PENNS GROVE – CARNEYS POINT REGIONAL SCHOOL DISTRICT
PENNS GROVE HIGH 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
Penns Grove High School	334 Harding Highway Carneys Point, New Jersey	166,000	Original: 1971

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 $33,100 for the recommended ECMs may be realized with a payback of 7.0 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 Domestic Hot Water Heaters	21,000	5,200	4.0	900	4.0	X
2	Replace Exterior Door Seals & Sweeps	9,000	400	>20	0	>20	
3	Add Demand Control Ventilation to the Gymnasium and Cafeteria	17,000	1,500	11.3	0	11.3	X
4	Program Night Setback on Boiler Controls	12,000	3,000	4.0	0	4.0	X
5	Replace Electric Booster Heater with Natural Gas	16,000	1,800	8.9	500	8.6	X
6	Install a High Efficiency Motor & VSD on HV Fan Motor in Cafeteria	5,000	1,100	4.5	100	4.5	X
7	Lighting Replacements/ Upgrades	174,000	14,000	12.4	11,100	11.6	
8	Lighting Controls (Occupancy Sensors)	17,400	10,100	1.7	3,000	1.4	
9	Lighting Replacements/ Upgrades & Controls (Occupancy Sensors)	192,000	20,500	9.4	14,100	8.7	X
10	Water Conservation (Low Flow Fixtures)	39,000	2,000	19.5	0	19.5	

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 Penns Grove High School located in Carneys Point, NJ, is a 166,000 square foot one story stand-alone building with masonry construction. It is a building like structure containing classrooms, reception/office areas, a kitchen, high bay cafeteria, high bay auditorium, high bay gymnasium, high bay library, several high bay technology classrooms and restrooms. The building was constructed in 1971. Occupancy includes approximately 665 students and 90 faculty members. The building operates Monday through Friday from 7:30 am to approximately 3:30 pm and until around 11:00 pm for the custodians. There is also some reduced occupancy on weekends, and occupancy levels are reduced in summer months between each school year.

3.0 EXISTING CONDITIONS

3.1 Building - General

Originally built in 1971, the Penns Grove High School is a 166,000 square foot building containing classrooms, reception/office areas, a kitchen, high bay cafeteria, high bay auditorium, high bay gymnasium, high bay library, several high bay technology classrooms and restrooms. The main entrance is a store front glass door with metal frame that opens into the front lobby area near the main office on the north side of the building.

The Penns Grove High School building has approximately 665 students and 90 faculty and staff; the building was empty during our field inspection besides for contractors, custodians and a few staff members, but is typically used year-round with a summer recess. The building can be assumed to be fully occupied until 3:30 during the week for students and faculty and around 11:00 pm for custodians. The hours of operation are:

- Monday thru Friday 7:30 am to 3:30 pm.
- Monday thru Friday until 11:00 pm (custodians)

The building is constructed of masonry materials; finished exteriors are a red 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. Windows are double pane with low-emittance set-in metal frames. The main entrance doors are part glass, and part metal panel with metal frames. The building has exposed walls facing the north, east, south and west directions of varying heights (refer to photo above). The majority of the one story building is 15’ in height, with a few high bay areas. 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	992,250	kWh/yr
Annual Cost	137,180	$
Blended Rate	0.138	$/kWh
Consumption Rate	0.112	$/kWh
Demand Rate	6.00	$/kW
Peak Demand	307.5	kW
Min. Demand	240.0	kW
Avg. Demand	290.0	kW
Natural Gas		
Annual Usage	62,862	Therms/yr
Annual Cost	62,625	$
Rate	1.00	$/Therms
Water		
Annual Usage	1,676,000	gallons/yr
Annual Cost	6,673	$
Rate	5.182	$/gallon

Electrical usage was generally higher in the summer months when air conditioning equipment was operational. 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

The systems and equipment described below serve the Penns Grove High School building. Specifics on the mechanical equipment can be found within the equipment inventory located in Appendix B.

3.3.1 Heating Hot Water System

The main heating of the Penns Grove High School is produced by 4 Aerco gas-fired hot water condensing boilers installed in 2007 which are 3,000 MBH each. Heating hot water was distributed through the building by a 30 HP hot water pump running on a variable frequency drive (VFD). The classrooms typically each contain a Nesbitt HW coil unit ventilator (UV) with a pneumatic thermostat. The gymnasium, cafeteria and auditorium have 4,000 CFM heating and ventilation (HV) units which receive heat through hot water coils within the units. There are a total of 6 Nesbitt HV units in the school however the auditorium unit is going to be replaced with a packaged rooftop unit. Some offices in the building also have heating and cooling supplied by a FLA water-cooled heat pump.

3.3.2 Air Conditioning

Many of the classrooms contain 12,000 BTU window A/C units which are manually controlled by the teachers. These units appeared to be in good condition.. The main offices contain (4) self –contained direct expansion (DX) fan coil units. There are also two 9,000 BTU water-cooled Nesbitt fan coil units in the main offices. During our site inspection, a new packaged roof mounted cooling unit was being installed to serve the Auditorium, which was previously served by a large indoor air handling unit. This unit is scheduled to be removed as part of the new installation. Also, several classrooms were being renovated and variable refrigerant volume (VRV) ductless split heat pumps were being installed. These units are highly energy efficient and will provide both heating and cooling to these spaces. Separate energy recovery ventilators were also being installed to provide ventilation.

3.3.3 Ventilation

The building is primarily heated and ventilated using unit ventilators. There are four (4) older Nesbitt air handling units located in the gymnasium that provide heating and ventilation. Exhaust is removed by separate roof mounted fans. Similarly, the cafeteria is served by one large Nesbitt air handling unit, that also provides heating and ventilation. The kitchen is provide with a recirculation type hood and roof mounted exhaust fan. Make-up air is transferred from the café to the kitchen.

Individual roof mounted exhaust fans ventilate toilet rooms and custodian closets. Classroom pressure relief is accomplished using louvered doors or ducted transfer grilles to central corridor exhaust fans and relief air hoods.

3.4 Control Systems

The Aerco boilers have their own stand-alone DDC system installed which enables hot water reset based on outdoor air temperature, rotates lead and lag boilers, enables pump operation, adjusts fire rate modulation and had the capability to enable nighttime setback on the hot water supply temperature, but this feature did not appear to be set at the time of visit. The remainder of the high school ran on a hybrid pneumatic control system tied into the DDC boiler controls with compressed air supplied by a duplex air compressor running on (2) 1 horsepower motors.

3.5 Lighting/Electrical Systems

The facility primarily utilizes fixtures with T-8 32 watt lamps with electronic ballasts; compact fluorescent lamps and older style incandescent lamps are also used in select areas. The gymnasium cafeteria, and shop areas currently have new T-8 lighting purchased to replace the high pressure sodium lighting, which ranges from 250 to 400 watts. 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

The school has two, 70 gallon State natural gas fired domestic hot water heaters located in the mechanical room however, only one unit can be used due to inadequately sized flue venting. The school has future plans to produce hot water using their new condensing boilers and eliminate these water heaters. The mechanical room also contains one Bradford White 18 kW, 50 gallon electric domestic hot water heater. Finally, two janitor closets each contain one 40 gallon electric domestic hot water heater. Domestic hot water is used in lavatories, the kitchen, and custodial sinks. The majority of hot water piping appeared to be insulated. Domestic hot water temperature is maintained at 120°F.

3.6.2 Plumbing Fixtures

The building's lavatories, water closets, and urinals are old and have high flow plumbing fixtures. The existing water closets are 3.5 gallon per flush (gpf) and lavatories have meter-type faucets. There were roughly 39 faucets, 21 urinals and 31 toilets within the school.

4.0 ENERGY CONSERVATION MEASURES

4.1 ECM-1 Replace Electric Domestic Hot Water Heaters

Each janitor closet has a single 40 gallon electric domestic hot water heater. Additionally, the school has a third 50 gallon Bradford White electric domestic 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 tank type, high efficiency, condensing hot water heater. 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 837,600 kWh, -24,600 therms (since the system is changing from electric to natural gas) and $85,000.

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

ECM-1 Replace Domestic Water Heaters

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
19,000	69,800	0	-2,000	7,100	0	7,100	3.4	300	2.7	2.6

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

This measure is recommended.

4.2 ECM-2 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-2 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
9,000	0	0	400	400	0	400	(0.8)	0	>20	>20

* Incentive not applicable for this measure.

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This measure is not recommended.

4.3 ECM-3 Add Demand Control Ventilation to the Gymnasium and Cafeteria

Currently, the gymnasium and cafeteria are provided with ventilation air based on the space being occupied by the maximum design population. The areas are infrequently occupied to this level which results in over ventilation of the spaces. By adding carbon dioxide (CO_2) sensors, the outdoor air dampers can be controlled based on maintaining an acceptable level of CO_2 (typically 700 parts per million [ppm]), which is an indicator of good indoor air quality. As the occupancy levels increase, the outdoor air dampers will open and introduce more fresh air. When the space is not occupied, the dampers will close. This control strategy will reduce the energy that is currently being used to heat the excessive outdoor air.

The calculation is based on the original design ventilation rates (estimated at 20% of the total CFM) and an estimated reduction to 10% outdoor air flow. Run hours and building loads were estimated using bin weather data.

Electronic HVAC occupancy sensors have an expected life of 15 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 22,600 therms and $22,600.

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

ECM-3 Add Demand Control Ventilation to the Gymnasium and Cafeteria

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
43,000	0	0	1,500	1,500	0	1,500	(0.5)	0	>20	>20

* Incentive not applicable for this measure.

This measure is not recommended.

4.4 ECM-4 Program Night Setback on Boiler Controls

The building does not have a night setback control system utilized. Installing a nighttime setback to automatically reset the temperature to 60°F was assessed.

The annual natural gas usage for the facility was taking from the utility bills. According to the US Energy Information Agency (EIA), implementing a night setback system typically saves 5% of a facility's annual

heating cost. This savings is multiplied by the annual natural gas and converted to monetary savings using the unit cost of the fuel obtained from the utility analysis.

Night setback controls have an expected life of 18 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 55,000 therms of natural gas and $55,000.

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

ECM-4 Program Night Setback on Boiler Controls

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
12,000	0	0	3,000	3,000	0	3,000	3.6	0	4.0	4.0

This measure is recommended.

4.5 ECM-5 Replace Electric Booster Heater with Natural Gas

The facility uses a Hatco 45 kW electric hot water booster heater four hours per day for 180 days per year for sanitizing 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 340,200 kWh, -14,500 therms (as the unit will change from electric to natural gas) and $72,200.

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
7,000	45	22,700	-1,000	0	1,800	0	1,800	9.3	500	3.9	3.6

* 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 Install a High Efficiency Motor & VSD on HV Fan Motor in Cafeteria

The HV unit that serves the cafeteria has a 5 HP fan motor. Motors that operate fans continuously consume significant amounts of electrical energy. The HV operates at constant speed (air flow) even though the building load does not require all the air flow to maintain temperatures. By adding variable speed drives (VSDs) on high efficiency inverter duty motors to reduce the air flow by slowing the motors down will result in significant electrical energy savings. Space temperature and carbon dioxide (CO_2) sensors can also be used to reduce HV airflow when space conditions permit. Adding a VSD to the HV unit fan and controlling speed based on set point temperature and space temperature will save energy.

The calculation used a set point of 60°F and bin data to estimate annual heating hours. The assumption of this calculation is that the operating hours, motor horsepower, and capacity stay the same. The energy savings resulted from operating a higher efficiency motor and reduced power draw using a VSD.

VSDs have an expected life of 20 years, according to ASHRAE, and total energy savings over the life of the project are estimated at 131,200 kWh and $18,100.

ECM-6 Install a High Efficiency Motor & VSD on HV Fan Motor in Cafeteria

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	7,700	0	1,100	0	1,100	3.2	100	4.5	4.5

* Incentive potentially applicable for this measure.

This measure is not recommended.

4.7 ECM-7 Lighting Replacements/Upgrades

The Penns Grove High School utilizes mainly 32 watt T-8 fluorescent lamps with electronic ballasts. The gymnasium, shop areas, and cafeteria currently have high pressure sodium lighting ranging from 250 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 high bay 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 100,500 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 1,508,200 kWh and $210,300.

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

ECM-7 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
174,000	100,500	0	0	14,000	0	14,000	0.2	11,100	12.4	11.6

* 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-9.

4.8 ECM-8 Lighting Controls (Occupancy Sensors)

The current Penns Grove High School Building lighting is mostly controlled by manual switches. Lights are generally turned on in the morning and shut off at night. During school hours, 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 1,096,300kWh and $151,600.

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

ECM-8 Install Lighting Controls

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
17,400	73,100	0	0	10,100	0	10,100	7.7	3,000	1.7	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-9.

4.9 ECM-9 Lighting Replacements/Upgrades & Controls (Occupancy Sensors)

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-7 and ECM-8 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 2,371,600 kWh and $307,100.

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

ECM-9 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
192,000	158,100	38	0	20,500	0	20,500	0.6	14,100	9.4	8.7

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

This measure is recommended.

4.10 ECM-10 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 39 faucets, 21 urinals and 31 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 $2,000 annually.

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

ECM-10 Water Conservation (Low Flow Fixtures)

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
39,000	0	0	0	380	2,000	0	2,000	0.0	0	19.5	19.5

* 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 $		
9.1%	Elec	Gas	Total
Incentive #1	$0	$0	$8,300
Incentive #2	$0	$0	$0
Incentive #3	$0	$0	$0
Total All Incentives	**$0**	**$0**	**$8,300**

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.

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 High School is not eligible to receive incentives from the Direct Install Program due to the annual maximum demand exceeding the maximum peak electrical demand of 150 kW.

5.1.4 Energy Savings Improvement Plans (ESIP)

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

ESIP allows local units to use “energy savings obligations” to pay for the capital costs of energy improvements to their facilities. This can be done over a maximum term of 15 years. Energy savings obligations are not considered “new general obligation debt” of a local unit and do not count against debt limits or require voter approval. They may be issued as refunding bonds or leases. Savings generated from the installation of energy conservation measures pay the principal of and interest on the bonds; for that reason, the debt service created by the ESOs is not paid from the debt service fund, but is paid from the general fund.

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

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs.

