturer's Nameplate**
New Tank Size	1	Gallons	tankless
Hot Water Temperature	120	˚F	
Average Room Temperature	70	˚F	
Standby Losses (% by Volume)	2.5%		Department of Energy)
Standby Losses (Heat Loss)	0.0	MBH	
Annual Standby Hot Water Load	91	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	56,578	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		condensing DHW Heater
Proposed Total Annual Energy Required	58,935	MBTU/yr	
Proposed Fuel Use	589	Therms/yr	eliminated
Elec Utility Demand Unit Cost	$6.01	$/kW	
Elec Utility Supply Unit Cost	$0.11	$/kWh	
NG Utility Unit Cost	$1.07	$/Therm	
Existing Operating Cost of DHW	$4,133	$/yr	
Proposed Operating Cost of DHW	$631	$/yr	
Annual Utility Cost Savings	**$3,502**	**$/yr**	

Daily Hot Water Demand

			#USES PER DAY		FULL TIME				
FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	MALE	FEMALE	MALE	FEMALE	TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
LAVATORY (Low-Flow Lavs use 0.5 GPM)	2.5	0.25	3	3	200	200	750	50%	375
SHOWER	2.5	5	1	1			0	75%	0
KITCHEN SINK	2.5	0.5	2	2	4	2	15	75%	11
MOP SINK	2.5	2	2	2	2		20	75%	15
Dishwasher (gal per u	10	1	4	0			0	100%	0
						TOTAL	785		**401**

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Gas-Fired DHW Heater Removal	2	LS		$ 150		$ -	$ 405	$ -	$ 405	
High Efficiency Gas-Fired DHW Heater	2	LS	$ 2,000	$ 1,000		$ 4,400	$ 2,700	$ -	$ 7,100	
Miscellaneous Electrical	2	LS	$ 300	$ 500		$ 660	$ 1,350	$ -	$ 2,010	
Venting Kit	2	EA	$ 450	$ 650		$ 990	$ 1,755	$ -	$ 2,745	
Miscellaneous Piping and Valves	2	LS	$ 200			$ 440	$ -	$ -	$ 440	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

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

$ 12,700		Subtotal
$ 1,270	10%	Contingency
$ 2,794	20%	Contractor O&P
$ -		
$ 16,764		**Total**

Penns Grove NJBPU
CHA # 24510
Paul W. Carleton Elementary School

ECM-3: Install Door 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	75%		Ex Occupied Clng Temp.	70	*F	Ex Occupied Htg Temp.	65 *F
Cooling System Efficiency		kW/ton	Ex Unoccupied Clng Temp.	78	*F	Ex Unoccupied Htg Temp.	62 *F
Linear Feet of Door Edge	429.47		Cooling Occ Enthalpy Setpoint	27.5	Btu/lb	Electricity	$ - $/kWh
Existing Infiltration Factor*	1.5	cfm/LF	Cooling Unocc Enthalpy Setpoint	27.5	Btu/lb	Natural Gas	$ 1.07 $/therm
Proposed Infiltration Factor*	0.45	cfm/LF					

*Infiltration Factor per Carrier Handbook of Air Conditioning System Design based on average door seal gap calculated below.

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy therms	Proposed Heating Energy therms
A		B	C	D	E	F	G	H	I	J	K	L
97.5	39.7	9	2	7	-20,485	-20,485	-6,145	-6,145	0	0	0	0
92.5	37.7	69	16	53	-17,126	-17,126	-5,138	-5,138	0	0	0	0
87.5	35.7	132	31	101	-13,768	-13,768	-4,130	-4,130	0	0	0	0
82.5	33.7	344	82	262	-10,410	-10,410	-3,123	-3,123	0	0	0	0
77.5	31.3	566	135	431	-6,380	0	-1,914	0	0	0	0	0
72.5	29.7	755	180	575	-3,694	0	-1,108	0	0	0	0	0
67.5	28	780	186	594	0	0	0	0	0	0	0	0
62.5	25.2	889	212	677	1,007	0	302	0	0	0	3	1
57.5	21.8	742	177	565	3,022	1,813	907	544	0	0	21	6
52.5	18.8	627	149	478	5,037	3,828	1,511	1,148	0	0	34	10
47.5	16.9	725	173	552	7,052	5,843	2,116	1,753	0	0	59	18
42.5	14.5	795	189	606	9,067	7,858	2,720	2,357	0	0	86	26
37.5	12.7	784	187	597	11,082	9,873	3,325	2,962	0	0	106	32
32.5	10.9	682	162	520	13,097	11,888	3,929	3,566	0	0	111	33
27.5	8.8	345	82	263	15,112	13,903	4,533	4,171	0	0	65	20
22.5	7.2	229	55	174	17,126	15,918	5,138	4,775	0	0	49	15
17.5	5.6	189	45	144	19,141	17,932	5,742	5,380	0	0	46	14
12.5	4.1	70	17	53	21,156	19,947	6,347	5,984	0	0	19	6
7.5	2.7	20	5	15	23,171	21,962	6,951	6,589	0	0	6	2
2.5	1.3	8	2	6	25,186	23,977	7,556	7,193	0	0	3	1
2.5	#REF!	36	13	23	43,484	41,397	13,045	12,419	0	0	20	6
TOTALS		**8,796**	**2,099**	**6,697**					**0**	**0**	**629**	**189**

Existing Door Infiltration	**644**	**cfm**
Existing Unoccupied Door Infiltration	**644**	**cfm**
Proposed Door Infiltration	**193**	**cfm**
Proposed Unoccupied Door Infiltration	**193**	**cfm**

Savings	**440**	**therms**	**$**	**471**
	0	**kWh**	**$**	**-**
			$	**471**

Door	Width (ft)	Height (ft)	Linear Feet (LF)	gap (in)	gap location	LF of gap	% door w/ gap	Average gap for door (in)
1a			0	0.25	bottom/seam		#DIV/0!	#DIV/0!
1b			0	0.25	bottom/seam		#DIV/0!	#DIV/0!
2a			0	0.25	all sides		#DIV/0!	#DIV/0!
2b			0	0.25	all sides		#DIV/0!	#DIV/0!
3a			0	0.125	all sides		#DIV/0!	#DIV/0!
4a			0	0.125	all sides		#DIV/0!	#DIV/0!
4b			0	0.125	all sides		#DIV/0!	#DIV/0!
5			0	0.0625	all sides		#DIV/0!	#DIV/0!
6a			0	0.25	bottom/seam		#DIV/0!	#DIV/0!
6b			0	0.25	bottom/seam		#DIV/0!	#DIV/0!
7			0	0.0625	all sides		#DIV/0!	#DIV/0!
8a			0	0.25	bottom/seam		#DIV/0!	#DIV/0!
8b			0	0.25	bottom/seam		#DIV/0!	#DIV/0!
8c			0	0.25	bottom/seam		#DIV/0!	#DIV/0!
8d			0	0.25	bottom/seam		#DIV/0!	#DIV/0!
9			0	0.0625	all sides		#DIV/0!	#DIV/0!
Total	**0**	**0**	**0**	**0.191**		**0**	**#DIV/0!**	**#DIV/0!**

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

Multipliers	
Material:	0.98
Labor:	1.22
Equipment:	1.09

ECM-M24B: Install Door Seals Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									$ -	
Door Seals (3'x7')	26	ea	$ 35	$ 50	$ -	$ 888	$ 1,591	$ -	$ 2,479	
36" Door Threshold Seal	26	ea	$ 50.00	$ 45.00	$ -	$ 1,269	$ 1,432	$ -	$ 2,701	
Side and Top Door Seal	26	ft	$ 3.00	$ 3.00		$ 76	$ 95	$ -	$ 172	
						$ -	$ -	$ -	$ -	

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

$ 5,352	Subtotal
$ -	
$ -	
$ -	
$ 5,352	**Total**

Penns Grove-Carneys Point Regional School District - NJBPU
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Paul W. Carleton Elementary School

EQUIPMENT	AREA/EQUIPMENT SERVED	Cooling Capacity (Tons)	COOLING CAPACITY (MBH)	Model EER
AHU-1		5	60,000	10.0
AHU-2		6.5	78,000	9.0
AHU-3		2.5	30,000	9.1
AHU-4		12	144,000	9.2
		Total Electric DX Cooling:	*252,000 MBH*	9.3 *EER*

ECM-4: DX Split Systems Replaced

ECM Description Summary

By replacing older split system DX equipment with higher SEER/EER DX condensing units, significant electrical energy can be saved. Control schemes can be incorporated that were not possible with the older equiopment as well, but the equipment can also operate in same manner as existing (i.e., stand alone, or monitored/sequenced by a BAS). It is recommended these units be replaced by more modern DX split system equipment with high efficiecny fans and compressors.