6.0 ALTERNATIVE ENERGY SCREENING EVALUATION

6.1 Solar

6.1.1 Photovoltaic Rooftop Solar Power Generation

The 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 load justifies the use of 530 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 530 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
2,120,000	**530**	**692,280**	**0**	**96,087**	**0**	**96,087**	**0**	**41,777**	**22.1**	**15.4**

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 High School had a maximum electricity demand of 307 kW and a minimum of 240 kW. The monthly average over the observed 12 month period was 290 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 Penns Grove High School are as follows:

Energy Intensity	Penns Grove High School	National Average
EPA Score	71	50
Site (kBtu/sf/year)	52	64
Source (kBtu/sf/year)	102	125

The Penns Grove High 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 $33,100 for the recommended ECMs may be realized with a payback of 7.0 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 Domestic Hot Water Heaters	21,000	5,200	4.0	900	4.0	X
2	Replace Exterior Door Seals & Sweeps	9,000	400	>20	0	>20	
3	Add Demand Control Ventilation to the Gymnasium and Cafeteria	17,000	1,500	11.3	0	11.3	X
4	Program Night Setback on Boiler Controls	12,000	3,000	4.0	0	4.0	X
5	Replace Electric Booster Heater with Natural Gas	16,000	1,800	8.9	500	8.6	X
6	Install a High Efficiency Motor & VSD on HV Fan Motor in Cafeteria	5,000	1,100	4.5	100	4.5	X
7	Lighting Replacements/ Upgrades	174,000	14,000	12.4	11,100	11.6	
8	Lighting Controls (Occupancy Sensors)	17,400	10,100	1.7	3,000	1.4	
9	Lighting Replacements/ Upgrades & Controls (Occupancy Sensors)	192,000	20,500	9.4	14,100	8.7	X
10	Water Conservation (Low Flow Fixtures)	39,000	2,000	19.5	0	19.5	

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
0372 4399 9994	High School	Penns Grove High School, Penns Grove, NJ 08069	Electric
2 12 36 0038 0 8	Penns Grove High School	Harding Highway, Penns Grove, NJ	Gas
2 12 36 0037 0 9	Penns Grove High School/Greenhs	334 Harding Highway, Penns Grove, NJ	Gas
2 12 36 0036 0 0	Carneys Pt/Penns Grove High School	334 Harding Highway, Penns Grove, NJ	Gas

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

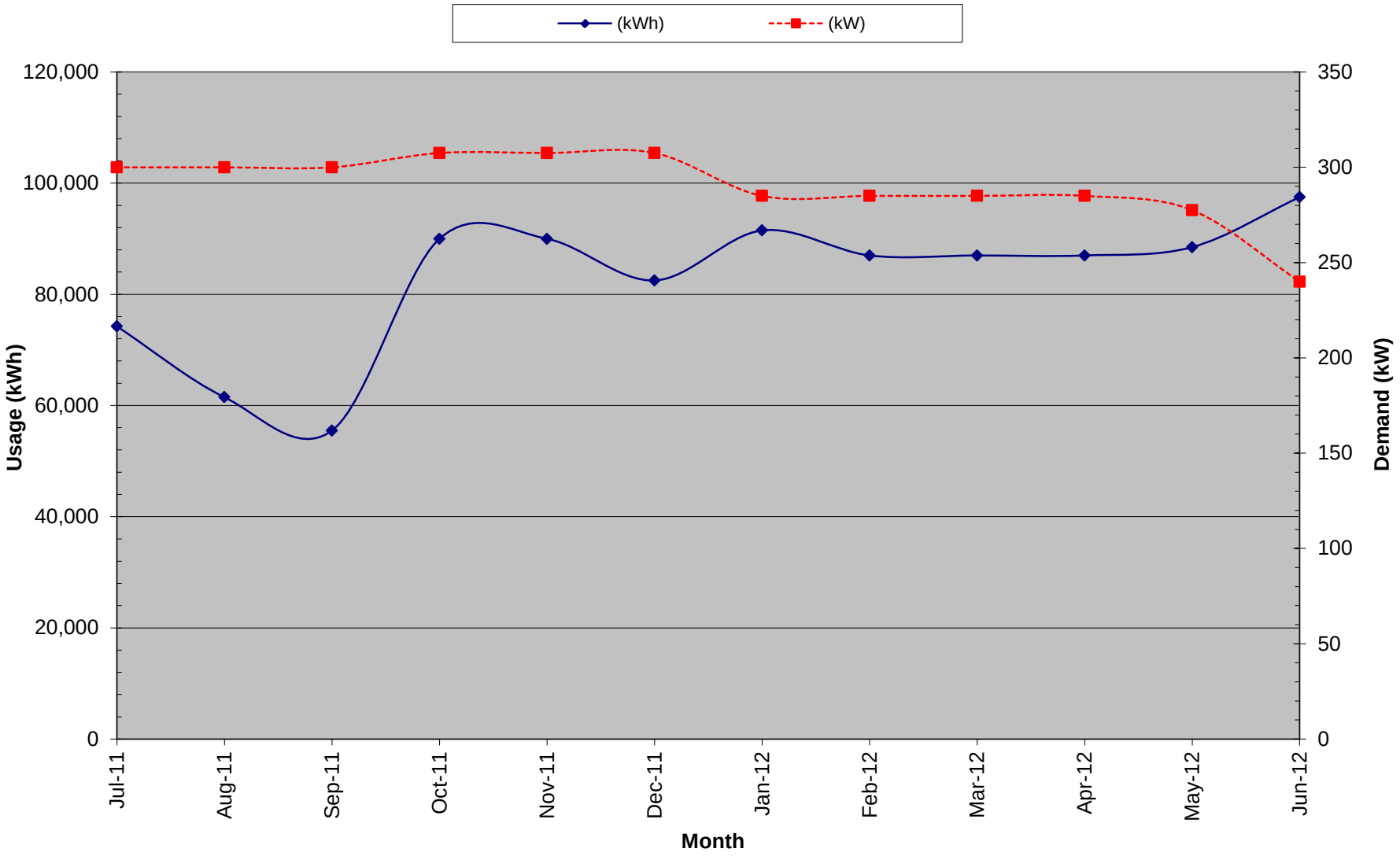
Electric Service
Delivery - ACE
Supplier - SJ Energy Co

For Service at: **High School**
Account No.: **0372 4399 9994**
Meter No.: **35592453**

			Charges			Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Total ($)	Delivery ($)	Supply ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
July-11	74,250	300.00	$10,596.61	$3,846.54	$6,750.07	$ 0.143	$ 0.120	$ 5.73
August-11	61,500	300.00	$9,277.16	$3,686.20	$5,590.96	$ 0.151	$ 0.120	$ 6.33
September-11	55,500	300.00	$8,442.39	$3,396.89	$5,045.50	$ 0.061	$ 0.029	$ 5.93
October-11	90,000	307.50	$13,233.51	$4,495.15	$8,738.36	$ 0.147	$ 0.125	$ 6.33
November-11	90,000	307.50	$12,319.49	$4,137.59	$8,181.90	$ 0.137	$ 0.117	$ 5.73
December-11	82,500	307.50	$11,618.30	$4,118.22	$7,500.08	$ 0.141	$ 0.118	$ 6.13
January-12	91,500	285.00	$12,705.51	$4,387.25	$8,318.26	$ 0.139	$ 0.118	$ 6.72
February-12	87,000	285.00	$11,737.50	$3,828.33	$7,909.17	$ 0.135	$ 0.117	$ 5.34
March-12	87,000	285.00	$12,695.12	$3,947.76	$8,747.36	$ 0.146	$ 0.127	$ 5.73
April-12	87,000	285.00	$11,976.36	$4,067.19	$7,909.17	$ 0.138	$ 0.118	$ 6.13
May-12	88,500	277.50	$12,046.73	$4,001.19	$8,045.54	$ 0.136	$ 0.118	$ 5.93
June-12	97,500	240.00	$10,530.82	$4,008.07	$6,522.75	$ 0.108	$ 0.093	$ 5.93
Total (All)	**992,250**	**307.50**	**$137,179.50**	**$47,920.38**	**$89,259.12**	**$ 0.138**	**$ 0.112**	**$ 6.00**

Notes
Designates an Interpolated value (data missing)

Electric Usage - High School - 0372 4399 9994



High School Utilities
High School Electric Graph

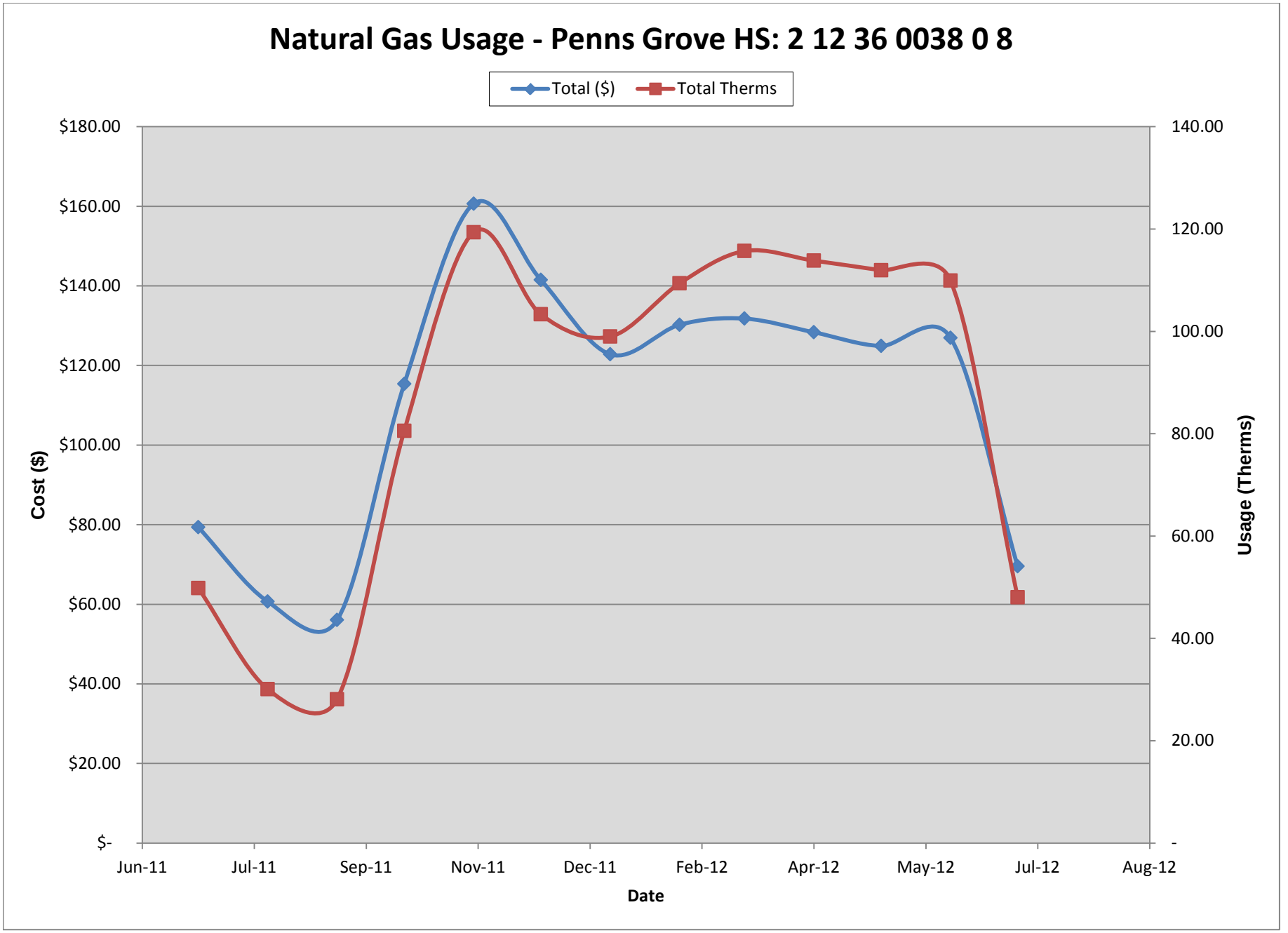
Penns Grove - Carneys Point Regional School District
Harding Highway, Penns Grove, NJ

Gas Service
Delivery -
Supplier -

For Service at: **Penns Grove High School** **(Kitchen?)**
Account No.: **2 12 36 0038 0 8**
Meter No.: **516838**

Month	Total ($)	Delivery ($)	Supply ($)	Total Therms	$/Therm
Jul-11	$ 79.34	$ 47.57	$ 31.77	49.82	$ 1.59
Aug-11	$ 60.68	$ 41.50	$ 19.18	30.07	$ 2.02
Sep-11	$ 56.04	$ 38.12	$ 17.92	28.11	$ 1.99
Oct-11	$ 115.38	$ 64.00	$ 51.38	80.57	$ 1.43
Nov-11	$ 160.62	$ 84.50	$ 76.12	119.36	$ 1.35
Dec-11	$ 141.51	$ 75.62	$ 65.89	103.32	$ 1.37
Jan-12	$ 122.81	$ 71.89	$ 50.92	98.98	$ 1.24
Feb-12	$ 130.23	$ 78.77	$ 51.46	109.39	$ 1.19
Mar-12	$ 131.78	$ 80.26	$ 51.52	115.70	$ 1.14
Apr-12	$ 128.34	$ 80.14	$ 48.20	113.82	$ 1.13
May-12	$ 124.89	$ 80.02	$ 44.87	111.94	$ 1.12
Jun-12	$ 126.96	$ 78.22	$ 48.74	109.92	$ 1.16
Jul-12	$ 69.53	$ 46.44	$ 23.09	48.02	$ 1.45
Total	**$ 1,448.11**	**$ 867.05**	**$ 581.06**	**1,119.02**	**$ 1.29**

Notes
Designates an interpolated value (no data given)


Natural Gas Usage - Penns Grove HS: 2 12 36 0038 0 8
Total ($)
Total Therms
$180.00
$160.00
$140.00
$120.00
$100.00
$80.00
$60.00
$40.00
$20.00
$-
140.00
120.00
100.00
80.00
60.00
40.00
20.00
-
Cost ($)
Usage (Therms)
Jun-11
Jul-11
Sep-11
Nov-11
Dec-11
Feb-12
Apr-12
May-12
Jul-12
Aug-12
Date

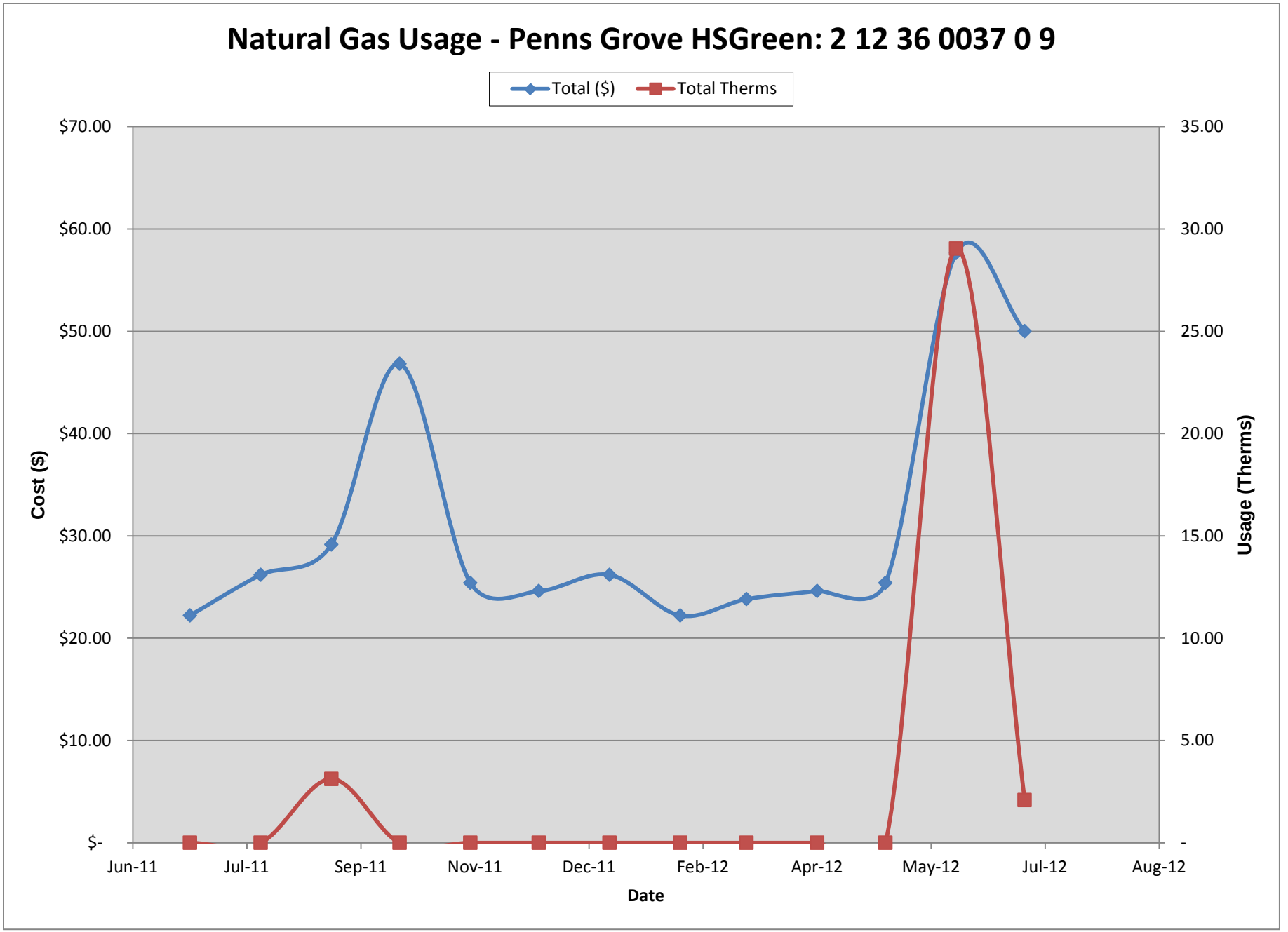
Penns Grove - Carneys Point Regional School District
334 Harding Highway, Penns Grove, NJ