ASSUMPTIONS			Comments
Electric Cost	$0.126	/ kWh	
Average run hours per Week	88	Hours	Based building occupied hours 6:30am-11pm, 5 days/wk
Space Balance Point	55	F	
Space Temperature Setpoint	74	deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	252,000	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	9.3		Based off average EER of units listed above
Existing Annual Electric Usage	4,204	kWh	

Item	Value	Units	Comments
Proposed EER	14.0		New ductless mini-splits (per manufacturer)
Proposed Annual Electric Usage	2,800	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Electrical Usage Savings	1,404	kWh
Annual Cost Savings	$176	
Total Project Cost	$37,600	
Simple Payback	213	years

OAT - DB Bin Temp F	Annual Hours	Cooling Hrs at Temp Above balance point	Assumed % of time of operation	Assumed hrs of Operation
102.5	0	0	100%	0
97.5	2	1	100%	1
92.5	34	18	88%	16
87.5	55	29	76%	22
82.5	132	69	65%	44
77.5	263	137	53%	73
72.5	362	0	0%	0
67.5	571	0	0%	0
62.5	734	0	0%	0
57.5	663	0	0%	0
52.5	613	0	0%	0
47.5	721	0	0%	0
42.5	795	0	0%	0
37.5	784	0	0%	0
32.5	682	0	0%	0
27.5	345	0	0%	0
22.5	229	0	0%	0
17.5	189	0	0%	0
12.5	70	0	0%	0
7.5	20	0	0%	0
2.5	8	0	0%	0
0.0	0	0	0%	0
0.0	0	0	0%	0
Total	7,272	253	61%	156

Penns Grove School District - NJBPU
CHA Project #24510
Field Street Elementary School

ECM-6: DX Split Systems Replaced - Cost

Multipliers	
Material:	0.98
Labor:	1.22
Equipment:	1.09

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Existing (4) Acs & CUs demolition	4	EA		$ 500		$ -	$ 2,448	$ -	$ 2,448	
(1) AC, 2.5 ton air conditioner condensing units	1	EA	$ 1,000	$ 500		$ 976	$ 612	$ -	$ 1,588	
(1) AC, 5 ton air conditioner condensing unit	1	EA	$ 2,000	$ 750		$ 1,952	$ 918	$ -	$ 2,870	
(1) AC, 6.5 ton air conditioner condensing unit	1	EA	$ 2,500	$ 1,000		$ 2,440	$ 1,224	$ -	$ 3,664	
(1) AC, 12 ton air conditioner condensing unit	1	EA	$ 4,500	$ 1,500		$ 4,392	$ 1,836	$ -	$ 6,228	
Contols	4	EA	$ 500	$ 500		$ 1,952	$ 2,448	$ -	$ 4,400	
Electrical - misc.	4	LS	$ 500	$ 500		$ 1,952	$ 2,448	$ -	$ 4,400	
						$ -	$ -	$ -	$ -	

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

$ 25,598	Subtotal
$ 2,560	10% Contingency
$ 5,120	20% Contractor O&P
$ -	0% Engineering
$ 33,300	**Total**

Penns Grove NJBPU
CHA # 24510
Paul W. Carleton Elementary School

TITLE: **Booster Heater Conversion (Electric to Gas)**
PROJECT: Penns Grove-Carneys Point Regional School District - NJBPU
SITE: Paul W. Carleton Elementary School

DESCRIPTION: When fuel costs are less expensive than electric, converting from electric to fuel heating results in reduce cost.

GIVEN:	Electrical Energy Cost	=	$0.107	$/kWh
	Electrical Demand Cost	=	$ 6.01	$/kW
	Fuel Energy Cost	=	$1.07	$/Therm (Nat'l Gas)
	Booster Heater Capacity	=	45	Kw
	Operation (Hours/Day)	=	4.00	Hours/Day
	Operation (Days/Year)	=	180.00	Day/Year
	Operation (Hours/Year)	=	720	Hours/Year
ASSUMPTION:	Efficiency (Fuel)	=	80%	
	Efficiency (Electric)	=	100%	
	Operating Months per Year	=	10	
	Scheduled Usage	=	70%	
	Utilization Factor (Demand)	=	10%	

FORMULA:
Energy Use (Kwh) = (Capacity(Kw)) x (Hours of Operation/Year) x (Scheduled Usage) / (Efficiency)
Fuel Use (Unit) = (Electrical Use(Kwh)) x (3413 btu/kw) x (Electrical Efficiency) / (Fuel Efficiency) / (Heating Value of Fuel)
Energy Demand (Kw) = (Capacity (Kw)) x (Months/Year) x (Demand Utilization Factor)
Electrical Energy Cost ($) = (Energy Cost (Kwh) x ($/Kwh)) + (Demand (Kw) x ($/Kw))
Fuel Energy Cost ($) = ((Fuel Use(Unit) x Fuel Cost($/Unit))

CALCULATION:

	Capacity		Hours/Year		Scheduled Usage		Efficiency		
Electric Usage = (	45	)x(	720	)x(	70%	)/(	100%	) =	**22,680 Kwh**

	Electrical Use		Conversion		Efficiency (Electric)		Efficiency (Fuel)		Conversion		
Fuel Usage = (	22,680	)x(	3,413	) x (	100%	)/(	80%	)/(	100,000	) =	**968 Therm**

	Capacity		Months/Year		Utilization Factor		
Electric Demand =(	45	)*(	10	)*(	10%	) =	**45 Kw**

	Kwh		$/kwh		Kw		$/Kw		
Existing Energy Cost = (	**22,680**	)*(	$0.107	)+(	**45**	)*(	$6.01	) =	**$ 2,699**

	Therm		$/fuel unit		
Proposed Energy Cost = (	**968**	)*(	$1.071	) =	**$ 1,036**

Result

	Existing Annual Use=	**22,680**	**Kwh**	**45**	**Kw**	**$**	**2,699**
	Proposed Annual Use=			**968**	**Therm**	**$**	**1,036**
100%	**Annual Savings=**	**22,680**	**Kwh**	**45**	**Kw**	**$**	**1,663**
	Savings as Percent of Existing =			**(968)**	**Therm**		**62%**

0

Penns Grove-Carneys Point Regional School District - NJBPU
Penns Grove High School

ECM-6: Replace Electric Booster Heater with Natural Gas - Cost

Multipliers	
Material:	0.98
Labor:	1.22
Equipment:	1.09

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Existing Heater Demolition	1	EA		$ 500	$ -	$ -	$ 612	$ -	$ 612	
Natural Gas Booster Heater	1	Ea	$ 6,000	$ 2,000		$ 5,856	$ 2,448	$ -	$ 8,304	
Natural Gas Piping	1	LS	$ 200	$ 1,000	$ -	$ 195	$ 1,224	$ -	$ 1,419	
venting	1	EA	$ 450	$ 650						
Wiring	1	LS	$ 500	$ 500	$ -	$ 488	$ 612	$ -	$ 1,100	

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

$ 11,400	Subtotal
$ 2,300.00	20% Contingency
$ 1,700.00	15% Contractor O&P
$ -	0% Engineering
$ 15,400	**Total**

Penns Grove NJBPU
CHA # 24510
Paul W. Carleton Elementary School

ECM-W1: Replace urinals and flush valves with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$8.20	$ / kGal
Urinals in Building	7	
Average Flushes / Urinal (per Day)	4	
Average Gallons / Flush	3.0	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	7	
Proposed Gallons / Flush	0.1	Gal
Proposed Material Cost	$1,000	
Proposed Installation Cost	$1,000	
Total cost of new urinals & valves	$14,000	

SAVINGS		
Current Urinal Water Use	31	kGal / year
Proposed Urinal Water Use	1	kGal / year
Water Savings	29	kGal / year
Cost Savings	$241	/ year
Simple Payback	58.1	years

Penns Grove NJBPU
CHA # 24510
Paul W. Carleton Elementary School

ECM-W3: Replace toilets and flush valves with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$8.20	$ / kGal
Toilets in Building	29	
Average Flushes / Toilet (per Day)	4	
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	29	
Proposed Gallons / Flush	1.3	Gal
Proposed Material Cost of new Flush	$1,000	
Proposed Installation cost of new	$1,000	
Total cost of new toilets & valves	$58,000	