Gas Service
Delivery -
Supplier -

For Service at: **Penns Grove High School/Greenhs** (Consessions?)
Account No.: **2 12 36 0037 0 9**
Meter No.: **0241000**

Month	Total ($)	Delivery ($)	Supply ($)	Total Therms	$/Therm
Jul-11	$ 22.22		$ 22.22	-	#DIV/0!
Aug-11	$ 26.19		$ 26.19	-	#DIV/0!
Sep-11	$ 29.14	$ 1.59	$ 27.55	3.12	$ 9.34
Oct-11	$ 46.82		$ 46.82	-	#DIV/0!
Nov-11	$ 25.40		$ 25.40	-	#DIV/0!
Dec-11	$ 24.60		$ 24.60	-	#DIV/0!
Jan-12	$ 26.19		$ 26.19	-	#DIV/0!
Feb-12	$ 22.22		$ 22.22	-	#DIV/0!
Mar-12	$ 23.81		$ 23.81	-	#DIV/0!
Apr-12	$ 24.61		$ 24.61	-	#DIV/0!
May-12	$ 25.40		$ 25.40	-	#DIV/0!
Jun-12	$ 57.64	$ 14.18	$ 43.46	29.04	$ 1.98
Jul-12	$ 50.01	$ 1.03	$ 48.98	2.09	$ 23.93
Total	**$ 404.25**	**$ 16.80**	**$ 387.45**	**34.25**	**$ 11.80**

Notes
Designates an interpolated value (no data given)


Natural Gas Usage - Penns Grove HSGreen: 2 12 36 0037 0 9
Total ($)
Total Therms
$70.00
$60.00
$50.00
$40.00
$30.00
$20.00
$10.00
$-
35.00
30.00
25.00
20.00
15.00
10.00
5.00
-
Cost ($)
Usage (Therms)
Jun-11
Jul-11
Sep-11
Nov-11
Dec-11
Feb-12
Apr-12
May-12
Jul-12
Aug-12
Date

Penns Grove - Carneys Point Regional School District
334 Harding Highway, Penns Grove, NJ

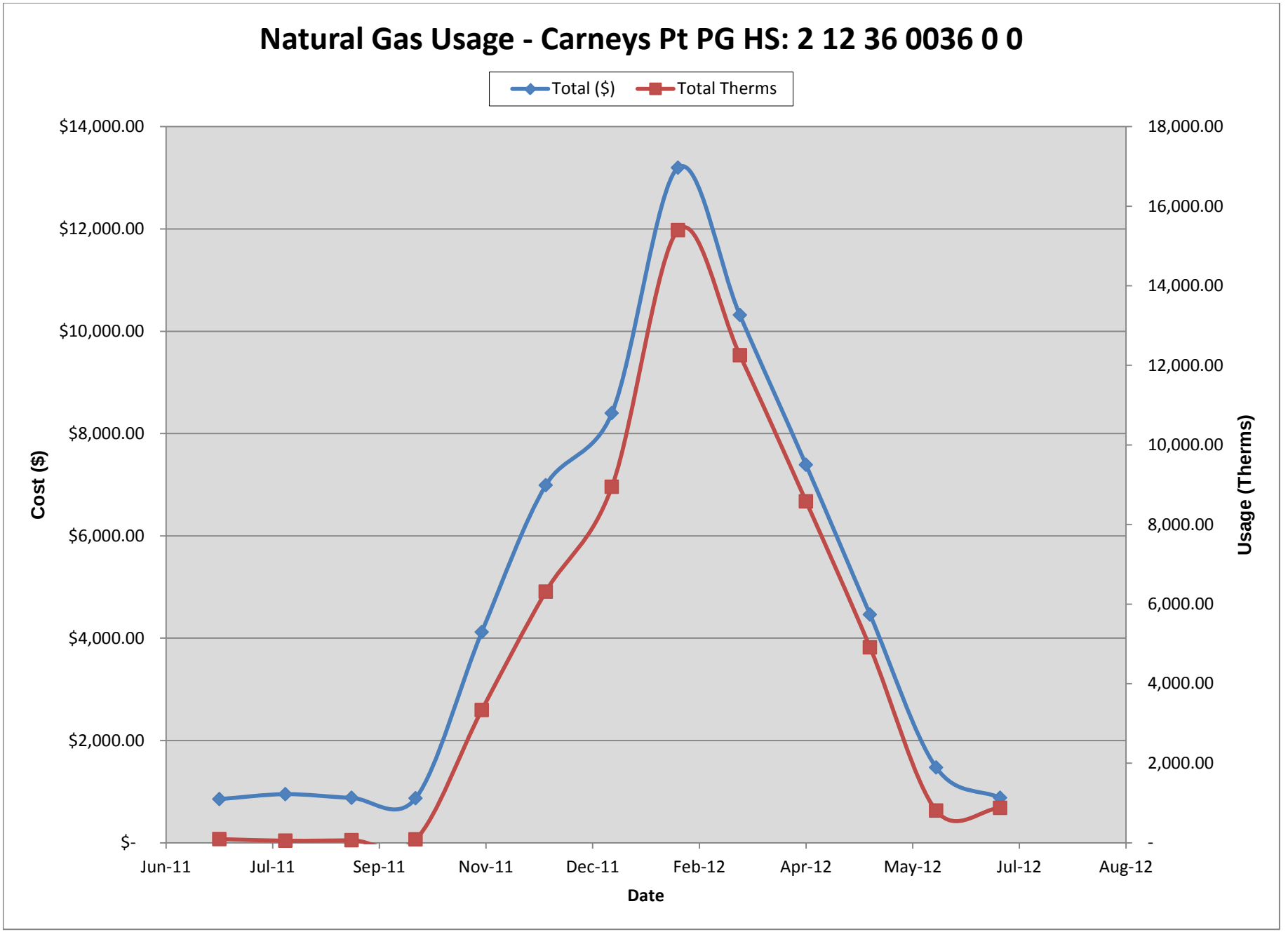
Gas Service
Delivery -
Supplier -

For Service at: **Carneys Pt/Penns Grove High School** (Main?)
Account No.: **2 12 36 0036 0 0**
Meter No.: **0337497**

Month	Total ($)	Delivery ($)	Supply ($)	Total Therms	$/Therm
Jul-11	$ 853.63	$ 794.06	$ 59.57	93.42	$ 9.14
Aug-11	$ 950.79	$ 917.73	$ 33.06	51.85	$ 18.34
Sep-11	$ 878.90	$ 839.07	$ 39.83	62.46	$ 14.07
Oct-11	$ 870.77	$ 818.07	$ 52.70	82.64	$ 10.54
Nov-11	$ 4,119.57	$ 1,993.54	$ 2,126.03	3,333.96	$ 1.24
Dec-11	$ 6,990.24	$ 2,965.20	$ 4,025.04	6,311.91	$ 1.11
Jan-12	$ 8,399.85	$ 3,795.64	$ 4,604.21	8,949.08	$ 0.94
Feb-12	$ 13,197.56	$ 5,953.68	$ 7,243.88	15,397.44	$ 0.86
Mar-12	$ 10,314.43	$ 4,858.89	$ 5,455.54	12,251.38	$ 0.84
Apr-12	$ 7,387.47	$ 3,675.85	$ 3,711.62	8,580.22	$ 0.88
May-12	$ 4,460.51	$ 2,492.81	$ 1,967.70	4,909.06	$ 0.91
Jun-12	$ 1,472.30	$ 1,113.61	$ 358.69	808.86	$ 1.82
Jul-12	$ 876.94	$ 826.74	$ 50.20	876.94	$ 1.00
Total	**$ 60,772.96**	**$ 31,044.89**	**$ 29,728.07**	**61,709**	**$ 0.98**

		Monthly	annual
	DHW	73	944
Notes	HHW Heating		60,766

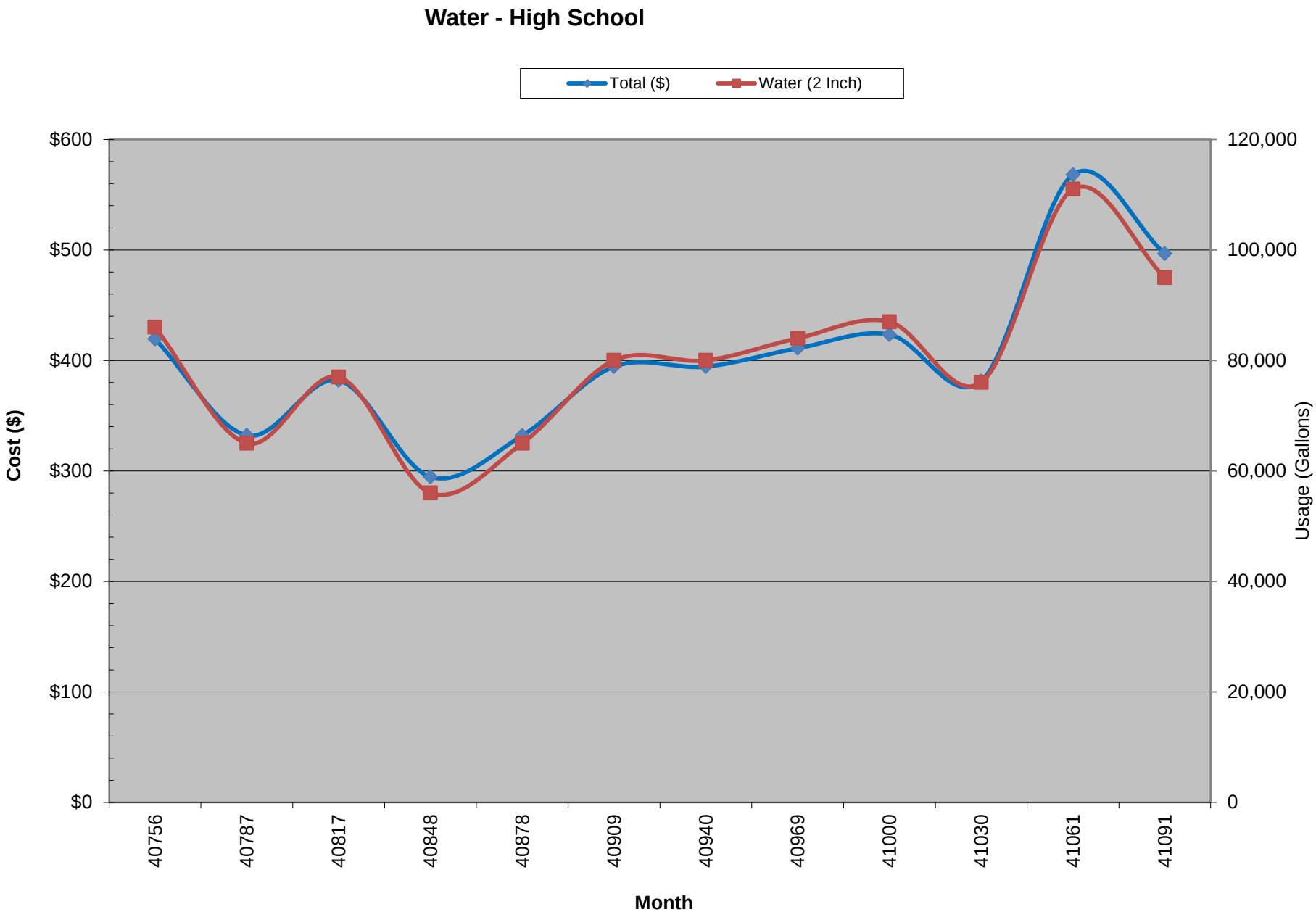
Designates an interpolated value (no data given)


Natural Gas Usage - Carneys Pt PG HS: 2 12 36 0036 0 0
Total ($)
Total Therms
$14,000.00
$12,000.00
$10,000.00
$8,000.00
$6,000.00
$4,000.00
$2,000.00
$-
Cost ($)
18,000.00
16,000.00
14,000.00
12,000.00
10,000.00
8,000.00
6,000.00
4,000.00
2,000.00
-
Usage (Therms)
Jun-11
Jul-11
Sep-11
Nov-11
Dec-11
Feb-12
Apr-12
May-12
Jul-12
Aug-12
Date

Penns Grove Board of Education
144 Field Street, Penns Grove, NJ 08069

For Service at: **High School**
Account No.: **18-1586372-3**
Meter No.: **60595693** 2 Inch

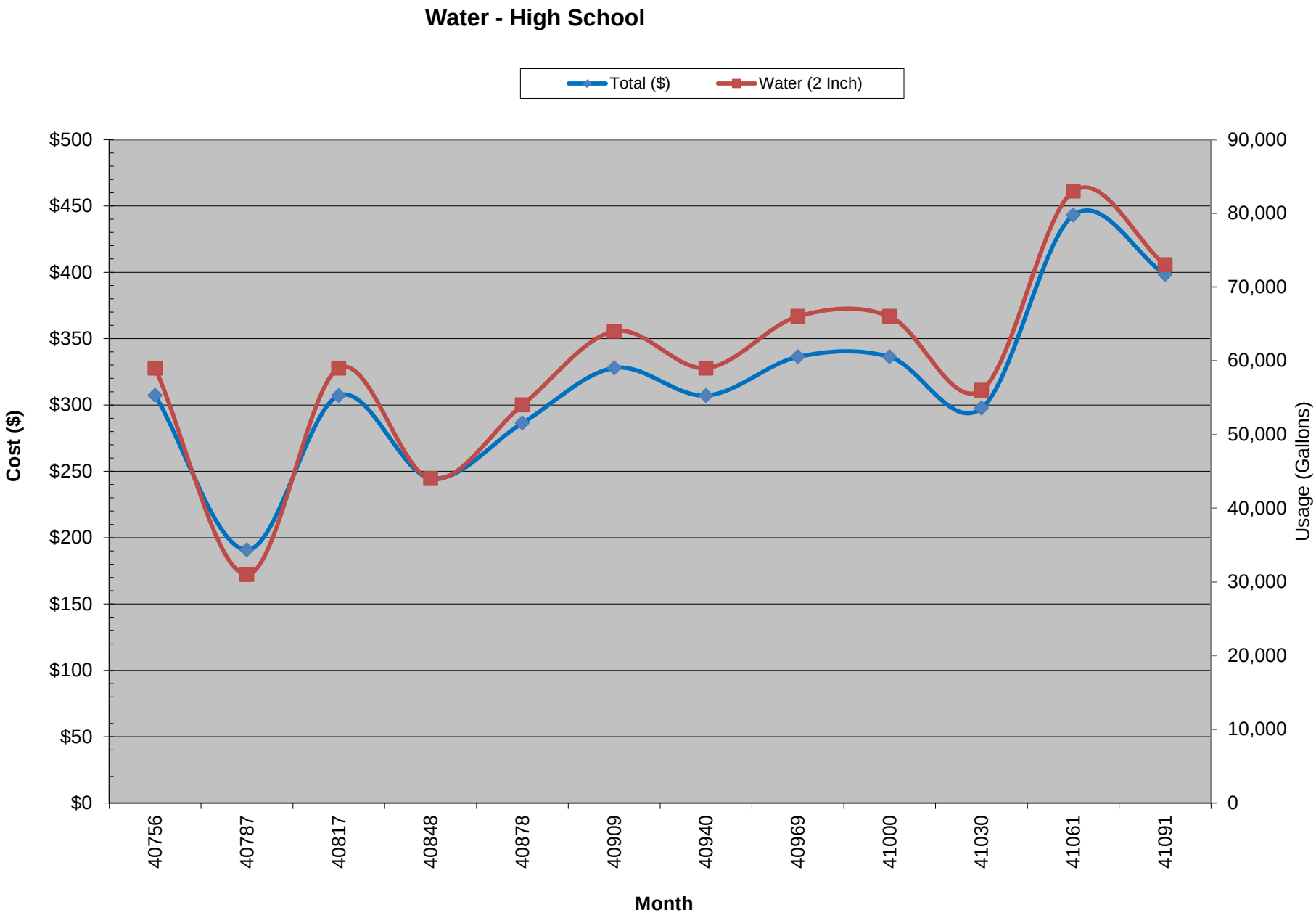
Month	Total ($)	Gallons (2 Inch)	$/kGal
Aug-11	$ 419.46	86,000	$ 4.88
Sep-11	$ 332.15	65,000	$ 5.11
Oct-11	$ 381.89	77,000	$ 4.96
Nov-11	$ 294.64	56,000	$ 5.26
Dec-11	$ 332.03	65,000	$ 5.11
Jan-12	$ 394.36	80,000	$ 4.93
Feb-12	$ 394.36	80,000	$ 4.93
Mar-12	$ 410.96	84,000	$ 4.89
Apr-12	$ 423.43	87,000	$ 4.87
May-12	$ 381.26	76,000	$ 5.02
Jun-12	$ 568.21	111,000	$ 5.12
Jul-12	$ 496.69	95,000	$ 5.23
Total	**$ 3,695.94**	**962,000**	**$ 5.02**