SAVINGS		
Current Toilet Water Use	148	kGal / year
Proposed Toilet Water Use	56	kGal / year
Water Savings	92	kGal / year
Cost Savings	$754	/ year
Simple Payback	76.93	years

Penns Grove NJBPU
CHA # 24510
Paul W. Carleton Elementary School

ECM-W4: Replace faucets with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$8.20	$ / kGal
Faucets in Building	25	
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	25	
Proposed Flowrate	0.5	gpm
Proposed Material Cost of new Faucets	$700	
Proposed Installation cost of new	$300	
Total cost of new faucets	$25,000	

SAVINGS		
Current Faucet Water Use	55	kGal / year
Proposed Faucet Water Use	9	kGal / year
Water Savings	46	kGal / year
Cost Savings	$374	/ year
Simple Payback	66.8	years

ECM-1 Lighting Replacements

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$73,373	**17.6**	**56,755**	**0**	**$9,390**	**0**	**$9,390**	**$4,810**	**7.8**	**7.3**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-2 Install Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$11,948	**0.0**	**51,031**	**0**	**$7,302**	**0**	**$7,302**	**$2,065**	**1.6**	**1.4**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-3 Lighting Replacements with Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$85,321	**17.6**	**93,932**	**0**	**$14,710**	**0**	**$14,710**	**$6,875**	**5.8**	**5.3**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Energy Audit of Penns Grove School District

CHA Project No.24510

ECM-1 Lighting Replacements

Cost of Electricity: **$0.143 $/kWh**

$6.01 $/kW

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**NYSERDA Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Annual kWh**	**Number of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Retrofit Control**	**Annual Hours**	**Annual kWh**	**Annual kWh Saved**	**Annual kW Saved**	**Annual $ Saved**	**Retrofit Cost**	**NJ Smart Start Lighting Incentive**	**Simple Payback With Out Incentive**	**Simple Payback**
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
191	Boiler Room	2	S 60 C F 2 (ELE) 8'	F82EE	123	0.2	SW	1000	246	2	S 60 C F 2 (ELE) 8'	F82EE	123	0.2	SW	1,000	246	-	0.0	$ -	$ -	$0		#DIV/0!
21	Boiler Room	1	1B 34 C F 4 (MAG)	F44EE	144	0.1	SW	1000	144	1	1B 28 C F 4	F44SSILL	96	0.1	SW	1,000	96	48	0.0	$ 10.33	$ 141.75	$0	13.7	3.0
18	Boiler Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1000	224	2	0	F44SSILL	96	0.2	SW	1,000	192	32	0.0	$ 6.89	$ 212.50	$20	30.9	6.0
71	Boiler Room	1	I 60	I60/1	60	0.1	SW	1000	60	1	CF 26	CFQ26/1-L	27	0.0	SW	1,000	27	33	0.0	$ 7.10	$ 6.75	$0	1.0	0.2
47	Boys Bathroom	3	1B 34 C F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	1B 28 C F 2	F42SSILL	48	0.1	SW	2,000	288	144	0.1	$ 25.80	$ 384.75	$0	14.9	2.7
16	213	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	214	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	211	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	Hallway (2nd Floor)	24	T 34 R F 2 (MAG)	F42EE	72	1.7	SW	2280	3,940	24	T 28 R F 2	F42SSILL	48	1.2	SW	2,280	2,627	1,313	0.6	$ 229.47	$ 2,754.00	$240	12.0	1.9
16	212	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	209	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	210	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	207	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	208	10	T 34 R F 2 (MAG)	F42EE	72	0.7	SW	2912	2,097	10	T 28 R F 2	F42SSILL	48	0.5	SW	2,912	1,398	699	0.2	$ 117.32	$ 1,147.50	$100	9.8	1.5
71	Janitor Closet	1	I 60	I60/1	60	0.1	SW	1000	60	1	CF 26	CFQ26/1-L	27	0.0	SW	1,000	27	33	0.0	$ 7.10	$ 6.75	$0	1.0	0.2
47	Girls Bathroom	3	1B 34 C F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	1B 28 C F 2	F42SSILL	48	0.1	SW	2,000	288	144	0.1	$ 25.80	$ 384.75	$0	14.9	2.7
16	Faculty Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	5000	1,440	4	T 28 R F 2	F42SSILL	48	0.2	SW	5,000	960	480	0.1	$ 75.61	$ 459.00	$40	6.1	0.9
71	Faculty Room	1	I 60	I60/1	60	0.1	SW	5000	300	1	CF 26	CFQ26/1-L	27	0.0	SW	5,000	135	165	0.0	$ 25.99	$ 6.75	$0	0.3	0.0
47	Faculty Room Bath Room	1	1B 34 C F 2 (MAG)	F42EE	72	0.1	SW	2000	144	1	1B 28 C F 2	F42SSILL	48	0.0	SW	2,000	96	48	0.0	$ 8.60	$ 128.25	$0	14.9	2.7
172-A	Faculty Room	3	W 20 W F 2 (MAG)	F22SS	56	0.2	SW	5000	840	3	W 17 W F 2	F22ILL	33	0.1	SW	5,000	495	345	0.1	$ 54.34	$ 303.75	$0	5.6	0.9
35	Men/Womens Bathroom (2nd Floor)	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2000	180	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2,000	180	-	0.0	$ -	$ -	$0		
16	Stairway Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2912	839	4	T 28 R F 2	F42SSILL	48	0.2	SW	2,912	559	280	0.1	$ 46.93	$ 459.00	$40	9.8	1.5
35	Handicapped Bathroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2000	180	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2,000	180	-	0.0	$ -	$ -	$0		
16	205	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	206	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	203	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	204	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	201	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	202	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
13	Stairway	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	3200	768	4	0	F42SSILL	48	0.2	SW	3,200	614	154	0.0	$ 25.44	$ 425.00	$40	16.7	2.5
174	Entryway	3	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOW	F43EE	115	0.3	SW	2280	787	3	W 28 W F 3	F43SSILL	72	0.2	SW	2,280	492	294	0.1	$ 51.39	$ 384.75	$0	7.5	1.3
141	Gym	20	HPS 250	HPS250/1	295	5.9	SW	2912	17,181	20	HPS 250	HPS250/1	295	5.9	SW	2,912	17,181	-	0.0	$ -	$ -	$0		
174	Gym Office	1	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOW	F43EE	115	0.1	SW	3000	345	1	W 28 W F 3	F43SSILL	72	0.1	SW	3,000	216	129	0.0	$ 21.56	$ 128.25	$0	5.9	1.0
16	Gym Storage	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288	4	T 28 R F 2	F42SSILL	48	0.2	SW	1,000	192	96	0.1	$ 20.66	$ 459.00	$40	22.2	4.4
174	Gym Boys Bathroom	2	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOW	F43EE	115	0.2	SW	2000	460	2	W 28 W F 3	F43SSILL	72	0.1	SW	2,000	288	172	0.1	$ 30.82	$ 256.50	$0	8.3	1.5