Water - High School
Total ($)
Water (2 Inch)
$600
$500
$400
$300
$200
$100
$0
Cost ($)
120,000
100,000
80,000
60,000
40,000
20,000
0
Usage (Gallons)
40756
40787
40817
40848
40878
40909
40940
40969
41000
41030
41061
41091
Month

Penns Grove Board of Education
144 Field Street, Penns Grove, NJ 08069

For Service at: **High School**
Account No.: **18-1586370-7**
Meter No.: **60591865** 2 Inch

Month	Total ($)	Gallons (2 Inch)	$/kGal
Aug-11	$ 307.23	59,000	$ 5.21
Sep-11	$ 190.84	31,000	$ 6.16
Oct-11	$ 307.11	59,000	$ 5.21
Nov-11	$ 244.80	44,000	$ 5.56
Dec-11	$ 286.34	54,000	$ 5.30
Jan-12	$ 327.88	64,000	$ 5.12
Feb-12	$ 307.11	59,000	$ 5.21
Mar-12	$ 336.20	66,000	$ 5.09
Apr-12	$ 336.20	66,000	$ 5.09
May-12	$ 297.51	56,000	$ 5.31
Jun-12	$ 443.04	83,000	$ 5.34
Jul-12	$ 398.34	73,000	$ 5.46
Total	**$ 2,977.42**	**714,000**	**$ 5.34**


Water - High School
Total ($)
Water (2 Inch)
$500
$450
$400
$350
$300
$250
$200
$150
$100
$50
$0
Cost ($)
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Usage (Gallons)
40756
40787
40817
40848
40878
40909
40940
40969
41000
41030
41061
41091
Month

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**

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APPENDIX B

Equipment Inventory

New Jersey BPU Energy Audit Program
CHA #24510
Penns Grove School District
High School
Original Construction Date: 1971

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.
DHW Heater	1	Bradford White	MII50-18-3SF-42	XB-01-1336	Electric	50 Gallons /18 kW	Mechanical Room	School	2010	18	New
Boiler-1	4	Aerco	BMK-3.0	N/A	Condensing boiler	3,000 MBH	N/A	School	2007	30	New
Main Pump	1	N/A	N/A	N/A	Pump	30 HP	N/A	School	1971	-21	New w/ VFD
DHW Heater	2	State - Sandblaster	S8FT0360NEASME	L00157700	Domestic Hot Water	70 Gallons /340.3 Gal/Hr /360 MBH Input	Mechanical Room	School	1971	-21	New
Air compressor	1	Duplex	N/A	N/A	N/A	1 HP	Mechanical Room	School	1971	-21	N/A
DW Booster Heater	1	Hatco	C-45	N/A	N/A	45 kW	Kitchen	Kitchen	2004	12	N/A
DHW Heater	3	N/A	N/A	N/A	Electric	40 Gal	Janitor's Closet	School	1971	-21	N/A
Window AC	Many	Airwell-Fedders	AZ7Y12F2A	N/A	HVAC /Electric	12,000 Btu	Classrooms	Classrooms	1995	-7	N/A
DX UV		Enviro Master International	N/A	N/A	Split System DX Cooling	N/A	Classrooms	Classrooms	2005	13	N/A
Heat Pump	1	FLA?	CH013-IAL0-B00	N/A	HVAC /Water Cooled /208/230 Electric	N/A	Mechanical Room	School	1971	-26	N/A
UV	1	Nesbitt	W09	N/A	HVAC /1Phase /277 V Electric	9,000 Btu	N/A	N/A	1971	-21	New
HV Unit	1	Nesbitt	4W24 2	N/A	N/A	N/A	N/A	N/A	1971	-21	N/A
HV Unit	4	Nesbitt	N/A	N/A	N/A	2 HP	Gym	Gym	1971	-21	NG Piping available
HV Unit	1	Nesbitt	N/A	N/A	N/A	5-7.5 HP	Auditorium	Auditorium	1971	-21	currently being converted to rooftop
HV Unit	1	Nesbitt	N/A	N/A	N/A	5 hp	cafeteria	cafeteria	1971	-21	N/A

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 Domestic Hot Water Heater	21,000	5,200	4.0	300	4.0	X
ECM-2	Replace Exterior Door Seals & Sweeps	9,000	400	>20	0	>20	
ECM-3	Demand Control Ventilation (Classrooms/Large Areas)	17,000	1,500	11.3	0	11.3	
ECM-4	Program Night Setback Controls on Boiler Controls	12,000	3,000	4.0	0	4.0	X
ECM-5	Replace Electric Booster Heater w/ Natural gas	16,000	1,800	8.9	500	8.6	X
ECM-6	Install High Efficiency Motors & VSDs on Fans	5,000	1,100	4.5	100	4.5	X
ECM-7	Lighting Replacements/Upgrades	174,000	14,000	12.4	11,100	11.6	
ECM-8	Lighting Controls (Occupancy Sensors)	17,400	10,100	1.7	3,000	1.4	X
ECM-9	Lighting Replacements/Upgrades & Controls (Occupancy Sensors)	192,000	20,500	9.4	14,100	8.7	X
ECM-10	Water Conservation (Low Flow Fixtures)	39,000	2,000	19.5	0	19.5	

Penns Grove-Carneys Point Regional School District - NJBPU
CHA Project #24510
Penns Grove High School

ECM Summary Sheet

ECM-1 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
21,000	47,700	0	-1,400	5,200	0	5,200	2.0	300	4.0	4.0

ECM-2 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
9,000	0	0	400	400	0	400	(0.8)	0	>20	>20

ECM-3 Demand Control Ventilation (Classrooms/Large 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
17,000	0	0	1,500	1,500	0	1,500	0.3	0	11.3	11.3

ECM-4 Program Night Setback Controls on Boiler Controls

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	0	0	3,000	3,000	0	3,000	3.6	0	4.0	4.0

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
16,000	22,700	45	-1,000	1,800	0	1,800	3.5	500	8.9	8.6

ECM-6 Install High Efficiency Motors & VSDs on Fans

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	7,700	0	0	1,100	0	1,100	3.2	100	4.5	4.5

ECM-7 Lighting Replacements/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
174,000	100,500	38	0	14,000	0	14,000	0.2	11,100	12.4	11.6

ECM-8 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
17,400	73,100	0	0	10,100	0	10,100	7.7	3,000	1.7	1.4

ECM-9 Lighting Replacements/Upgrades & 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
192,000	158,100	38	0	20,500	0	20,500	0.6	14,100	9.4	8.7

ECM-10 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
39,000	0	0	0	2,000	0	2,000	0.0	0	19.5	19.5

Penns Grove-Carneys Point Regional School District - NJBPU
CHA Project #24510

Utility Costs		Yearly Usage	MTCDE	Building Area	Annual Utility Cost	
$ 0.138	$/kWh blended		0.00042021	166,000	Electric	Natural Gas
$ 0.112	$/kWh supply	992,250	0.00042021		137,180	62,625
$ 6.00	$/kW	308	0			
$ 1.00	$/Therm	62,862	0.00533471			
$ 5.34	$/kgals	962	0			

Penns Grove High 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	$								therms		kW	kWh	therms	cooling	kgal/yr	$	
ECM-1	Replace Domestic Hot Water Heater	18.0	47,658	(1,402)	0	0	$ 5,200	$ 20,617	4.0	12.5	12	$ 300	N	$ -	$ 300	3.9	216.0	571,902	(16,828)	0	0	$ 62,777	2.0
ECM-2	Replace Exterior Door Seals & Sweeps	0.0	0	448	0	0	$ 400	$ 9,057	22.6	2.4	5		N	$ -	$ -	22.6	0.0	0	2,238	0	0	$ 2,238	(0.8)
ECM-3	Demand Control Ventilation (Classrooms/Large Areas)	0.0	0	1,506	0	0	$ 1,500	$ 17,100	11.4	8.0	15		N	$ -	$ -	11.4	0.0	0	22,586	0	0	$ 22,586	0.3
ECM-4	Program Night Setback Controls on Boiler Controls	0.0	0	3,038	0	0	$ 3,000	$ 12,000	4.0	16.2	18		N	$ -	$ -	4.0	0.0	0	54,689	0	0	$ 54,689	3.6
ECM-5	Replace Electric Booster Heater w/ Natural gas	45.0	22,680	(968)	0	0	$ 1,800	$ 16,100	8.9	4.4	15	$ 525	N	$ -	$ 525	8.7	675.0	340,200	(14,514)	0	0	$ 72,189	3.5
ECM-6	Install High Efficiency Motors & VSDs on Fans	0.0	7,715	0	0	0	$ 1,100	$ 4,600	4.2	3.2	18	$ 54	N	$ -	$ 54	4.1	0.0	138,876	0	0	0	$ 19,165	3.2
ECM-7	Lighting Replacements/Upgrades	38.1	100,546	0	0	0	$ 14,000	$ 174,490	12.5	42.3	15	$ 11,080	N	$ -	$ 11,080	11.7	572.1	1,508,197	0	0	0	$ 210,112	0.2
ECM-8	Lighting Controls (Occupancy Sensors)	0.0	73,089	0	0	0	$ 10,100	$ 17,415	1.7	30.7	15	$ 3,010	N	$ -	$ 3,010	1.4	0.0	1,096,333	0	0	0	$ 151,294	7.7
ECM-9	Lighting Replacements/Upgrades & Controls (Occupancy Sensors)	38.1	158,108	0	0	0	$ 20,500	$ 191,905	9.4	66.4	15	$ 14,090	N	$ -	$ 14,090	8.7	572.1	2,371,616	0	0	0	$ 306,815	0.6
ECM-10	Water Conservation (Low Flow Fixtures)	0.0	0	0	0	377	$ 2,000	$ 38,500	19.3	0.0	20		N	$ -	$ -	19.3	0.0	0	0	0	7,544	$ 40,284	0.0
	Total	**101**	**236,162**	**2,622**	**0**	**377**	**$ 59,600**	**$ 501,784**	**8.4**	**186.2**		**$ 29,059**		**$ -**	**$ 29,059**		**2,035**	**6,027,124**	**48,171**	**-**	**7,544**	**$ 942,150**	
	Total Measures with Payback <15	**101**	**236,162**	**2,174**	**0.0**	**0.0**	**$ 33,100**	**$ 262,322**	**7.9**	**102.8**		**$ 14,969**			**$ 14,969**		**1,463**	**3,422,594**	**23,348**		**-**	**$ 515,635**	
	% of Existing	**33%**	**24%**	**4%**	**0%**	**39%**																	

ECM-1: Replace three (3) Electric DHW Heatesr w/ three (3) Tankless Condensing Gas-Fired DHW Heater

Summary

* Replace Electric DHW Heater w/ Instantaneous, Condensing, Gas-Fired DHW Heater

Item	Value	Units	Formula/Comments
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	956	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	134,530	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	130	Gallons	Per manufacturer nameplate
Hot Water Temperature	120	˚F	Per building personnel
Average Room Temperature	70	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	1.4	MBH	
Annual Standby Hot Water Load	11,863	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	146,393	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	90%		Per Manufacturer
Total Annual Energy Required	162,658	Mbtu/yr	
Total Annual Electric Required	**47,658**	**kWh/yr**	**Electrical Savings**
Average Annual Electric Demand	5.44	kW	
Peak Electric Demand	**18.00**	**kW**	**Per Manufacturer's Nameplate (Demand Savings)**
New Tank Size	1	Gallons	tankless
Hot Water Temperature	120	˚F	
Average Room Temperature	70	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.0	MBH	
Annual Standby Hot Water Load	91	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	134,621	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Navien CR180 instantaneous, condensing DHW Heater
Proposed Total Annual Energy Required	140,230	MBTU/yr	
Proposed Fuel Use	1,402	Therms/yr	Standby Losses and inefficient DHW heater eliminated
Elec Utility Demand Unit Cost	$6.00	$/kW	
Elec Utility Supply Unit Cost	$0.112	$/kWh	
NG Utility Unit Cost	$1.00	$/Therm	
Existing Operating Cost of DHW	$6,634	$/yr	
Proposed Operating Cost of DHW	$1,402	$/yr	
Annual Utility Cost Savings	**$5,231**	**$/yr**	

Daily Hot Water Demand

			#USES PER DAY		FULL TIME OCCUPANTS**				
FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	MALE	FEMALE	MALE	FEMALE	TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
LAVATORY (Low-Flow Lavs use 0.5 GPM)	2.5	0.25	3	3	332	332	1245	50%	623
SHOWER	2.5	5	1	1	15	15	375	75%	281
KITCHEN SINK	2.5	0.5	1	1	5	5	13	75%	9
MOP SINK	2.5	2	1	1	3	3	30	75%	23
Dishwasher (gal per u	10	1	1	0	2	2	20	100%	20
						TOTAL	1663		**956**

ECM-1: Replace Electric DHW Heater w/ Tankless Condensing Gas-Fired DHW Heater 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.		
Gas-Fired DHW Heater Removal	3	LS		$ 150		$ -	$ 551	$ -	$ 551	
High Efficiency Gas-Fired DHW Heater	3	LS	$ 1,500	$ 1,000		$ 4,392	$ 3,672	$ -	$ 8,064	
Miscellaneous Electrical	3	LS	$ 300	$ 300		$ 878	$ 1,102	$ -	$ 1,980	
Venting Kit	3	EA	$ 450	$ 650		$ 1,318	$ 2,387	$ -	$ 3,704	
Miscellaneous Piping and Valves	3	LS	$ 200	$ 200		$ 586	$ 734	$ -	$ 1,320	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

Note: costs are used for energy savings calulations only. Do not use for procurement

$ 15,619	Subtotal
$ 1,562	10% Contingency
$ 3,436	20% Contractor O&P
$ -	
$ 20,617	**Total**

ECM-2: 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	860.92		Cooling Occ Enthalpy Setpoint	27.5	Btu/lb	Electricity	$ 0.138	$/kWh
Existing Infiltration Factor*	1.5	cfm/LF	Cooling Unocc Enthalpy Setpoint	27.5	Btu/lb	Natural Gas	$ 0.98	$/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	87,168		82,984		26,150		24,895		0	0	41	12
TOTALS		**8,796**	**2,099**	**6,697**									**0**	**0**	**649**	**195**

Existing Door Infiltration	**1,291**	**cfm**
Existing Unoccupied Door Infiltration	**1,291**	**cfm**
Proposed Door Infiltration	**387**	**cfm**
Proposed Unoccupied Door Infiltration	**387**	**cfm**

Savings	**454**	**therms**	**$**	**448**
	0	**kWh**	**$**	**-**
			$	**448**

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-2: Install Door Seals Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									$ -	
Door Seals (3'x7')	44	ea	$ 35	$ 50	$ -	$ 1,503	$ 2,693	$ -	$ 4,196	
36" Door Threshold Seal	44	ea	$ 50.00	$ 45.00	$ -	$ 2,147	$ 2,424	$ -	$ 4,571	
Side and Top Door Seal	44	ft	$ 3.00	$ 3.00		$ 129	$ 162	$ -	$ 290	
						$ -	$ -	$ -	$ -	

Note: costs are used for energy savings calulations only. Do not use for procurement

$ 9,057	Subtotal
$ -	
$ -	
$ -	
$ 9,057	**Total**

Penns Grove-Carneys Point Regional School District - NJBPU
CHA Project #24510
Penns Grove High School

	Total CFM	O.A. CFM	O.A. %	
Org. scheduled CFM	20,000	4,000	20%	*5 units at 4,000 cfm total. Outside air is assumed 20% of total. De-rated cfm is 50% of original
Derated CFM	20,000	2,000	10%	
SA Enthalpy	26.4	BTU/lbma		
SA Set point, Winter	68.0	°F		
SA Set point, Summer	74.0	°F		
Heating "On" Point	55.0	°F		
Cooling System Eff.		kW/Ton		(Includes ancillary equipment)
Heating System Eff.	80%			(Includes distribution losses)

ECM-3: Install Demand Control Ventilation

Description:
Outside air can be significantly reduced for most of the time that the building is occupied.
Savings will result from the avoided heating and cooling of excessive outside air.

Method:
The outdoor air introduced into the spaces is currently constant based on design occupancy conditions.
This ECM proposes the installation of CO2 sensors in the space to allow for reduced outdoor air flows when conditions allow.
An average reduction of 50% is assumed possible with the implementation of DCV
The DCV system will automatically adjust the outdoor air damper position through the EMS to reduce outdoor air flows based on indoor CO2 levels.
This ECM has been interacted with the new boiler ECMs and accounts for the reduced operating hours of the unit via EMS scheduling.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
			Existing					Proposed Demand Ventilation					Savings	
Avg. DB Bin Temp °F	OA Enthalpy Btu/lb	Occupied Bin HOURS	OA CFM	Cooling Load MBH	Heating Load MBH	Cooling kWh	Heating therms	Derated O.A. CFM	Cooling Load MBH	Heating Load MBH	Cooling kWh	Heating therms	Cooling kWh	Heating therms
103	49	0	4,000	409	0	0	-	2,000	204	0	0	-	0	-
97.5	43	2	4,000	290	0	0	-	2,000	145	0	0	-	0	-
92.5	40	16	4,000	236	0	0	-	2,000	118	0	0	-	0	-
87.5	37	52	4,000	184	0	0	-	2,000	92	0	0	-	0	-
82.5	34	106	4,000	137	0	0	-	2,000	68	0	0	-	0	-
77.5	32	170	4,000	94	0	0	-	2,000	47	0	0	-	0	-
72.5	29	237	4,000	50	0	0	-	2,000	25	0	0	-	0	-
67.5	27	264	4,000	11	0	0	-	2,000	5	0	0	-	0	-
62.5	25	273	4,000	0	0	0	-	2,000	0	0	0	-	0	-
57.5	21	262	4,000	0	0	0	-	2,000	0	0	0	-	0	-
52.5	19	239	4,000	0	67	0	200	2,000	0	33	0	100	0	100
47.5	16	235	4,000	0	89	0	261	2,000	0	44	0	130	0	130
42.5	14	245	4,000	0	110	0	337	2,000	0	55	0	169	0	169
37.5	13	264	4,000	0	132	0	435	2,000	0	66	0	217	0	217
32.5	11	256	4,000	0	153	0	491	2,000	0	77	0	246	0	246
27.5	9	194	4,000	0	175	0	424	2,000	0	87	0	212	0	212
22.5	7	114	4,000	0	197	0	279	2,000	0	98	0	140	0	140
17.5	6	88	4,000	0	218	0	239	2,000	0	109	0	119	0	119
12.5	4	56	4,000	0	240	0	167	2,000	0	120	0	84	0	84
7.5	3	33	4,000	0	261	0	107	2,000	0	131	0	54	0	54
2.5	1	13	4,000	0	283	0	45	2,000	0	141	0	23	0	23
-2.5	0	7	4,000	0	305	0	26	2,000	0	152	0	13	0	13
-7.5	-2	3	4,000	0	326	0	12	2,000	0	163	0	6	0	6
Total		**3,129**		**1,409**		**0**	**3,011**		**705**		**0**	**1,506**	**0**	**1,506**

Site Name - NYSERDA Flextech
CHA Project #
Building Name

ECM-3: Install Demand Control Ventilation - Cost

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.		
CO2 sensor	2	ea	$ 400	$ 100	$ -	$ 880	$ 270	$ -	$ 1,150	
Replace damper actuators	2	ea	$ -	$ 50	$ -	$ -	$ 135	$ -	$ 135	
Control system programming	2	ls	$ 500	$ 1,000	$ -	$ 1,100	$ 2,700	$ -	$ 3,800	
electrical/wiring	2	ls	$ 1,000	$ 2,000	$ -	$ 2,200	$ 5,400	$ -	$ 7,600	

Note: costs are used for energy savings calulations only. Do not use for procurement

$ 12,700	Subtotal
$ 2,500.00	20% Contingency
$ 1,900.00	15% Contractor O&P
$ -	0% Engineering
$ 17,100	**Total**

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

ECM-4: Program Nightset Back on Boiler Controls

EXISTING CONDITIONS		
Existing Facility Total Electric usage	992,250	kWh
Existing Facility Natural Gas Usage	60,766	therms
Cost of Electricty	$ 0.138	$/kWh
Cost of Natural Gas	$ 0.98	$/therm
SAVINGS		
TOD Electric savings	0	kWh
TOD Natural Gas savings	3,038	therms
Total Cost Savings	$ 2,992	
Estimated Total Project Cost	$ 12,000	[4]
Simple Payback	4.0	**years**

ote: costs are used for energy savings calulations only. Do not use for procurement

Assumptions

1 0% Approximate electric savings due to night setback (No Air Conditioning in School)

2 5% Approximate natural gas savings due to night setback

3 Project cost is an estimate, includes cost of replacing non- programmbale thermostats with programmbale thermostats

4 control work cost

TITLE: **ECM-5: 'Booster Heater Conversion (Electric to Gas)**
PROJECT: Penns Grove-Carneys Point Regional School District - NJBPU
SITE: Penns Grove High School

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

GIVEN:

Electrical Energy Cost	=	$0.138	$/kWh
Electrical Demand Cost	=	$ 6.00	$/kW
Fuel Energy Cost	=	$1.00	$/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**	)*(	$0.138	)+(	**45**	)*(	$6.00	) =	**$ 3,400**

	Therm		$/fuel unit		
Proposed Energy Cost = (	**968**	)*(	$1.000	) =	**$ 968**

Result

	Existing Annual Use=	**22,680**	**Kwh**	**45**	**Kw**	**$ 3,400**
	Proposed Annual Use=			**968**	**Therm**	**$ 968**
100%	**Annual Savings=**	**22,680**	**Kwh**	**45**	**Kw**	**$ 2,432**
	Savings as Percent of Existing	**=**		**(968)**	**Therm**	**72%**

$/MCF (Nat'	1	1,030,000	btu/MCF	MCF	Mbh/MCF	1,030
$/CCF (Nat'	2	103,000	btu/CCF	CCF	Mbh/CCF	103
$/CF (Nat'l (	3	1,030	btu/CF	CF	Mbh/CF	1.030
$/Therm (Na	4	100,000	btu/Therm	Therm	Mbh/Therm	100
$/gal (LP Ga	5	91,500	btu/gallon	gallons	Mbh/gallon	91.5

0

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

ECM-5: 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	
15 MBH Natural Gas Booster Heater	1	ea	$ 7,000	$ 150		$ 6,832	$ 184	$ -	$ 7,016	
Natural Gas Piping	1	ls	$ 200	$ 1,000	$ -	$ 195	$ 1,224	$ -	$ 1,419	
Wiring	1	ls	$ 500	$ 500	$ -	$ 488	$ 612	$ -	$ 1,100	
Venting	1	ls	$ 500	$ 1,000	$ -	$ 488	$ 1,224	$ -	$ 1,712	

Note: costs are used for energy savings calulations only. Do not use for procurement

$ 11,900	Subtotal
$ 2,400.00	20% Contingency
$ 1,800.00	15% Contractor O&P
$ -	0% Engineering
$ 16,100	**Total**

ECM-6: Install Variable Speed Drives - AHU Fans

UNIT	HP	Existing Motor Eff (Note 1)	New Motor Eff (Note 1)	Existing Motor kW	New Motor kW
HV (Cafe)	5.0	87.5%	90.2%	3.41	3.31
				3.41	3.31

Building Balance Point
60.0

VFD Eff. (CC)	98.5%

OAT - DB Avg Temp F (A)	Bin Hours (B)	Occupied Hours in Bin (C)	AHU Hours in Bin (D)	Existing Fan Kw (F)	Existing Fan kWh (F)	Fan Load % (E)	Proposed Fan kW (G)	Speed efficiency % (H)	Proposed Fan kWh (I)	Savings Fan kWh (J)
102.5	0	0	0	3.4	0	50%	0.42	81.5%	0	0
97.5	6	2	2	3.4	7	50%	0.42	81.5%	1	6
92.5	45	16	16	3.4	55	50%	0.42	81.5%	8	47
87.5	146	52	52	3.4	178	50%	0.42	81.5%	27	151
82.5	298	106	106	3.4	363	50%	0.42	81.5%	55	308
77.5	476	170	170	3.4	580	50%	0.42	81.5%	88	492
72.5	662	237	237	3.4	807	50%	0.42	81.5%	122	685
67.5	740	264	264	3.4	902	50%	0.42	81.5%	136	765
62.5	765	273	273	3.4	932	50%	0.42	81.5%	141	791
57.5	733	262	262	3.4	893	52%	0.47	83.5%	149	744
52.5	668	239	239	3.4	814	56%	0.60	87.2%	164	650
47.5	659	235	235	3.4	803	60%	0.74	90.4%	193	610
42.5	685	245	245	3.4	835	65%	0.90	93.2%	238	597
37.5	739	264	264	3.4	900	69%	1.09	95.5%	302	599
32.5	717	256	256	3.4	874	73%	1.30	97.4%	342	531
27.5	543	194	194	3.4	662	77%	1.54	98.9%	302	360
22.5	318	114	114	3.4	387	81%	1.80	99.9%	205	183
17.5	245	88	88	3.4	299	85%	2.09	100.0%	183	115
12.5	156	56	56	3.4	190	90%	2.41	100.0%	135	56
7.5	92	33	33	3.4	112	94%	2.77	100.0%	91	21
2.5	36	13	13	3.4	44	98%	3.15	99.6%	41	3
-2.5	19	7	7	3.4	23	100%	3.36	99.0%	23	0
-7.5	8	3	3	3.4	10	100%	3.36	99.0%	10	0
TOTALS		**3,129**	**3,129**	**78**	**10,669**				**2,954**	**7,715**

Notes:

1) Existing motor power based on operation with existing motor efficiency, operating at 80% load factor when at full load. Formula: Motor HP x 0.746 x 0.8 / Exist. Motor Eff., New motor power is based on same formula using the new motor efficiency.
2) Weather data from NOAA for Concord, MA
3) Occupied & AHU Bin Hours are based upon existing schedule.
4) The required VFD motor power draw is based on a 3.0 power relationship to load, since system static pressure will not be controlled.

INSTALL VARIABLE SPEED DRIVES - SAVINGS SUMMARY					
	Electric Demand	Electric Usage	Nat Gas Usage	Maint.	Total Cost
	(kW)	(kWh)	(Therms)	($)	($)
Savings	**0**	**7,715**	**0**	**$0**	**$1,065**

Site Name - NYSERDA Flextech
CHA Project #
Building Name

ECM-6: Install High Frequency Motors & VSDs on Motors (Gym Café) - 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.		
New High Efficiency Motor Replacement (5 Hp)	1	ea	$ 373	$ 79		$ 364	$ 96	$ -	$ 460	
Install VSD on Motor	1	ea	$ 1,706	$ 431	$ -	$ 1,665	$ 527	$ -	$ 2,192	
Electrical Wiring	1	ls	$ 500	$ 250	$ -	$ 488	$ 306	$ -	$ 794	

Note: costs are used for energy savings calulations only. Do not use for procurement

$	3,400	Subtotal
$	700.00	20% Contingency
$	500.00	15% Contractor O&P
$	-	0% Engineering
$	**4,600**	**Total**

ECM-7 W1: Replace urinals and flush valves with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$5.34	$ / kGal
Urinals in Building	21	
Average Flushes / Urinal (per Day)	13	uses per day
Average Gallons / Flush	1.5	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	21	
Proposed Gallons / Flush	0.5	Gal
Proposed Material Cost	$176	
Proposed Installation Cost	$228	
Total cost of new urinals & valves	$8,484	

SAVINGS		
Current Urinal Water Use	155	kGal / year
Proposed Urinal Water Use	52	kGal / year
Water Savings	103	kGal / year
Cost Savings	$552	/ year
Simple Payback	15.38	years

ECM-7 W3: Replace toilets and flush valves with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$5.34	$ / kGal
Toilets in Building	31	
Average Flushes / Toilet (per Day)	9	uses / day
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	31	
Proposed Gallons / Flush	1.6	Gal
Proposed Material Cost of new Flush Valves	$520	
Proposed Installation cost of new Flush Valves	$252	
Total cost of new toilets & valves	$23,932	

SAVINGS		
Current Toilet Water Use	362	kGal / year
Proposed Toilet Water Use	165	kGal / year
Water Savings	196	kGal / year
Cost Savings	$1,048	/ year
Simple Payback	22.83	years

ECM-7 W4: Replace faucets with low flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$5.34	$ / kGal
Faucets in Building	39	
Average Uses / Faucet (per day)	7	uses/day
Average Time of Use	0.5	min
Average Flowrate	3.0	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	39	
Proposed Flowrate	1.5	gpm
Proposed Material Cost of new Faucets	$70	
Proposed Installation cost of new Faucets	$86	
Total cost of new faucets	$6,084	

SAVINGS		
Current Faucet Water Use	155	kGal / year
Proposed Faucet Water Use	78	kGal / year
Water Savings	78	kGal / year
Cost Savings	$414	/ year
Simple Payback	14.7	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
$174,490	**38.1**	**100,546**	**0**	**$16,646**	**0**	**$16,646**	**$11,080**	**10.5**	**9.8**

*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
$17,415	**0.0**	**73,089**	**0**	**$10,105**	**0**	**$10,105**	**$3,010**	**1.7**	**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
$191,905	**38.1**	**158,108**	**0**	**$24,604**	**0**	**$24,604**	**$14,090**	**7.8**	**7.2**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Energy Audit of Penns Grove High School