174	Gym Girls Bathroom	2	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOW	F43EE	115	0.2	SW	2000	460	2	W 28 W F 3	F43SSILL	72	0.1	SW	2,000	288	172	0.1	$ 30.82	$ 256.50	$0	8.3	1.5
16	100	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2912	839	4	T 28 R F 2	F42SSILL	48	0.2	SW	2,912	559	280	0.1	$ 46.93	$ 459.00	$40	9.8	1.5
16	Nurse	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	3000	432	2	T 28 R F 2	F42SSILL	48	0.1	SW	3,000	288	144	0.0	$ 24.07	$ 229.50	$20	9.5	1.5
71	Nurse	2	I 60	I60/1	60	0.1	SW	3000	360	2	CF 26	CFQ26/1-L	27	0.1	SW	3,000	162	198	0.1	$ 33.09	$ 13.50	$0	0.4	0.1
16	101	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	104	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	104	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
35	Conference Room	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	1200	324	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	1,200	324	-	0.0	$ -	$ -	$0		
16	Cafeteria	38	T 34 R F 2 (MAG)	F42EE	72	2.7	SW	1600	4,378	38	T 28 R F 2	F42SSILL	48	1.8	SW	1,600	2,918	1,459	0.9	$ 274.59	$ 4,360.50	$380	15.9	2.7
16	Kitchen	8	T 34 R F 2 (MAG)	F42EE	72	0.6	SW	1600	922	8	T 28 R F 2	F42SSILL	48	0.4	SW	1,600	614	307	0.2	$ 57.81	$ 918.00	$80	15.9	2.7
71	Kitchen Freezer	1	I 60	I60/1	60	0.1	SW	8760	526	1	CF 26	CFQ26/1-L	27	0.0	SW	8,760	237	289	0.0	$ 43.74	$ 6.75	$0	0.2	0.0
71	Back Kitchen Entryway	7	I 60	I60/1	60	0.4	SW	2280	958	7	CF 26	CFQ26/1-L	27	0.2	SW	2,280	431	527	0.2	$ 92.03	$ 47.25	$0	0.5	0.1
16	Handicapped Bathroom	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	144	1	T 28 R F 2	F42SSILL	48	0.0	SW	2,000	96	48	0.0	$ 8.60	$ 114.75	$10	13.3	2.2
16	Womens Bathroom	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	144	1	T 28 R F 2	F42SSILL	48	0.0	SW	2,000	96	48	0.0	$ 8.60	$ 114.75	$10	13.3	2.2
71	Girls Bathroom	6	I 60	I60/1	60	0.4	SW	2000	720	6	CF 26	CFQ26/1-L	27	0.2	SW	2,000	324	396	0.2	$ 70.95	$ 40.50	$0	0.6	0.1
71	Janitor Closet	1	I 60	I60/1	60	0.1	SW	1000	60	1	CF 26	CFQ26/1-L	27	0.0	SW	1,000	27	33	0.0	$ 7.10	$ 6.75	$0	1.0	0.2
71	Stairway	6	I 60	I60/1	60	0.4	SW	3200	1,152	6	CF 26	CFQ26/1-L	27	0.2	SW	3,200	518	634	0.2	$ 104.95	$ 40.50	$0	0.4	0.1
16	108	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	107	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	110	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	109	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	112	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
16	111	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
35	114	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2912	1,572	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2,912	1,572	-	0.0	$ -	$ -	$0		
16	113	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	SW	2,912	1,677	839	0.3	$ 140.78	$ 1,377.00	$120	9.8	1.5
18	Boys Bathroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2000	448	2	0	F44SSILL	96	0.2	SW	2,000	384	64	0.0	$ 11.47	$ 212.50	$20	18.5	3.0
18	Library	27	T 32 R F 4 (ELE)	F44ILL	112	3.0	SW	2912	8,806	27	0	F44SSILL	96	2.6	SW	2,912	7,548	1,258	0.4	$ 211.17	$ 2,868.75	$270	13.6	2.1
18	Library Office	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	3000	1,344	4	0	F44SSILL	96	0.4	SW	3,000	1,152	192	0.1	$ 32.09	$ 425.00	$40	13.2	2.0
16	318	6	T 34 R F 2 (MAG)	F42EE	72	0.4	SW	2912	1,258	6	T 28 R F 2	F42SSILL	48	0.3	SW	2,912	839	419	0.1	$ 70.39	$ 688.50	$60	9.8	1.5
35	309	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2912	786	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2,912	786	-	0.0	$ -	$ -	$0		
35	311 - Computer Lab	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2912	3,931	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2,912	3,931	-	0.0	$ -	$ -	$0		
16	308	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2912	210	1	T 28 R F 2	F42SSILL	48	0.0	SW	2,912	140	70	0.0	$ 11.73	$ 114.75	$10	9.8	1.5
35	317	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2912	3,931	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2,912	3,931	-	0.0	$ -	$ -	$0		
35	312	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2912	1,572	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2,912	1,572	-	0.0	$ -	$ -	$0		
35	Office PC Room	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3000	270	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3,000	270	-	0.0	$ -	$ -	$0		
16	Outdoor Storage Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288	4	T 28 R F 2	F42SSILL	48	0.2	SW	1,000	192	96	0.1	$ 20.66	$ 459.00	$40	22.2	4.4
35	317 Storage	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	1000	270	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	1,000	270	-	0.0	$ -	$ -	$0		
16	315 Storage	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288	4	T 28 R F 2	F42SSILL	48	0.2	SW	1,000	192	96	0.1	$ 20.66	$ 459.00	$40	22.2	4.4
18	Main Office	11	T 32 R F 4 (ELE)	F44ILL	112	1.2	SW	3000	3,696	11	0	F44SSILL	96	1.1	SW	3,000	3,168	528	0.2	$ 88.25	$ 1,168.75	$110	13.2	2.0
16	Server Room	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	T 28 R F 2	F42SSILL	48	0.0	SW	1,000	48	24	0.0	$ 5.17	$ 114.75	$10	22.2	4.4
71	Main Office Bathroom	3	I 60	I60/1	60	0.2	SW	2000	360	3	CF 26	CFQ26/1-L	27	0.1	SW	2,000	162	198	0.1	$ 35.47	$ 20.25	$0	0.6	0.1
141LED	Exterior	29	HPS 200	HPS200/1	250	7.3	SW	4368	31,668	29	FXLED78	FXLED78/1	78	2.3	SW	4,368	9,880	21,788	5.0	$ 3,477.42	$ 20,459.50	$290	5.9	0.9
236	Exterior	8	R 75 C Q 1	h75/1	75	0.6	SW	4368	2,621	8	CF 26	CFQ26/1-L	27	0.2	SW	4,368	943	1,677	0.4	$ 267.71	$ 54.00	$0	0.2	0.0
146	Exterior	1	High Bay MH 400	MH400/1	458	0.5	SW	4368	2,001	1	P 54 C F 4	FC20	20	0.0	SW	4,368	87	1,913	0.4	$ 305.35	$ -	$100	0.0	-0.1
143	Exterior	10	HPS 100 POLE	HPS100/1	138	1.4	SW	4368	6,028	10	HPS 100 POLE	HPS100/1	138	1.4	SW	4,368	6,028	-	0.0	$ -	$ -	$0		
	Total	**614**				**57.8**			**172,090**	**614**			**4,812**	**40.2**			**115,335**	**56,755**	**17.6**	**$9,390**	**$73,373**	**$4,810**		
																	Demand Savings			**17.6**	**$1,269**			
																	kWh Savings			**56,755**	**$8,121**			
																	Total savings				**$9,390**		**7.8**	**7.3**

Energy Audit of Penns Grove School District

CHA Project No.24510

ECM-2 Install Occupancy Sensors

Cost of Electricity: **$0.143 $/kWh**

$6.01 $/kW

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**NYSERDA Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Annual kWh**	**Number of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Retrofit Control**	**Annual Hours**	**Annual kWh**	**Annual kWh Saved**	**Annual kW Saved**	**Annual $ Saved**	**Retrofit Cost**	**NJ Smart Start Lighting Incentive**	**Simple Payback With Out Incentive**	**Simple Payback**
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated 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
191	Boiler Room	2	S 60 C F 2 (ELE) 8'	F82EE	123	0.2	SW	1000	246.0	2	S 60 C F 2 (ELE) 8'	F82EE	123	0.2	C-OCC	1000	246.0	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
21	Boiler Room	1	1B 34 C F 4 (MAG)	F44EE	144	0.1	SW	1000	144.0	1	1B 34 C F 4 (MAG)	F44EE	144	0.1	C-OCC	1000	144.0	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
18	Boiler Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1000	224.0	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1000	224.0	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
71	Boiler Room	1	I 60	I60/1	60	0.1	SW	1000	60.0	1	I 60	I60/1	60	0.1	C-OCC	1000	60.0	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
47	Boys Bathroom	3	1B 34 C F 2 (MAG)	F42EE	72	0.2	SW	2000	432.0	3	1B 34 C F 2 (MAG)	F42EE	72	0.2	NONE	1000	216.0	216.0	0.0	$30.91	$0.00	$0.00	0.0	0.0
16	213	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	214	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	211	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	Hallway (2nd Floor)	24	T 34 R F 2 (MAG)	F42EE	72	1.7	SW	2280	3,939.8	24	T 34 R F 2 (MAG)	F42EE	72	1.7	NONE	2280	3,939.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
16	212	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	209	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	210	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	207	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	208	10	T 34 R F 2 (MAG)	F42EE	72	0.7	SW	2912	2,096.6	10	T 34 R F 2 (MAG)	F42EE	72	0.7	C-OCC	1456	1,048.3	1,048.3	0.0	$150.00	$202.50	$35.00	1.3	1.1
71	Janitor Closet	1	I 60	I60/1	60	0.1	SW	1000	60.0	1	I 60	I60/1	60	0.1	C-OCC	500	30.0	30.0	0.0	$4.29	$202.50	$35.00	47.2	39.0
47	Girls Bathroom	3	1B 34 C F 2 (MAG)	F42EE	72	0.2	SW	2000	432.0	3	1B 34 C F 2 (MAG)	F42EE	72	0.2	NONE	1000	216.0	216.0	0.0	$30.91	$0.00	$0.00	0.0	0.0
16	Faculty Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	5000	1,440.0	4	T 34 R F 2 (MAG)	F42EE	72	0.3	C-OCC	3000	864.0	576.0	0.0	$82.42	$202.50	$35.00	2.5	2.0
71	Faculty Room	1	I 60	I60/1	60	0.1	SW	5000	300.0	1	I 60	I60/1	60	0.1	C-OCC	3000	180.0	120.0	0.0	$17.17	$202.50	$35.00	11.8	9.8
47	Faculty Room Bath Room	1	1B 34 C F 2 (MAG)	F42EE	72	0.1	SW	2000	144.0	1	1B 34 C F 2 (MAG)	F42EE	72	0.1	NONE	1000	72.0	72.0	0.0	$10.30	$0.00	$0.00	0.0	0.0
172-A	Faculty Room	3	W 20 W F 2 (MAG)	F22SS	56	0.2	SW	5000	840.0	3	W 20 W F 2 (MAG)	F22SS	56	0.2	C-OCC	3000	504.0	336.0	0.0	$48.08	$202.50	$35.00	4.2	3.5
35	Men/Womens Bathroom (2nd Floor)	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2000	180.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	NONE	1000	90.0	90.0	0.0	$12.88	$0.00	$0.00	0.0	0.0
16	Stairway Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2912	838.7	4	T 34 R F 2 (MAG)	F42EE	72	0.3	NONE	1456	419.3	419.3	0.0	$60.00	$0.00	$0.00	0.0	0.0
35	Handicapped Bathroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2000	180.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	NONE	1000	90.0	90.0	0.0	$12.88	$0.00	$0.00	0.0	0.0
16	205	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	206	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	203	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	204	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	201	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	202	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
13	Stairway	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	3200	768.0	4	S 32 P F 2 (ELE)	F42LL	60	0.2	NONE	3200	768.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
174	Entryway	3	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOW	F43EE	115	0.3	SW	2280	786.6	3	W 34 W F 3 (MAG) BED LAMP 2 UP	F43EE	115	0.3	NONE	2280	786.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
141	Gym	20	HPS 250	HPS250/1	295	5.9	SW	2912	17,180.8	20	HPS 250	HPS250/1	295	5.9	NONE	2912	17,180.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
174	Gym Office	1	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOW	F43EE	115	0.1	SW	3000	345.0	1	W 34 W F 3 (MAG) BED LAMP 2 UP	F43EE	115	0.1	C-OCC	1500	172.5	172.5	0.0	$24.68	$202.50	$35.00	8.2	6.8
16	Gym Storage	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288.0	4	T 34 R F 2 (MAG)	F42EE	72	0.3	C-OCC	250	72.0	216.0	0.0	$30.91	$202.50	$35.00	6.6	5.4
174	Gym Boys Bathroom	2	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOW	F43EE	115	0.2	SW	2000	460.0	2	W 34 W F 3 (MAG) BED LAMP 2 UP	F43EE	115	0.2	NONE	1000	230.0	230.0	0.0	$32.91	$0.00	$0.00	0.0	0.0
174	Gym Girls Bathroom	2	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOW	F43EE	115	0.2	SW	2000	460.0	2	W 34 W F 3 (MAG) BED LAMP 2 UP	F43EE	115	0.2	NONE	1000	230.0	230.0	0.0	$32.91	$0.00	$0.00	0.0	0.0
16	100	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2912	838.7	4	T 34 R F 2 (MAG)	F42EE	72	0.3	C-OCC	1456	419.3	419.3	0.0	$60.00	$202.50	$35.00	3.4	2.8
16	Nurse	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	3000	432.0	2	T 34 R F 2 (MAG)	F42EE	72	0.1	C-OCC	1500	216.0	216.0	0.0	$30.91	$202.50	$35.00	6.6	5.4
71	Nurse	2	I 60	I60/1	60	0.1	SW	3000	360.0	2	I 60	I60/1	60	0.1	C-OCC	1500	180.0	180.0	0.0	$25.76	$202.50	$35.00	7.9	6.5
16	101	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	104	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	104	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
35	Conference Room	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	1200	324.0	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	1000	270.0	54.0	0.0	$7.73	$202.50	$35.00	26.2	21.7
16	Cafeteria	38	T 34 R F 2 (MAG)	F42EE	72	2.7	SW	1600	4,377.6	38	T 34 R F 2 (MAG)	F42EE	72	2.7	NONE	1200	3,283.2	1,094.4	0.0	$156.60	$0.00	$0.00	0.0	0.0
16	Kitchen	8	T 34 R F 2 (MAG)	F42EE	72	0.6	SW	1600	921.6	8	T 34 R F 2 (MAG)	F42EE	72	0.6	NONE	1200	691.2	230.4	0.0	$32.97	$0.00	$0.00	0.0	0.0
71	Kitchen Freezer	1	I 60	I60/1	60	0.1	SW	8760	525.6	1	I 60	I60/1	60	0.1	C-OCC	0	0.0	525.6	0.0	$75.21	$202.50	$35.00	2.7	2.2
71	Back Kitchen Entryway	7	I 60	I60/1	60	0.4	SW	2280	957.6	7	I 60	I60/1	60	0.4	NONE	2280	957.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
16	Handicapped Bathroom	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	144.0	1	T 34 R F 2 (MAG)	F42EE	72	0.1	NONE	1000	72.0	72.0	0.0	$10.30	$0.00	$0.00	0.0	0.0
16	Womens Bathroom	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	144.0	1	T 34 R F 2 (MAG)	F42EE	72	0.1	NONE	1000	72.0	72.0	0.0	$10.30	$0.00	$0.00	0.0	0.0
71	Girls Bathroom	6	I 60	I60/1	60	0.4	SW	2000	720.0	6	I 60	I60/1	60	0.4	NONE	1000	360.0	360.0	0.0	$51.51	$0.00	$0.00	0.0	0.0
71	Janitor Closet	1	I 60	I60/1	60	0.1	SW	1000	60.0	1	I 60	I60/1	60	0.1	C-OCC	500	30.0	30.0	0.0	$4.29	$202.50	$35.00	47.2	39.0
71	Stairway	6	I 60	I60/1	60	0.4	SW	3200	1,152.0	6	I 60	I60/1	60	0.4	NONE	3200	1,152.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
16	108	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	107	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	110	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	109	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	112	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
16	111	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
35	114	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2912	1,572.5	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	1456	786.2	786.2	0.0	$112.50	$202.50	$35.00	1.8	1.5
16	113	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516.0	12	T 34 R F 2 (MAG)	F42EE	72	0.9	C-OCC	1456	1,258.0	1,258.0	0.0	$180.00	$202.50	$35.00	1.1	0.9
18	Boys Bathroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2000	448.0	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	NONE	1000	224.0	224.0	0.0	$32.05	$0.00	$0.00	0.0	0.0
18	Library	27	T 32 R F 4 (ELE)	F44ILL	112	3.0	SW	2912	8,805.9	27	T 32 R F 4 (ELE)	F44ILL	112	3.0	C-OCC	1456	4,402.9	4,402.9	0.0	$630.01	$202.50	$35.00	0.3	0.3
18	Library Office	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	3000	1,344.0	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1500	672.0	672.0	0.0	$96.16	$202.50	$35.00	2.1	1.7
16	318	6	T 34 R F 2 (MAG)	F42EE	72	0.4	SW	2912	1,258.0	6	T 34 R F 2 (MAG)	F42EE	72	0.4	C-OCC	1456	629.0	629.0	0.0	$90.00	$202.50	$35.00	2.2	1.9
35	309	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2912	786.2	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	1456	393.1	393.1	0.0	$56.25	$202.50	$35.00	3.6	3.0
35	311 - Computer Lab	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2912	3,931.2	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	1456	1,965.6	1,965.6	0.0	$281.26	$202.50	$35.00	0.7	0.6
16	308	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2912	209.7	1	T 34 R F 2 (MAG)	F42EE	72	0.1	C-OCC	1456	104.8	104.8	0.0	$15.00	$202.50	$35.00	13.5	11.2
35	317	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2912	3,931.2	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	1456	1,965.6	1,965.6	0.0	$281.26	$202.50	$35.00	0.7	0.6
35	312	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2912	1,572.5	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	1456	786.2	786.2	0.0	$112.50	$202.50	$35.00	1.8	1.5
35	Office PC Room	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3000	270.0	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1500	135.0	135.0	0.0	$19.32	$202.50	$35.00	10.5	8.7
16	Outdoor Storage Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288.0	4	T 34 R F 2 (MAG)	F42EE	72	0.3	C-OCC	250	72.0	216.0	0.0	$30.91	$202.50	$35.00	6.6	5.4
35	317 Storage	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	1000	270.0	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	250	67.5	202.5	0.0	$28.98	$202.50	$35.00	7.0	5.8
16	315 Storage	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288.0	4	T 34 R F 2 (MAG)	F42EE	72	0.3	C-OCC	250	72.0	216.0	0.0	$30.91	$202.50	$35.00	6.6	5.4
18	Main Office	11	T 32 R F 4 (ELE)	F44ILL	112	1.2	SW	3000	3,696.0	11	T 32 R F 4 (ELE)	F44ILL	112	1.2	C-OCC	1500	1,848.0	1,848.0	0.0	$264.43	$202.50	$35.00	0.8	0.6
16	Server Room	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	1000	72.0	1	T 34 R F 2 (MAG)	F42EE	72	0.1	C-OCC	250	18.0	54.0	0.0	$7.73	$202.50	$35.00	26.2	21.7
71	Main Office Bathroom	3	I 60	I60/1	60	0.2	SW	2000	360.0	3	I 60	I60/1	60	0.2	NONE	1000	180.0	180.0	0.0	$25.76	$0.00	$0.00	0.0	0.0
141LED	Exterior	29	HPS 200	HPS200/1	250	7.3	SW	4368	31,668.0	29	HPS 200	HPS200/1	250	7.3	C-OCC	4368	31,668.0	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
236	Exterior	8	R 75 C Q 1	h75/1	75	0.6	SW	4368	2,620.8	8	R 75 C Q 1	h75/1	75	0.6	C-OCC	4368	2,620.8	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
146	Exterior	1	High Bay MH 400	MH400/1	458	0.5	SW	4368	2,000.5	1	High Bay MH 400	MH400/1	458	0.5	C-OCC	4368	2,000.5	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
143	Exterior	10	HPS 100 POLE	HPS100/1	138	1.4	SW	4368	6,027.8	10	HPS 100 POLE	HPS100/1	138	1.4	C-OCC	4368	6,027.8	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
	Total	**614**				**57.8**			**172,090**	**614**				**58**				**121,060**	**51,031**	**0**	**7,302**	**$11,948**	**2,065**		