CHA Project No. 24510

Existing Lighting

Cost of Electricity: **$0.138** **$/kWh**

$6.00 **$/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
18	109	Classrooms	12	T 32 R F 4 (ELE)	F44ILL	112	1.34	SW	2400	C-OCC	3,226	
18	111	Classrooms	12	T 32 R F 4 (ELE)	F44ILL	112	1.34	SW	2400	C-OCC	3,226	
13	113	Classrooms	5	S 32 P F 2 (ELE)	F42LL	60	0.30	SW	2400	C-OCC	720	
18	107	Classrooms	12	T 32 R F 4 (ELE)	F44ILL	112	1.34	SW	2400	C-OCC	3,226	
3	Boys Bathroom	Bath Room	5	W 34 W F 1 (MAG)	F41EE	43	0.22	SW	2000	NONE	430	
3	Girls Bathroom	Bath Room	5	W 34 W F 1 (MAG)	F41EE	43	0.22	SW	2000	NONE	430	
18	105	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	104	Classrooms	12	T 32 R F 4 (ELE)	F44ILL	112	1.34	SW	2400	C-OCC	3,226	
18	103	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
20	102	Classrooms	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307	
18	101	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	100	Classrooms	12	T 32 R F 4 (ELE)	F44ILL	112	1.34	SW	2400	C-OCC	3,226	
18	99	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
20	98	Classrooms	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307	
18	97	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	96	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	94	Classrooms	9	T 32 R F 4 (ELE)	F44ILL	112	1.01	SW	2400	C-OCC	2,419	
18	95	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	Assistant Principle	Offices	6	T 32 R F 4 (ELE)	F44ILL	112	0.67	SW	2400	C-OCC	1,613	
18	93	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	91	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	90	Classrooms	16	T 32 R F 4 (ELE)	F44ILL	112	1.79	SW	2400	C-OCC	4,301	
16	Janitor Closet	Storage/Janitor	1	T 34 R F 2 (MAG)	F42EE	72	0.07	SW	500	C-OCC	36	
18	Library	Classrooms	48	T 32 R F 4 (ELE)	F44ILL	112	5.38	SW	2400	C-OCC	12,902	
16	Athletic Director	Offices	4	T 34 R F 2 (MAG)	F42EE	72	0.29	SW	2400	C-OCC	691	
16	87A,B	Classrooms	20	T 34 R F 2 (MAG)	F42EE	72	1.44	SW	2400	C-OCC	3,456	
215	Gym	Gymnasium	46	High Bay MH 350	MHPS/SCWA/350/1	400	18.40	SW	2912	NONE	53,581	
3	Mens Locker Room	Locker	32	W 34 W F 1 (MAG)	F41EE	43	1.38	SW	2800	NONE	3,853	
20	Mens Locker Room	Locker	8	S 32 C F 1 (ELE)	F41LL	32	0.26	SW	2800	NONE	717	
11	Gym Electrical Room	Electrical / Janitor	2	S 34 P F 2 (MAG)	F42EE	72	0.14	SW	8760	C-OCC	1,261	
18	73	Classrooms	16	T 32 R F 4 (ELE)	F44ILL	112	1.79	SW	2400	C-OCC	4,301	
18	71	Classrooms	15	T 32 R F 4 (ELE)	F44ILL	112	1.68	SW	2400	C-OCC	4,032	
13	71	Classrooms	1	S 32 P F 2 (ELE)	F42LL	60	0.06	SW	2400	C-OCC	144	
39	71	Classrooms	1	2' 17 W F 2 (ELE)	F22ILL	33	0.03	SW	2400	C-OCC	79	
18	69	Classrooms	21	T 32 R F 4 (ELE)	F44ILL	112	2.35	SW	2400	C-OCC	5,645	
20	67	Classrooms	24	S 32 C F 1 (ELE)	F41LL	32	0.77	SW	2400	C-OCC	1,843	
16	65	Classrooms	20	T 34 R F 2 (MAG)	F42EE	72	1.44	SW	2400	C-OCC	3,456	
141LED	63 - Cafeteria	Cafeteria	28	HPS 200	HPS200/1	250	7.00	SW	1600	NONE	11,200	
18	59	Classrooms	14	T 32 R F 4 (ELE)	F44ILL	112	1.57	SW	2400	C-OCC	3,763	
20	61	Classrooms	2	S 32 C F 1 (ELE)	F41LL	32	0.06	SW	2400	C-OCC	154	
115	61 - Bathroom	Bath Room	1	W 20 C F 2	F22SS	56	0.06	SW	2000	NONE	112	
16	Gym Mens Bathroom	Bath Room	2	T 34 R F 2 (MAG)	F42EE	72	0.14	SW	2000	NONE	288	
11	Gym Janitor Closet	Storage/Janitor	2	S 34 P F 2 (MAG)	F42EE	72	0.14	SW	500	C-OCC	72	
11	Gym Accent	Gymnasium	20	S 34 P F 2 (MAG)	F42EE	72	1.44	SW	2912	C-OCC	4,193	
141LED	Wrestling	Gymnasium	18	HPS 200	HPS200/1	250	4.50	SW	2912	C-OCC	13,104	
11	Equipment Room	Locker	6	S 34 P F 2 (MAG)	F42EE	72	0.43	SW	2800	C-OCC	1,210	
16	Womens Locker Room	Locker	33	T 34 R F 2 (MAG)	F42EE	72	2.38	SW	2800	NONE	6,653	
16	Womens Locker Room Office	Offices	4	T 34 R F 2 (MAG)	F42EE	72	0.29	SW	2400	C-OCC	691	
96	Womens Locker Room Office Bathroom	Bath Room	2	W 17 C F 2	F22ILL	33	0.07	SW	2000	NONE	132	
71	Womens Locker Room Office Bathroom	Bath Room	1	I 60	I60/1	60	0.06	SW	2000	NONE	120	
11	Womens Sports Locker Room	Locker	3	S 34 P F 2 (MAG)	F42EE	72	0.22	SW	2800	NONE	605	
16	Womens Sports Locker Room	Locker	1	T 34 R F 2 (MAG)	F42EE	72	0.07	SW	2800	NONE	202	

Energy Audit of Penns Grove High School

CHA Project No. 24510

Existing Lighting

Cost of Electricity: **$0.138** **$/kWh**

$6.00 **$/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	Womens Locker Room Bathroom	Bath Room	2	T 34 R F 2 (MAG)	F42EE	72	0.14	SW	2000	NONE	288	
20	Womens Locker Room Bathroom	Bath Room	2	S 32 C F 1 (ELE)	F41LL	32	0.06	SW	2000	NONE	128	
39	Gym Womens Bathroom	Bath Room	1	2' 17 W F 2 (ELE)	F22ILL	33	0.03	SW	2000	NONE	66	
20	Gym Womens Bathroom	Bath Room	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2000	NONE	256	
16	Gym Womens Bathroom	Bath Room	2	T 34 R F 2 (MAG)	F42EE	72	0.14	SW	2000	NONE	288	
16	Gym Janitor Closet	Storage/Janitor	1	T 34 R F 2 (MAG)	F42EE	72	0.07	SW	500	C-OCC	36	
20	Gym Mens Bathroom	Bath Room	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2000	NONE	256	
18	57	Classrooms	25	T 32 R F 4 (ELE)	F44ILL	112	2.80	SW	2400	C-OCC	6,720	
13	57 Side Room	Storage/Janitor	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	500	C-OCC	60	
18	55	Classrooms	15	T 32 R F 4 (ELE)	F44ILL	112	1.68	SW	2400	C-OCC	4,032	
18	58	Classrooms	14	T 32 R F 4 (ELE)	F44ILL	112	1.57	SW	2400	C-OCC	3,763	
18	56	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	54	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	52	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	50	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
141LED	47	Classrooms	18	HPS 200	HPS200/1	250	4.50	SW	2400	C-OCC	10,800	
18	45	Classrooms	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	2400	C-OCC	1,075	
141LED	43	Classrooms	6	HPS 200	HPS200/1	250	1.50	SW	2400	C-OCC	3,600	
18	57 Back Side Room	Storage/Janitor	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	500	C-OCC	224	
13	41	Classrooms	2	S 32 P F 2 (ELE)	F42LL	60	0.12	SW	2400	C-OCC	288	
18	39	Classrooms	24	T 32 R F 4 (ELE)	F44ILL	112	2.69	SW	2400	C-OCC	6,451	
18	39 Office	Offices	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	2400	C-OCC	1,075	
71	39 Closet	Storage/Janitor	4	I 60	I60/1	60	0.24	SW	500	C-OCC	120	
18	Office 2	Offices	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	2400	C-OCC	269	
18	39 Office	Offices	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	2400	C-OCC	269	
18	37	Classrooms	24	T 32 R F 4 (ELE)	F44ILL	112	2.69	SW	2400	C-OCC	6,451	
20	37 Electrical Panel	Electrical / Janitor	6	S 32 C F 1 (ELE)	F41LL	32	0.19	SW	8760	C-OCC	1,682	
18	33	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
20	33 Mens Bathroom	Bath Room	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2000	NONE	320	
20	33 Womens Bathroom	Bath Room	5	S 32 C F 1 (ELE)	F41LL	32	0.16	SW	2000	NONE	320	
18	29	Classrooms	18	T 32 R F 4 (ELE)	F44ILL	112	2.02	SW	2400	C-OCC	4,838	
Y	Exterior	Outdoor Lighting	25	I 100	I100/1	100	2.50	SW	4368	C-OCC	10,920	
142LED	Exterior	Outdoor Lighting	17	MH 100	MH100/1	128	2.18	SW	4368	C-OCC	9,505	
169LED	Exterior	Outdoor Lighting	1	SP 250 MH ROOF	MH250/1	295	0.30	SW	4368	C-OCC	1,289	
18	27	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	26	Classrooms	16	T 32 R F 4 (ELE)	F44ILL	112	1.79	SW	2400	C-OCC	4,301	
18	25	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	24	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	23	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	22	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	21	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
20	20	Classrooms	4	S 32 C F 1 (ELE)	F41LL	32	0.13	SW	2400	C-OCC	307	
18	19	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	18	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12	SW	2400	C-OCC	2,688	
18	17	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	
18	16	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	
18	15	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	
18	14	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	
18	13	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	
20	12	Classrooms	4	S 32 C F 1 (ELE)	F41LL	32	0.13		2400	C-OCC	307	
18	11	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	
18	9	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	

Energy Audit of Penns Grove High School
CHA Project No. 24510
Existing Lighting

Cost of Electricity:	$0.138	$/kWh
	$6.00	$/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
18	8	Classrooms	8	T 32 R F 4 (ELE)	F44ILL	112	0.90		2400	C-OCC	2,150	
18	7	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	
18	6	Classrooms	10	T 32 R F 4 (ELE)	F44ILL	112	1.12		2400	C-OCC	2,688	
3	Boys Bathroom	Bath Room	5	W 34 W F 1 (MAG)	F41EE	43	0.22		2000	NONE	430	
3	Girls Bathroom	Bath Room	5	W 34 W F 1 (MAG)	F41EE	43	0.22		2000	NONE	430	
	Total		**1,103**				**130.86**				**331,794**	

Energy Audit of Penns Grove High School

CHA Project No. 24510

ECM-1 Lighting Replacements

Cost of Electricity: **$0.138 $/kWh**

$6.00 $/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
18	109	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	SW	2,400	2,765	461	0.2	$ 77.53	$ 1,275.00	$120	16.4	2.5
18	111	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	SW	2,400	2,765	461	0.2	$ 77.53	$ 1,275.00	$120	16.4	2.5
13	113	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	0	F42SSILL	48	0.2	SW	2,400	576	144	0.1	$ 24.23	$ 531.25	$50	21.9	3.3
18	107	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	SW	2,400	2,765	461	0.2	$ 77.53	$ 1,275.00	$120	16.4	2.5
3	Boys Bathroom	5	W 34 W F 1 (MAG)	F41EE	43	0.2	SW	2000	430	5	W 28 W F 1	F41SSILL	26	0.1	SW	2,000	260	170	0.1	$ 29.62	$ 875.00	$50	29.5	4.9
3	Girls Bathroom	5	W 34 W F 1 (MAG)	F41EE	43	0.2	SW	2000	430	5	W 28 W F 1	F41SSILL	26	0.1	SW	2,000	260	170	0.1	$ 29.62	$ 875.00	$50	29.5	4.9
18	105	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	104	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	SW	2,400	2,765	461	0.2	$ 77.53	$ 1,275.00	$120	16.4	2.5
18	103	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
20	102	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2,400	307	-	0.0	$ -	$ -	$0		
18	101	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	100	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	SW	2,400	2,765	461	0.2	$ 77.53	$ 1,275.00	$120	16.4	2.5
18	99	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
20	98	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2,400	307	-	0.0	$ -	$ -	$0		
18	97	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	96	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	94	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2400	2,419	9	0	F44SSILL	96	0.9	SW	2,400	2,074	346	0.1	$ 58.14	$ 956.25	$90	16.4	2.5
18	95	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	Assistant Principle	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	2400	1,613	6	0	F44SSILL	96	0.6	SW	2,400	1,382	230	0.1	$ 38.76	$ 637.50	$60	16.4	2.5
18	93	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	91	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	90	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,301	16	0	F44SSILL	96	1.5	SW	2,400	3,686	614	0.3	$ 103.37	$ 1,700.00	$160	16.4	2.5
16	Janitor Closet	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	500	36	1	T 28 R F 2	F42SSILL	48	0.0	SW	500	24	12	0.0	$ 3.39	$ 114.75	$10	33.9	8.7
18	Library	48	T 32 R F 4 (ELE)	F44ILL	112	5.4	SW	2400	12,902	48	0	F44SSILL	96	4.6	SW	2,400	11,059	1,843	0.8	$ 310.10	$ 5,100.00	$480	16.4	2.5
16	Athletic Director	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2400	691	4	T 28 R F 2	F42SSILL	48	0.2	SW	2,400	461	230	0.1	$ 38.76	$ 459.00	$40	11.8	1.8
16	87A,B	20	T 34 R F 2 (MAG)	F42EE	72	1.4	SW	2400	3,456	20	T 28 R F 2	F42SSILL	48	1.0	SW	2,400	2,304	1,152	0.5	$ 193.81	$ 2,295.00	$200	11.8	1.8
3	Mens Locker Room	32	W 34 W F 1 (MAG)	F41EE	43	1.4	SW	2800	3,853	32	W 28 W F 1	F41SSILL	26	0.8	SW	2,800	2,330	1,523	0.5	$ 249.74	$ 5,600.00	$320	22.4	3.5
20	Mens Locker Room	8	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2800	717	8	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2,800	717	-	0.0	$ -	$ -	$0		
11	Gym Electrical Room	2	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	8760	1,261	2	C 28 P F 2	F42SSILL	48	0.1	SW	8,760	841	420	0.0	$ 61.59	$ 212.50	$20	3.5	0.5
18	73	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,301	16	0	F44SSILL	96	1.5	SW	2,400	3,686	614	0.3	$ 103.37	$ 1,700.00	$160	16.4	2.5
13	71	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	0	F42SSILL	48	0.0	SW	2,400	115	29	0.0	$ 4.85	$ 106.25	$10	21.9	3.3
39	71	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	SW	2400	79	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	SW	2,400	79	-	0.0	$ -	$ -	$0		
18	69	21	T 32 R F 4 (ELE)	F44ILL	112	2.4	SW	2400	5,645	21	0	F44SSILL	96	2.0	SW	2,400	4,838	806	0.3	$ 135.67	$ 2,231.25	$210	16.4	2.5
20	67	24	S 32 C F 1 (ELE)	F41LL	32	0.8	SW	2400	1,843	24	S 32 C F 1 (ELE)	F41LL	32	0.8	SW	2,400	1,843	-	0.0	$ -	$ -	$0		
141LED	63 - Cafeteria	28	HPS 200	HPS200/1	250	7.0	SW	1600	11,200	28	FXLED78/1	FXLED78/1	78	2.2	SW	1,600	3,494	7,706	4.8	$ 1,411.95	$ 19,754.00	$280	14.0	2.5
18	59	14	T 32 R F 4 (ELE)	F44ILL	112	1.6	SW	2400	3,763	14	0	F44SSILL	96	1.3	SW	2,400	3,226	538	0.2	$ 90.45	$ 1,487.50	$140	16.4	2.5
115	61 - Bathroom	1	W 20 C F 2	F22SS	56	0.1	SW	2000	112	1	W 17 W C 2	F22ILL	33	0.0	SW	2,000	66	46	0.0	$ 8.02	$ 101.25	$10	12.6	2.0
11	Gym Janitor Closet	2	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	500	72	2	C 28 P F 2	F42SSILL	48	0.1	SW	500	48	24	0.0	$ 6.77	$ 212.50	$20	31.4	8.0
141LED	Wrestling	18	HPS 200	HPS200/1	250	4.5	SW	2912	13,104	18	FXLED78	FXLED78/1	78	1.4	SW	2,912	4,088	9,016	3.1	$ 1,469.25	$ 12,699.00	$180	8.6	1.4
16	Womens Locker Room	33	T 34 R F 2 (MAG)	F42EE	72	2.4	SW	2800	6,653	33	T 28 R F 2	F42SSILL	48	1.6	SW	2,800	4,435	2,218	0.8	$ 363.59	$ 3,786.75	$330	10.4	1.6
16	Womens Locker Room Office	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2400	691	4	T 28 R F 2	F42SSILL	48	0.2	SW	2,400	461	230	0.1	$ 38.76	$ 459.00	$40	11.8	1.8
71	Womens Locker Room Office Bathroom	1	I 60	I60/1	60	0.1	SW	2000	120	1	CF 26	CFQ26/1-L	27	0.0	SW	2,000	54	66	0.0	$ 11.50	$ 6.75	$0	0.6	0.1
11	Womens Sports Locker Room	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2800	605	3	C 28 P F 2	F42SSILL	48	0.1	SW	2,800	403	202	0.1	$ 33.05	$ 318.75	$30	9.6	1.4
16	Womens Sports Locker Room	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2800	202	1	T 28 R F 2	F42SSILL	48	0.0	SW	2,800	134	67	0.0	$ 11.02	$ 114.75	$10	10.4	1.6
16	Womens Locker Room Bathroom	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	288	2	T 28 R F 2	F42SSILL	48	0.1	SW	2,000	192	96	0.0	$ 16.73	$ 229.50	$20	13.7	2.2
20	Womens Locker Room Bathroom	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	128	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2,000	128	-	0.0	$ -	$ -	$0		
39	Gym Womens Bathroom	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	SW	2000	66	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	SW	2,000	66	-	0.0	$ -	$ -	$0		
20	Gym Womens Bathroom	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	256	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2,000	256	-	0.0	$ -	$ -	$0		
16	Gym Womens Bathroom	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	288	2	T 28 R F 2	F42SSILL	48	0.1	SW	2,000	192	96	0.0	$ 16.73	$ 229.50	$20	13.7	2.2
16	Gym Janitor Closet	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	500	36	1	T 28 R F 2	F42SSILL	48	0.0	SW	500	24	12	0.0	$ 3.39	$ 114.75	$10	33.9	8.7
20	Gym Mens Bathroom	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	256	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2,000	256	-	0.0	$ -	$ -	$0		
18	57	25	T 32 R F 4 (ELE)	F44ILL	112	2.8	SW	2400	6,720	25	0	F44SSILL	96	2.4	SW	2,400	5,760	960	0.4	$ 161.51	$ 2,656.25	$250	16.4	2.5
13	57 Side Room	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	500	60	2	0	F42SSILL	48	0.1	SW	500	48	12	0.0	$ 3.39	$ 212.50	$20	62.7	16.0
18	55	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	2400	4,032	15	0	F44SSILL	96	1.4	SW	2,400	3,456	576	0.2	$ 96.91	$ 1,593.75	$150	16.4	2.5
18	58	14	T 32 R F 4 (ELE)	F44ILL	112	1.6	SW	2400	3,763	14	0	F44SSILL	96	1.3	SW	2,400	3,226	538	0.2	$ 90.45	$ 1,487.50	$140	16.4	2.5
18	56	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	54	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	52	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	50	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
141LED	47	18	HPS 200	HPS200/1	250	4.5	SW	2400	10,800	18	FXLED78	FXLED78/1	78	1.4	SW	2,400	3,370	7,430	3.1	$ 1,250.10	$ 12,699.00	$180	10.2	1.7
18	45	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075	4	0	F44SSILL	96	0.4	SW	2,400	922	154	0.1	$ 25.84	$ 425.00	$40	16.4	2.5
141LED	43	6	HPS 200	HPS200/1	250	1.5	SW	2400	3,600	6	FXLED78	FXLED78/1	78	0.5	SW	2,400	1,123	2,477	1.0	$ 416.70	$ 4,233.00	$60	10.2	1.7
13	41	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	SW	2,400	230	58	0.0	$ 9.69	$ 212.50	$20	21.9	3.3
18	39	24	T 32 R F 4 (ELE)	F44ILL	112	2.7	SW	2400	6,451	24	0	F44SSILL	96	2.3	SW	2,400	5,530	922	0.4	$ 155.05	$ 2,550.00	$240	16.4	2.5
18	39 Office	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075	4	0	F44SSILL	96	0.4	SW	2,400	922	154	0.1	$ 25.84	$ 425.00	$40	16.4	2.5
71	39 Closet	4	I 60	I60/1	60	0.2	SW	500	120	4	CF 26	CFQ26/1-L	27	0.1	SW	500	54	66	0.1	$ 18.63	$ 27.00	$0	1.4	0.4
18	Office 2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	2400	269	1	0	F44SSILL	96	0.1	SW	2,400	230	38	0.0	$ 6.46	$ 106.25	$10	16.4	2.5
18	39 Office	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	2400	269	1	0	F44SSILL	96	0.1	SW	2,400	230	38	0.0	$ 6.46	$ 106.25	$10	16.4	2.5
18	37	24	T 32 R F 4 (ELE)	F44ILL	112	2.7	SW	2400	6,451	24	0	F44SSILL	96	2.3	SW	2,400	5,530	922	0.4	$ 155.05	$ 2,550.00	$240	16.4	2.5
20	37 Electrical Panel	6	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	8760	1,682	6	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	8,760	1,682	-	0.0	$ -	$ -	$0		
20	33 Mens Bathroom	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2000	320	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2,000	320	-	0.0	$ -	$ -	$0		
20	33 Womens Bathroom	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2000	320	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2,000	320	-	0.0	$ -	$ -	$0		
18	29	18	T 32 R F 4 (ELE)	F44ILL	112	2.0	SW	2400	4,838	18	0	F44SSILL	96	1.7	SW	2,400	4,147	691	0.3	$ 116.29	$ 1,912.50	$180	16.4	2.5
Y	Exterior	25	I 100	I100/1	100	2.5	SW	4368	10,920	25	CF 26	CFQ26/1-L	27	0.7	SW	4,368	2,948	7,972	1.8	$ 1,233.44	$ 1,012.50	$0	0.8	0.1
142LED	Exterior	17	MH 100	MH100/1	128	2.2	SW	4368	9,505	17	FXLED39	FXLED39/1	39	0.7	SW	4,368	2,896	6,609	1.5	$ 1,022.57	$ 7,624.50	$170	7.5	1.1
169LED	Exterior	1	SP 250 MH ROOF	MH250/1	295	0.3	SW	4368	1,289	1	FXLED78	FXLED78/1	78	0.1	SW	4,368	341	948	0.2	$ 146.66	$ 705.50	$10	4.8	0.7
18	27	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	26	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,301	16	0	F44SSILL	96	1.5	SW	2,400	3,686	614	0.3	$ 103.37	$ 1,700.00	$160	16.4	2.5
18	25	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	24	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	23	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	22	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	21	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
20	20	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2,400	307	-	0.0	$ -	$ -	$0		
18	19	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
18	18	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	SW	2,400	2,304	384	0.2	$ 64.60	$ 1,062.50	$100	16.4	2.5
S	**Total**	**1,103**				**130.9**			**331,794**	**1,103**			**7,854**	**92.7**			**231,247**	**100,546**	**38.1**	**$16,646**	**$174,490**	**$11,080**		