Demand Savings		**0.0**	**$0**		
kWh Savings		**51,031**	**$7,302**		
Total Savings			**$7,302**	**1.6**	**1.4**

Energy Audit of Penns Grove School District

CHA Project No.24510

ECM-3 Lighting Replacements with Occupancy Sensors

Cost of Electricity: **$0.143 $/kWh**

$6.01 $/kW

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	NYSERDA Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number//Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	($/kWh) * Annual kWh Saved	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
191	Boiler Room	2	S 60 C F 2 (ELE) 8'	F82EE	123	0.2	SW	1000	246	2	S 60 C F 2 (ELE) 8'	F82EE	123	0.2	C-OCC	1,000	246	-	0.0	$ -	$ 202.50	$ 35		
21	Boiler Room	1	1B 34 C F 4 (MAG)	F44EE	144	0.1	SW	1000	144	1	1B 28 C F 4	F44SSILL	96	0.1	C-OCC	1,000	96	48	0.0	$ 10.33	$ 344.25	$ 35	33.3	29.9
18	Boiler Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1000	224	2	0	F44SSILL	96	0.2	C-OCC	1,000	192	32	0.0	$ 6.89	$ 415.00	$ 55	60.3	52.3
71	Boiler Room	1	I 60	I60/1	60	0.1	SW	1000	60	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	1,000	27	33	0.0	$ 7.10	$ 209.25	$ 35	29.5	24.5
47	Boys Bathroom	3	1B 34 C F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	1B 28 C F 2	F42SSILL	48	0.1	NONE	1,000	144	288	0.1	$ 46.40	$ 384.75	$ -	8.3	8.3
16	213	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	214	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	211	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	Hallway (2nd Floor)	24	T 34 R F 2 (MAG)	F42EE	72	1.7	SW	2280	3,940	24	T 28 R F 2	F42SSILL	48	1.2	NONE	2,280	2,627	1,313	0.6	$ 229.47	$ 2,754.00	$ 240	12.0	11.0
16	212	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	209	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	210	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	207	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	208	10	T 34 R F 2 (MAG)	F42EE	72	0.7	SW	2912	2,097	10	T 28 R F 2	F42SSILL	48	0.5	C-OCC	1,456	699	1,398	0.2	$ 217.32	$ 1,350.00	$ 135	6.2	5.6
71	Janitor Closet	1	I 60	I60/1	60	0.1	SW	1000	60	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	500	14	47	0.0	$ 9.03	$ 209.25	$ 35	23.2	19.3
47	Girls Bathroom	3	1B 34 C F 2 (MAG)	F42EE	72	0.2	SW	2000	432	3	1B 28 C F 2	F42SSILL	48	0.1	NONE	1,000	144	288	0.1	$ 46.40	$ 384.75	$ -	8.3	8.3
16	Faculty Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	5000	1,440	4	T 28 R F 2	F42SSILL	48	0.2	C-OCC	3,000	576	864	0.1	$ 130.55	$ 661.50	$ 75	5.1	4.5
71	Faculty Room	1	I 60	I60/1	60	0.1	SW	5000	300	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	3,000	81	219	0.0	$ 33.72	$ 209.25	$ 35	6.2	5.2
47	Faculty Room Bath Room	1	1B 34 C F 2 (MAG)	F42EE	72	0.1	SW	2000	144	1	1B 28 C F 2	F42SSILL	48	0.0	NONE	1,000	48	96	0.0	$ 15.47	$ 128.25	$ -	8.3	8.3
172-A	Faculty Room	3	W 20 W F 2 (MAG)	F22SS	56	0.2	SW	5000	840	3	W 17 W F 2	F22ILL	33	0.1	C-OCC	3,000	297	543	0.1	$ 82.68	$ 506.25	$ 35	6.1	5.7
35	Men/Womens Bathroom (2nd Floor)	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2000	180	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	NONE	1,000	90	90	0.0	$ 12.88	$ -	$ -	0.0	0.0
16	Stairway Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2912	839	4	T 28 R F 2	F42SSILL	48	0.2	NONE	1,456	280	559	0.1	$ 86.93	$ 459.00	$ 40	5.3	4.8
35	Handicapped Bathroom	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2000	180	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	NONE	1,000	90	90	0.0	$ 12.88	$ -	$ -	0.0	0.0
16	205	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	206	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	203	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	204	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	201	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	202	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
13	Stairway	4	S 32 P F 2 (ELE)	F42LL	60	0.2	SW	3200	768	4	0	F42SSILL	48	0.2	NONE	3,200	614	154	0.0	$ 25.44	$ 425.00	$ 40	16.7	15.1
174	Entryway	3	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOWN	F43EE	115	0.3	SW	2280	787	3	W 28 W F 3	F43SSILL	72	0.2	NONE	2,280	492	294	0.1	$ 51.39	$ 384.75	$ -	7.5	7.5
141	Gym	20	HPS 250	HPS250/1	295	5.9	SW	2912	17,181	20	HPS 250	HPS250/1	295	5.9	NONE	2,912	17,181	-	0.0	$ -	$ -	$ -		
174	Gym Office	1	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOWN	F43EE	115	0.1	SW	3000	345	1	W 28 W F 3	F43SSILL	72	0.1	C-OCC	1,500	108	237	0.0	$ 37.01	$ 330.75	$ 35	8.9	8.0
16	Gym Storage	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288	4	T 28 R F 2	F42SSILL	48	0.2	C-OCC	250	48	240	0.1	$ 41.27	$ 661.50	$ 75	16.0	14.2
174	Gym Boys Bathroom	2	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOWN	F43EE	115	0.2	SW	2000	460	2	W 28 W F 3	F43SSILL	72	0.1	NONE	1,000	144	316	0.1	$ 51.42	$ 256.50	$ -	5.0	5.0
174	Gym Girls Bathroom	2	W 34 W F 3 (MAG) BED LAMP 2 UP 1 DOWN	F43EE	115	0.2	SW	2000	460	2	W 28 W F 3	F43SSILL	72	0.1	NONE	1,000	144	316	0.1	$ 51.42	$ 256.50	$ -	5.0	5.0
16	100	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2912	839	4	T 28 R F 2	F42SSILL	48	0.2	C-OCC	1,456	280	559	0.1	$ 86.93	$ 661.50	$ 75	7.6	6.7
16	Nurse	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	3000	432	2	T 28 R F 2	F42SSILL	48	0.1	C-OCC	1,500	144	288	0.0	$ 44.67	$ 432.00	$ 55	9.7	8.4
71	Nurse	2	I 60	I60/1	60	0.1	SW	3000	360	2	CF 26	CFQ26/1-L	27	0.1	C-OCC	1,500	81	279	0.1	$ 44.68	$ 216.00	$ 35	4.8	4.1
16	101	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	104	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	104	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
35	Conference Room	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	1200	324	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	1,000	270	54	0.0	$ 7.73	$ 202.50	$ 35	26.2	21.7
16	Cafeteria	38	T 34 R F 2 (MAG)	F42EE	72	2.7	SW	1600	4,378	38	T 28 R F 2	F42SSILL	48	1.8	NONE	1,200	2,189	2,189	0.9	$ 378.99	$ 4,360.50	$ 380	11.5	10.5
16	Kitchen	8	T 34 R F 2 (MAG)	F42EE	72	0.6	SW	1600	922	8	T 28 R F 2	F42SSILL	48	0.4	NONE	1,200	461	461	0.2	$ 79.79	$ 918.00	$ 80	11.5	10.5
71	Kitchen Freezer	1	I 60	I60/1	60	0.1	SW	8760	526	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	-	-	526	0.0	$ 77.59	$ 209.25	$ 35	2.7	2.2
71	Back Kitchen Entryway	7	I 60	I60/1	60	0.4	SW	2280	958	7	CF 26	CFQ26/1-L	27	0.2	NONE	2,280	431	527	0.2	$ 92.03	$ 47.25	$ -	0.5	0.5
16	Handicapped Bathroom	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	144	1	T 28 R F 2	F42SSILL	48	0.0	NONE	1,000	48	96	0.0	$ 15.47	$ 114.75	$ 10	7.4	6.8
16	Womens Bathroom	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	144	1	T 28 R F 2	F42SSILL	48	0.0	NONE	1,000	48	96	0.0	$ 15.47	$ 114.75	$ 10	7.4	6.8
71	Girls Bathroom	6	I 60	I60/1	60	0.4	SW	2000	720	6	CF 26	CFQ26/1-L	27	0.2	NONE	1,000	162	558	0.2	$ 94.13	$ 40.50	$ -	0.4	0.4
71	Janitor Closet	1	I 60	I60/1	60	0.1	SW	1000	60	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	500	14	47	0.0	$ 9.03	$ 209.25	$ 35	23.2	19.3
71	Stairway	6	I 60	I60/1	60	0.4	SW	3200	1,152	6	CF 26	CFQ26/1-L	27	0.2	NONE	3,200	518	634	0.2	$ 104.95	$ 40.50	$ -	0.4	0.4
16	108	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	107	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	110	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	109	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	112	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
16	111	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
35	114	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2912	1,572	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	1,456	786	786	0.0	$ 112.50	$ 202.50	$ 35	1.8	1.5
16	113	12	T 34 R F 2 (MAG)	F42EE	72	0.9	SW	2912	2,516	12	T 28 R F 2	F42SSILL	48	0.6	C-OCC	1,456	839	1,677	0.3	$ 260.78	$ 1,579.50	$ 155	6.1	5.5
18	Boys Bathroom	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	2000	448	2	0	F44SSILL	96	0.2	NONE	1,000	192	256	0.0	$ 38.94	$ 212.50	$ 20	5.5	4.9
18	Library	27	T 32 R F 4 (ELE)	F44ILL	112	3.0	SW	2912	8,806	27	0	F44SSILL	96	2.6	C-OCC	1,456	3,774	5,032	0.4	$ 751.18	$ 3,071.25	$ 305	4.1	3.7
18	Library Office	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	3000	1,344	4	0	F44SSILL	96	0.4	C-OCC	1,500	576	768	0.1	$ 114.51	$ 627.50	$ 75	5.5	4.8
16	318	6	T 34 R F 2 (MAG)	F42EE	72	0.4	SW	2912	1,258	6	T 28 R F 2	F42SSILL	48	0.3	C-OCC	1,456	419	839	0.1	$ 130.39	$ 891.00	$ 95	6.8	6.1
35	309	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2912	786	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	1,456	393	393	0.0	$ 56.25	$ 202.50	$ 35	3.6	3.0
35	311 - Computer Lab	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2912	3,931	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	1,456	1,966	1,966	0.0	$ 281.26	$ 202.50	$ 35	0.7	0.6
16	308	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2912	210	1	T 28 R F 2	F42SSILL	48	0.0	C-OCC	1,456	70	140	0.0	$ 21.73	$ 317.25	$ 45	14.6	12.5
35	317	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2912	3,931	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	1,456	1,966	1,966	0.0	$ 281.26	$ 202.50	$ 35	0.7	0.6
35	312	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2912	1,572	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	1,456	786	786	0.0	$ 112.50	$ 202.50	$ 35	1.8	1.5
35	Office PC Room	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3000	270	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1,500	135	135	0.0	$ 19.32	$ 202.50	$ 35	10.5	8.7
16	Outdoor Storage Room	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288	4	T 28 R F 2	F42SSILL	48	0.2	C-OCC	250	48	240	0.1	$ 41.27	$ 661.50	$ 75	16.0	14.2
35	317 Storage	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	1000	270	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	250	68	203	0.0	$ 28.98	$ 202.50	$ 35	7.0	5.8
16	315 Storage	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	1000	288	4	T 28 R F 2	F42SSILL	48	0.2	C-OCC	250	48	240	0.1	$ 41.27	$ 661.50	$ 75	16.0	14.2
18	Main Office	11	T 32 R F 4 (ELE)	F44ILL	112	1.2	SW	3000	3,696	11	0	F44SSILL	96	1.1	C-OCC	1,500	1,584	2,112	0.2	$ 314.90	$ 1,371.25	$ 145	4.4	3.9
16	Server Room	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	1000	72	1	T 28 R F 2	F42SSILL	48	0.0	C-OCC	250	12	60	0.0	$ 10.32	$ 317.25	$ 45	30.8	26.4
71	Main Office Bathroom	3	I 60	I60/1	60	0.2	SW	2000	360	3	CF 26	CFQ26/1-L	27	0.1	NONE	1,000	81	279	0.1	$ 47.06	$ 20.25	$ -	0.4	0.4
141LED	Exterior	29	HPS 200	HPS200/1	250	7.3	SW	4368	31,668	29	FXLED78	FXLED78/1	78	2.3	C-OCC	4,368	9,880	21,788	5.0	$ 3,477.42	$ 20,662.00	$ 325	5.9	5.8
236	Exterior	8	R 75 C Q 1	h75/1	75	0.6	SW	4368	2,621	8	CF 26	CFQ26/1-L	27	0.2	C-OCC	4,368	943	1,677	0.4	$ 267.71	$ 256.50	$ 35	1.0	0.8
146	Exterior	1	High Bay MH 400	MH400/1	458	0.5	SW	4368	2,001	1	P 54 C F 4	FC20	20	0.0	C-OCC	4,368	87	1,913	0.4	$ 305.35	$ 202.50	$ 135	0.7	0.2
143	Exterior	10	HPS 100 POLE	HPS100/1	138	1.4	SW	4368	6,028	10	HPS 100 POLE	HPS100/1	138	1.4	C-OCC	4,368	6,028	-	0.0	$ -	$ 202.50	$ 35		
S	**Total**	**614**				**57.8**			**172,090**	**614**				**40.2**				**78,158**	**17.6**	**14,710**	**85,321**	**$6,875**		
S																		**Demand Savings**		**17.6**	**$1,269**			
S																		**kWh Savings**		**93,932**	**$13,441**			
S																		**Total Savings**			**$14,710**		**5.8**	**5.3**

APPENDIX D

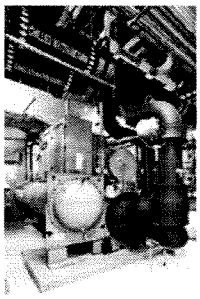
New Jersey Pay For Performance Incentive Program

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.