Energy Audit of Penns Grove High School

CHA Project No. 24510

ECM-2 Install Occupancy Sensors

Cost of Electricity: **$0.138 $/kWh**

$6.00 $/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
18	109	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,225.6	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	C-OCC	1680	2,257.9	967.7	0.0	$133.78	$202.50	$35.00	1.5	1.3
18	111	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,225.6	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	C-OCC	1680	2,257.9	967.7	0.0	$133.78	$202.50	$35.00	1.5	1.3
13	113	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720.0	5	S 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	1680	504.0	216.0	0.0	$29.86	$202.50	$35.00	6.8	5.6
18	107	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,225.6	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	C-OCC	1680	2,257.9	967.7	0.0	$133.78	$202.50	$35.00	1.5	1.3
3	Boys Bathroom	5	W 34 W F 1 (MAG)	F41EE	43	0.2	SW	2000	430.0	5	W 34 W F 1 (MAG)	F41EE	43	0.2	NONE	2000	430.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
3	Girls Bathroom	5	W 34 W F 1 (MAG)	F41EE	43	0.2	SW	2000	430.0	5	W 34 W F 1 (MAG)	F41EE	43	0.2	NONE	2000	430.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18	105	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	104	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,225.6	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	C-OCC	1680	2,257.9	967.7	0.0	$133.78	$202.50	$35.00	1.5	1.3
18	103	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
20	102	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	215.0	92.2	0.0	$12.74	$202.50	$35.00	15.9	13.1
18	101	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	100	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,225.6	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	C-OCC	1680	2,257.9	967.7	0.0	$133.78	$202.50	$35.00	1.5	1.3
18	99	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
20	98	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	215.0	92.2	0.0	$12.74	$202.50	$35.00	15.9	13.1
18	97	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	96	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	94	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2400	2,419.2	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	C-OCC	1680	1,693.4	725.8	0.0	$100.34	$202.50	$35.00	2.0	1.7
18	95	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	Assistant Principle	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	2400	1,612.8	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	C-OCC	1200	806.4	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	93	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	91	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	90	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,300.8	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	C-OCC	1680	3,010.6	1,290.2	0.0	$178.38	$202.50	$35.00	1.1	0.9
16	Janitor Closet	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	500	36.0	1	T 34 R F 2 (MAG)	F42EE	72	0.1	C-OCC	0	0.0	36.0	0.0	$4.98	$202.50	$35.00	40.7	33.7
18	Library	48	T 32 R F 4 (ELE)	F44ILL	112	5.4	SW	2400	12,902.4	48	T 32 R F 4 (ELE)	F44ILL	112	5.4	C-OCC	1680	9,031.7	3,870.7	0.0	$535.13	$202.50	$35.00	0.4	0.3
16	Athletic Director	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2400	691.2	4	T 34 R F 2 (MAG)	F42EE	72	0.3	C-OCC	1200	345.6	345.6	0.0	$47.78	$202.50	$35.00	4.2	3.5
16	87A,B	20	T 34 R F 2 (MAG)	F42EE	72	1.4	SW	2400	3,456.0	20	T 34 R F 2 (MAG)	F42EE	72	1.4	C-OCC	1680	2,419.2	1,036.8	0.0	$143.34	$202.50	$35.00	1.4	1.2
3	Mens Locker Room	32	W 34 W F 1 (MAG)	F41EE	43	1.4	SW	2800	3,852.8	32	W 34 W F 1 (MAG)	F41EE	43	1.4	NONE	2000	2,752.0	1,100.8	0.0	$152.19	$0.00	$0.00	0.0	0.0
20	Mens Locker Room	8	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2800	716.8	8	S 32 C F 1 (ELE)	F41LL	32	0.3	NONE	2000	512.0	204.8	0.0	$28.31	$0.00	$0.00	0.0	0.0
11	Gym Electrical Room	2	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	8760	1,261.4	2	S 34 P F 2 (MAG)	F42EE	72	0.1	C-OCC	0	0.0	1,261.4	0.0	$174.40	$202.50	$35.00	1.2	1.0
18	73	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,300.8	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	C-OCC	1680	3,010.6	1,290.2	0.0	$178.38	$202.50	$35.00	1.1	0.9
13	71	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144.0	1	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1680	100.8	43.2	0.0	$5.97	$202.50	$35.00	33.9	28.0
39	71	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	SW	2400	79.2	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	C-OCC	1680	55.4	23.8	0.0	$3.28	$202.50	$35.00	61.6	51.0
18	69	21	T 32 R F 4 (ELE)	F44ILL	112	2.4	SW	2400	5,644.8	21	T 32 R F 4 (ELE)	F44ILL	112	2.4	C-OCC	1680	3,951.4	1,693.4	0.0	$234.12	$202.50	$35.00	0.9	0.7
20	67	24	S 32 C F 1 (ELE)	F41LL	32	0.8	SW	2400	1,843.2	24	S 32 C F 1 (ELE)	F41LL	32	0.8	C-OCC	1680	1,290.2	553.0	0.0	$76.45	$202.50	$35.00	2.6	2.2
141LED	63 - Cafeteria	28	HPS 200	HPS200/1	250	7.0	SW	1600	11,200.0	28	HPS 200	HPS200/1	250	7.0	NONE	1200	8,400.0	2,800.0	0.0	$387.10	$0.00	$0.00	0.0	0.0
18	59	14	T 32 R F 4 (ELE)	F44ILL	112	1.6	SW	2400	3,763.2	14	T 32 R F 4 (ELE)	F44ILL	112	1.6	C-OCC	1680	2,634.2	1,129.0	0.0	$156.08	$202.50	$35.00	1.3	1.1
115	61 - Bathroom	1	W 20 C F 2	F22SS	56	0.1	SW	2000	112.0	1	W 20 C F 2	F22SS	56	0.1	NONE	2000	112.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
11	Gym Janitor Closet	2	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	500	72.0	2	S 34 P F 2 (MAG)	F42EE	72	0.1	C-OCC	0	0.0	72.0	0.0	$9.95	$202.50	$35.00	20.3	16.8
141LED	Wrestling	18	HPS 200	HPS200/1	250	4.5	SW	2912	13,104.0	18	HPS 200	HPS200/1	250	4.5	C-OCC	2912	13,104.0	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
16	Womens Locker Room	33	T 34 R F 2 (MAG)	F42EE	72	2.4	SW	2800	6,652.8	33	T 34 R F 2 (MAG)	F42EE	72	2.4	NONE	2000	4,752.0	1,900.8	0.0	$262.79	$0.00	$0.00	0.0	0.0
16	Womens Locker Room Office	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2400	691.2	4	T 34 R F 2 (MAG)	F42EE	72	0.3	C-OCC	1200	345.6	345.6	0.0	$47.78	$202.50	$35.00	4.2	3.5
71	Womens Locker Room Office Bathroom	1	I 60	I60/1	60	0.1	SW	2000	120.0	1	I 60	I60/1	60	0.1	NONE	2000	120.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
11	Womens Sports Locker Room	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2800	604.8	3	S 34 P F 2 (MAG)	F42EE	72	0.2	NONE	2000	432.0	172.8	0.0	$23.89	$0.00	$0.00	0.0	0.0
16	Womens Sports Locker Room	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2800	201.6	1	T 34 R F 2 (MAG)	F42EE	72	0.1	NONE	2000	144.0	57.6	0.0	$7.96	$0.00	$0.00	0.0	0.0
16	Womens Locker Room Bathroom	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	288.0	2	T 34 R F 2 (MAG)	F42EE	72	0.1	NONE	2000	288.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
20	Womens Locker Room Bathroom	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	128.0	2	S 32 C F 1 (ELE)	F41LL	32	0.1	NONE	2000	128.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
39	Gym Womens Bathroom	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	SW	2000	66.0	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	NONE	2000	66.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
20	Gym Womens Bathroom	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	256.0	4	S 32 C F 1 (ELE)	F41LL	32	0.1	NONE	2000	256.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
16	Gym Womens Bathroom	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	288.0	2	T 34 R F 2 (MAG)	F42EE	72	0.1	NONE	2000	288.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
16	Gym Janitor Closet	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	500	36.0	1	T 34 R F 2 (MAG)	F42EE	72	0.1	C-OCC	0	0.0	36.0	0.0	$4.98	$202.50	$35.00	40.7	33.7
20	Gym Mens Bathroom	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	256.0	4	S 32 C F 1 (ELE)	F41LL	32	0.1	NONE	2000	256.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18	57	25	T 32 R F 4 (ELE)	F44ILL	112	2.8	SW	2400	6,720.0	25	T 32 R F 4 (ELE)	F44ILL	112	2.8	C-OCC	1680	4,704.0	2,016.0	0.0	$278.71	$202.50	$35.00	0.7	0.6
13	57 Side Room	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	500	60.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	0	0.0	60.0	0.0	$8.30	$202.50	$35.00	24.4	20.2
18	55	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	2400	4,032.0	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	C-OCC	1680	2,822.4	1,209.6	0.0	$167.23	$202.50	$35.00	1.2	1.0
18	58	14	T 32 R F 4 (ELE)	F44ILL	112	1.6	SW	2400	3,763.2	14	T 32 R F 4 (ELE)	F44ILL	112	1.6	C-OCC	1680	2,634.2	1,129.0	0.0	$156.08	$202.50	$35.00	1.3	1.1
18	56	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	54	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	52	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	50	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
141LED	47	18	HPS 200	HPS200/1	250	4.5	SW	2400	10,800.0	18	HPS 200	HPS200/1	250	4.5	C-OCC	1680	7,560.0	3,240.0	0.0	$447.93	$202.50	$35.00	0.5	0.4
18	45	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075.2	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1680	752.6	322.6	0.0	$44.59	$202.50	$35.00	4.5	3.8
141LED	43	6	HPS 200	HPS200/1	250	1.5	SW	2400	3,600.0	6	HPS 200	HPS200/1	250	1.5	C-OCC	1680	2,520.0	1,080.0	0.0	$149.31	$202.50	$35.00	1.4	1.1
13	41	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	S 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1680	201.6	86.4	0.0	$11.94	$202.50	$35.00	17.0	14.0
18	39	24	T 32 R F 4 (ELE)	F44ILL	112	2.7	SW	2400	6,451.2	24	T 32 R F 4 (ELE)	F44ILL	112	2.7	C-OCC	1680	4,515.8	1,935.4	0.0	$267.57	$202.50	$35.00	0.8	0.6
18	39 Office	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075.2	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1200	537.6	537.6	0.0	$74.32	$202.50	$35.00	2.7	2.3
71	39 Closet	4	I 60	I60/1	60	0.2	SW	500	120.0	4	I 60	I60/1	60	0.2	C-OCC	0	0.0	120.0	0.0	$16.59	$202.50	$35.00	12.2	10.1
18	Office 2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	2400	268.8	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	1200	134.4	134.4	0.0	$18.58	$202.50	$35.00	10.9	9.0
18	39 Office	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	2400	268.8	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	1200	134.4	134.4	0.0	$18.58	$202.50	$35.00	10.9	9.0
18	37	24	T 32 R F 4 (ELE)	F44ILL	112	2.7	SW	2400	6,451.2	24	T 32 R F 4 (ELE)	F44ILL	112	2.7	C-OCC	1680	4,515.8	1,935.4	0.0	$267.57	$202.50	$35.00	0.8	0.6
20	37 Electrical Panel	6	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	8760	1,681.9	6	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	0	0.0	1,681.9	0.0	$232.53	$202.50	$35.00	0.9	0.7
20	33 Mens Bathroom	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2000	320.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	NONE	2000	320.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
20	33 Womens Bathroom	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2000	320.0	5	S 32 C F 1 (ELE)	F41LL	32	0.2	NONE	2000	320.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18	29	18	T 32 R F 4 (ELE)	F44ILL	112	2.0	SW	2400	4,838.4	18	T 32 R F 4 (ELE)	F44ILL	112	2.0	C-OCC	1680	3,386.9	1,451.5	0.0	$200.67	$202.50	$35.00	1.0	0.8
Y	Exterior	25	I 100	I100/1	100	2.5	SW	4368	10,920.0	25	I 100	I100/1	100	2.5	C-OCC	4368	10,920.0	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
142LED	Exterior	17	MH 100	MH100/1	128	2.2	SW	4368	9,504.8	17	MH 100	MH100/1	128	2.2	C-OCC	4368	9,504.8	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
169LED	Exterior	1	SP 250 MH ROOF	MH250/1	295	0.3	SW	4368	1,288.6	1	SP 250 MH ROOF	MH250/1	295	0.3	C-OCC	4368	1,288.6	0.0	0.0	$0.00	$202.50	$35.00		#DIV/0!
18	27	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	26	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,300.8	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	C-OCC	1680	3,010.6	1,290.2	0.0	$178.38	$202.50	$35.00	1.1	0.9
18	25	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	24	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	23	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	22	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	21	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
20	20	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307.2	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1680	215.0	92.2	0.0	$12.74	$202.50	$35.00	15.9	13.1
18	19	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
18	18	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688.0	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	C-OCC	1680	1,881.6	806.4	0.0	$111.49	$202.50	$35.00	1.8	1.5
S	**Total**	**1,103**				**130.9**			**331,794**	**1,103**				**131**			**258,705**	**73,089**	**0**	**10,105**	**$17,415**	**3,010**		
S																	**Demand Savings**			**0.0**	**$0**			
S																	**kWh Savings**			**73,089**	**$10,105**			