CONTACT US

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.

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

New Jersey SmartStart BUILDINGS®

BPU

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 governements 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)	55,515
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilites (BPU)

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

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$40,128	$20,523
Existing Usage (from utility)	280,440	19,167
Proposed Savings	140,052	-1,557
Existing Total MMBtus	2,874	
Proposed Savings MMBtus	322	
% Energy Reduction	**11.2%**	
Proposed Annual Savings	$16,500	

	Min (Savings = 15%)		Increase (Savings > 15%)		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	$0.00	$0.00
Incentive #3	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.00	$0.00

Total Recommended Project Savings	Incentives $		
11.2%	Elec	Gas	Total
Incentive #1	$0	$0	$5,000
Incentive #2	$0	$0	$0
Incentive #3	$0	$0	$0
Total All Incentives	**$0**	**$0**	**$5,000**

Total Project Cost	$117,485

		Allowable Incentive
% Incentives #1 of Utility Cost*	8.2%	$5,000
% Incentives #2 of Project Cost**	0.0%	$0
% Incentives #3 of Project Cost**	0.0%	$0
Total Eligible Incentives***	**$5,000**	
Project Cost w/ Incentives	$112,485	

Project Payback (years)	
w/o Incentives	w/ Incentives
7.1	6.8

* 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

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

- PROGRAMS
  - NJ SMARTSTART BUILDINGS
  - 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
  - EDA PROGRAMS
  - TEACH
  - ARRA
- TECHNOLOGIES
- TOOLS AND RESOURCES
- PROGRAM UPDATES
- CONTACT US

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.

APPENDIX F

Solar Photovoltaic Analysis

Penns Grove-Carneys Point Regional School District
Paul W. Carleton Elementary School

Cost of Electricity	$0.143	/kWh
Electricity Usage	280,440	kWh/yr
System Unit Cost	$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$400,000	**100.0**	**131,374**	**0**	**$18,786**	**0**	**$18,786**	**$0**	**$7,882**	**21.3**	**15.0**

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

Area Output*
2,078 m2
22,368 ft2

Perimeter Output*
214 m
701 ft

Available Roof Space for PV:
(Area Output - 10 ft x Perimeter) x 85%
13,057 ft2

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

8 watt/ft2
104,452 DC watts
100 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 08069 Enter into PV Watts
DC/AC Derate Factor 0.83 Enter info PV Watts

PV Watts Output
131,374 annual kWh calculated in PV Watts program

% Offset Calc

Usage	280,440	(from utilities)
PV Generation	131,374	(generated using PV Watts)
% offset	47%	

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

PVWatts * * * * *

AC Energy & Cost Savings

* * * * *

Cautions for Interpreting the Results

Paul W. Carleton Elementary School - Penns Grove Board of Education

Station Identification

Cell ID:	0266373
State:	New Jersey
Latitude:	39.8 ° N
Longitude:	75.3 ° W

PV System Specifications

DC Rating:	100.0 kW
DC to AC Derate Factor:	0.830
AC Rating:	83.0 kW
Array Type:	Fixed Tilt
Array Tilt:	20.0 °
Array Azimuth:	180.0 °

Energy Specifications

Cost of Electricity:	14.3 ¢/kWh

Results

Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	2.80	7252	1037.04
2	3.53	8346	1193.48
3	4.96	12498	1787.21
4	5.39	12798	1830.11
5	5.96	14227	2034.46
6	6.25	14006	2002.86
7	5.95	13646	1951.38
8	5.75	13145	1879.74
9	5.17	11710	1674.53
10	4.19	10186	1456.60
11	2.96	7156	1023.31
12	2.55	6403	915.63
Year	4.63	131374	18786.48

Output Hourly Performance Data

(Gridded data is monthly, hourly output not available.)

Output Results as Text

Saving Text from a Browser

Run PVWATTS v.2 for another location

Run PVWATTS v.1

Please send questions and comments to Webmaster

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APPENDIX G

EPA Portfolio Manager

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Paul W. Carleton Elementary School

Building ID: 3242176
For 12-month Period Ending: June 30, 2012[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: August 30, 2012

Facility
Paul W. Carleton Elementary School
251 Maple Avenue
Penns Grove, NJ 08061

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1951
Gross Floor Area (ft²): 55,515

Energy Performance Rating[2] (1-100) 53

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	956,861
Natural Gas (kBtu)[4]	1,675,805
Total Energy (kBtu)	2,632,666
Energy Intensity[4]	
Site (kBtu/ft²/yr)	47
Source (kBtu/ft²/yr)	89
Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	225
Electric Distribution Utility	
Atlantic City Electric Co [Pepco Holdings Inc]	
National Median Comparison	
National Median Site EUI	49
National Median Source EUI	92
% Difference from National Median Source EUI	-3%
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.

Certifying Professional
N/A

Meets Industry Standards[5] **for Indoor Environmental Conditions:**

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

Notes:
1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. 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	☑
Building Name	Paul W. Carleton Elementary School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	251 Maple Avenue, Penns Grove, NJ 08061	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of a hospital, k-12 school, hotel and senior care facility) nor can they be submitted as representing only a portion of a building.		☐
Paul W Carleton Elementary School (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	55,515 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.		☐
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.		☐
Number of PCs	20	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	0	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
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".		☐
Percent Cooled	0 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	10(Optional)	Is this school in operation for at least 8 months of the year?		☐

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'.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Atlantic City Electric Co [Pepco Holdings Inc]

Fuel Type: Electricity

Meter: Electric (0142 0559 9997) (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
06/01/2012	06/30/2012	26,320.00
05/01/2012	05/31/2012	23,440.00
04/01/2012	04/30/2012	23,680.00
03/01/2012	03/31/2012	24,120.00
02/01/2012	02/29/2012	24,560.00
01/01/2012	01/31/2012	24,640.00
12/01/2011	12/31/2011	24,640.00
11/01/2011	11/30/2011	22,560.00
10/01/2011	10/31/2011	26,320.00
09/01/2011	09/30/2011	15,760.00
08/01/2011	08/31/2011	20,880.00
07/01/2011	07/31/2011	23,520.00
Electric (0142 0559 9997) Consumption (kWh (thousand Watt-hours))		**280,440.00**
Electric (0142 0559 9997) Consumption (kBtu (thousand Btu))		**956,861.28**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**956,861.28**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

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

Start Date	End Date	Energy Use (therms)
06/01/2012	06/30/2012	56.00
05/01/2012	05/31/2012	110.92
04/01/2012	04/30/2012	0.00
03/01/2012	03/31/2012	4,707.38
02/01/2012	02/29/2012	4,662.58
01/01/2012	01/31/2012	4,226.07
12/01/2011	12/31/2011	2,120.68
11/01/2011	11/30/2011	765.58
10/01/2011	10/31/2011	39.25
09/01/2011	09/30/2011	22.90

08/01/2011	08/31/2011	19.70
07/01/2011	07/31/2011	26.99
Gas Meter Consumption (therms)		**16,758.05**
Gas Meter Consumption (kBtu (thousand Btu))		**1,675,805.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**1,675,805.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

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

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

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same 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
Paul W. Carleton Elementary School
251 Maple Avenue
Penns Grove, NJ 08061

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Paul W. Carleton Elementary School	
Gross Floor Area Excluding Parking: (ft²)	55,515
Year Built	1951
For 12-month Evaluation Period Ending Date:	June 30, 2012

Facility Space Use Summary

Paul W Carleton Elementary School	
Space Type	K-12 School
Gross Floor Area (ft²)	55,515
Open Weekends?	No
Number of PCs	20
Number of walk-in refrigeration/freezer units	0
Presence of cooking facilities	Yes
Percent Cooled	0
Percent Heated	100
Months °	10
High School?	No
School District °	Penns grove-Carneys Point

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 06/30/2012)	**Baseline** (Ending Date 06/30/2012)	**Rating of 75**	**Target**	**National Median**
Energy Performance Rating	53	53	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	47	47	38	N/A	49
Source (kBtu/ft²)	89	89	72	N/A	92
Energy Cost					
$/year	$ 57,937.81	$ 57,937.81	$ 46,770.55	N/A	$ 59,819.38
$/ft²/year	$ 1.04	$ 1.04	$ 0.84	N/A	$ 1.07
Greenhouse Gas Emissions					
$MtCO_2e$/year	225	225	182	N/A	232
$kgCO_2e$/ft²/year	4	4	3	N/A	4

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.