Energy Audit of Penns Grove High School

CHA Project No. 24510

ECM-2 Install Occupancy Sensors

Cost of Electricity: **$0.138 $/kWh**

$6.00 $/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
S																	**Total Savings**				**$10,105**		**1.7**	**1.4**

Energy Audit of Penns Grove High School

CHA Project No. 24510

ECM-3 Lighting Replacements with Occupancy Sensors

Cost of Electricity: **$0.138 $/kWh**

$6.00 $/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)	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
18	109	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	C-OCC	1,680	1,935	1,290	0.2	$ 192.20	$ 1,477.50	$ 155	7.7	6.9
18	111	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	C-OCC	1,680	1,935	1,290	0.2	$ 192.20	$ 1,477.50	$ 155	7.7	6.9
13	113	5	S 32 P F 2 (ELE)	F42LL	60	0.3	SW	2400	720	5	0	F42SSILL	48	0.2	C-OCC	1,680	403	317	0.1	$ 48.12	$ 733.75	$ 85	15.2	13.5
18	107	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	C-OCC	1,680	1,935	1,290	0.2	$ 192.20	$ 1,477.50	$ 155	7.7	6.9
3	Boys Bathroom	5	W 34 W F 1 (MAG)	F41EE	43	0.2	SW	2000	430	5	W 28 W F 1	F41SSILL	26	0.1	NONE	2,000	260	170	0.1	$ 29.62	$ 875.00	$ 50	29.5	27.9
3	Girls Bathroom	5	W 34 W F 1 (MAG)	F41EE	43	0.2	SW	2000	430	5	W 28 W F 1	F41SSILL	26	0.1	NONE	2,000	260	170	0.1	$ 29.62	$ 875.00	$ 50	29.5	27.9
18	105	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	104	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	C-OCC	1,680	1,935	1,290	0.2	$ 192.20	$ 1,477.50	$ 155	7.7	6.9
18	103	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
20	102	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1,680	215	92	0.0	$ 12.74	$ 202.50	$ 35	15.9	13.1
18	101	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	100	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	2400	3,226	12	0	F44SSILL	96	1.2	C-OCC	1,680	1,935	1,290	0.2	$ 192.20	$ 1,477.50	$ 155	7.7	6.9
18	99	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
20	98	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1,680	215	92	0.0	$ 12.74	$ 202.50	$ 35	15.9	13.1
18	97	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	96	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	94	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2400	2,419	9	0	F44SSILL	96	0.9	C-OCC	1,680	1,452	968	0.1	$ 144.15	$ 1,158.75	$ 125	8.0	7.2
18	95	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	Assistant Principle	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	2400	1,613	6	0	F44SSILL	96	0.6	C-OCC	1,200	691	922	0.1	$ 134.32	$ 840.00	$ 95	6.3	5.5
18	93	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	91	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	90	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,301	16	0	F44SSILL	96	1.5	C-OCC	1,680	2,580	1,720	0.3	$ 256.26	$ 1,902.50	$ 195	7.4	6.7
16	Janitor Closet	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	500	36	1	T 28 R F 2	F42SSILL	48	0.0	C-OCC	-	-	36	0.0	$ 6.70	$ 317.25	$ 45	47.3	40.6
18	Library	48	T 32 R F 4 (ELE)	F44ILL	112	5.4	SW	2400	12,902	48	0	F44SSILL	96	4.6	C-OCC	1,680	7,741	5,161	0.8	$ 768.79	$ 5,302.50	$ 515	6.9	6.2
16	Athletic Director	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2400	691	4	T 28 R F 2	F42SSILL	48	0.2	C-OCC	1,200	230	461	0.1	$ 70.62	$ 661.50	$ 75	9.4	8.3
16	87A,B	20	T 34 R F 2 (MAG)	F42EE	72	1.4	SW	2400	3,456	20	T 28 R F 2	F42SSILL	48	1.0	C-OCC	1,680	1,613	1,843	0.5	$ 289.37	$ 2,497.50	$ 235	8.6	7.8
215	Gym	46	High Bay MH 350	MHPS/SCWA/350/1	400	18.4	SW	2912	53,581	46	F48T5/HO	F44GHL	234	10.8	NONE	2,912	31,345	22,236	7.6	$ 3,623.78	$ 20,125.00	$ 1,610	5.6	5.1
3	Mens Locker Room	32	W 34 W F 1 (MAG)	F41EE	43	1.4	SW	2800	3,853	32	W 28 W F 1	F41SSILL	26	0.8	NONE	2,000	1,664	2,189	0.5	$ 341.76	$ 5,600.00	$ 320	16.4	15.4
20	Mens Locker Room	8	S 32 C F 1 (ELE)	F41LL	32	0.3	SW	2800	717	8	S 32 C F 1 (ELE)	F41LL	32	0.3	NONE	2,000	512	205	0.0	$ 28.31	$ -	$ -	0.0	0.0
11	Gym Electrical Room	2	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	8760	1,261	2	C 28 P F 2	F42SSILL	48	0.1	C-OCC	-	-	1,261	0.0	$ 177.85	$ 415.00	$ 55	2.3	2.0
18	73	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,301	16	0	F44SSILL	96	1.5	C-OCC	1,680	2,580	1,720	0.3	$ 256.26	$ 1,902.50	$ 195	7.4	6.7
18	71	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	2400	4,032	15	0	F44SSILL	96	1.4	C-OCC	1,680	2,419	1,613	0.2	$ 240.25	$ 1,796.25	$ 185	7.5	6.7
13	71	1	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	0	F42SSILL	48	0.0	C-OCC	1,680	81	63	0.0	$ 9.62	$ 308.75	$ 45	32.1	27.4
39	71	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	SW	2400	79	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	C-OCC	1,680	55	24	0.0	$ 3.28	$ 202.50	$ 35	61.6	51.0
18	69	21	T 32 R F 4 (ELE)	F44ILL	112	2.4	SW	2400	5,645	21	0	F44SSILL	96	2.0	C-OCC	1,680	3,387	2,258	0.3	$ 336.34	$ 2,433.75	$ 245	7.2	6.5
20	67	24	S 32 C F 1 (ELE)	F41LL	32	0.8	SW	2400	1,843	24	S 32 C F 1 (ELE)	F41LL	32	0.8	C-OCC	1,680	1,290	553	0.0	$ 76.45	$ 202.50	$ 35	2.6	2.2
16	65	20	T 34 R F 2 (MAG)	F42EE	72	1.4	SW	2400	3,456	20	T 28 R F 2	F42SSILL	48	1.0	C-OCC	1,680	1,613	1,843	0.5	$ 289.37	$ 2,497.50	$ 235	8.6	7.8
141LED	63 - Cafeteria	28	HPS 200	HPS200/1	250	7.0	SW	1600	11,200	28	FXLED78	FXLED78/1	78	2.2	NONE	1,200	2,621	8,579	4.8	$ 1,532.73	$ 19,754.00	$ 280	12.9	12.7
18	59	14	T 32 R F 4 (ELE)	F44ILL	112	1.6	SW	2400	3,763	14	0	F44SSILL	96	1.3	C-OCC	1,680	2,258	1,505	0.2	$ 224.23	$ 1,690.00	$ 175	7.5	6.8
20	61	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	154	2	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1,680	108	46	0.0	$ 6.37	$ 202.50	$ 35	31.8	26.3
115	61 - Bathroom	1	W 20 C F 2	F22SS	56	0.1	SW	2000	112	1	W 17 W C 2	F22ILL	33	0.0	NONE	2,000	66	46	0.0	$ 8.02	$ 101.25	$ 10	12.6	11.4
16	Gym Mens Bathroom	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	288	2	T 28 R F 2	F42SSILL	48	0.1	NONE	2,000	192	96	0.0	$ 16.73	$ 229.50	$ 20	13.7	12.5
11	Gym Janitor Closet	2	S 34 P F 2 (MAG)	F42EE	72	0.1	SW	500	72	2	C 28 P F 2	F42SSILL	48	0.1	C-OCC	-	-	72	0.0	$ 13.41	$ 415.00	$ 55	30.9	26.8
11	Gym Accent	20	S 34 P F 2 (MAG)	F42EE	72	1.4	SW	2912	4,193	20	C 28 P F 2	F42SSILL	48	1.0	C-OCC	2,912	2,796	1,398	0.5	$ 227.79	$ 2,327.50	$ 235	10.2	9.2
141LED	Wrestling	18	HPS 200	HPS200/1	250	4.5	SW	2912	13,104	18	FXLED78	FXLED78/1	78	1.4	C-OCC	2,912	4,088	9,016	3.1	$ 1,469.25	$ 12,901.50	$ 215	8.8	8.6
11	Equipment Room	6	S 34 P F 2 (MAG)	F42EE	72	0.4	SW	2800	1,210	6	C 28 P F 2	F42SSILL	48	0.3	C-OCC	2,000	576	634	0.1	$ 97.96	$ 840.00	$ 95	8.6	7.6
16	Womens Locker Room	33	T 34 R F 2 (MAG)	F42EE	72	2.4	SW	2800	6,653	33	T 28 R F 2	F42SSILL	48	1.6	NONE	2,000	3,168	3,485	0.8	$ 538.78	$ 3,786.75	$ 330	7.0	6.4
16	Womens Locker Room Office	4	T 34 R F 2 (MAG)	F42EE	72	0.3	SW	2400	691	4	T 28 R F 2	F42SSILL	48	0.2	C-OCC	1,200	230	461	0.1	$ 70.62	$ 661.50	$ 75	9.4	8.3
96	Womens Locker Room Office Bathroom	2	W 17 C F 2	F22ILL	33	0.1	SW	2000	132	2	W 17 C F 2	F22ILL	33	0.1	NONE	2,000	132	-	0.0	$ -	$ -	$ -	-	
71	Womens Locker Room Office Bathroom	1	I 60	I60/1	60	0.1	SW	2000	120	1	CF 26	CFQ26/1-L	27	0.0	NONE	2,000	54	66	0.0	$ 11.50	$ 6.75	$ -	0.6	0.6
11	Womens Sports Locker Room	3	S 34 P F 2 (MAG)	F42EE	72	0.2	SW	2800	605	3	C 28 P F 2	F42SSILL	48	0.1	NONE	2,000	288	317	0.1	$ 48.98	$ 318.75	$ 30	6.5	5.9
16	Womens Sports Locker Room	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2800	202	1	T 28 R F 2	F42SSILL	48	0.0	NONE	2,000	96	106	0.0	$ 16.33	$ 114.75	$ 10	7.0	6.4
16	Womens Locker Room Bathroom	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	288	2	T 28 R F 2	F42SSILL	48	0.1	NONE	2,000	192	96	0.0	$ 16.73	$ 229.50	$ 20	13.7	12.5
20	Womens Locker Room Bathroom	2	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	128	2	S 32 C F 1 (ELE)	F41LL	32	0.1	NONE	2,000	128	-	0.0	$ -	$ -	$ -		
39	Gym Womens Bathroom	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	SW	2000	66	1	2' 17 W F 2 (ELE)	F22ILL	33	0.0	NONE	2,000	66	-	0.0	$ -	$ -	$ -		
20	Gym Womens Bathroom	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	256	4	S 32 C F 1 (ELE)	F41LL	32	0.1	NONE	2,000	256	-	0.0	$ -	$ -	$ -		
16	Gym Womens Bathroom	2	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	2000	288	2	T 28 R F 2	F42SSILL	48	0.1	NONE	2,000	192	96	0.0	$ 16.73	$ 229.50	$ 20	13.7	12.5
16	Gym Janitor Closet	1	T 34 R F 2 (MAG)	F42EE	72	0.1	SW	500	36	1	T 28 R F 2	F42SSILL	48	0.0	C-OCC	-	-	36	0.0	$ 6.70	$ 317.25	$ 45	47.3	40.6
20	Gym Mens Bathroom	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2000	256	4	S 32 C F 1 (ELE)	F41LL	32	0.1	NONE	2,000	256	-	0.0	$ -	$ -	$ -		
18	57	25	T 32 R F 4 (ELE)	F44ILL	112	2.8	SW	2400	6,720	25	0	F44SSILL	96	2.4	C-OCC	1,680	4,032	2,688	0.4	$ 400.41	$ 2,858.75	$ 285	7.1	6.4
13	57 Side Room	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	500	60	2	0	F42SSILL	48	0.1	C-OCC	-	-	60	0.0	$ 10.02	$ 415.00	$ 55	41.4	35.9
18	55	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	2400	4,032	15	0	F44SSILL	96	1.4	C-OCC	1,680	2,419	1,613	0.2	$ 240.25	$ 1,796.25	$ 185	7.5	6.7
18	58	14	T 32 R F 4 (ELE)	F44ILL	112	1.6	SW	2400	3,763	14	0	F44SSILL	96	1.3	C-OCC	1,680	2,258	1,505	0.2	$ 224.23	$ 1,690.00	$ 175	7.5	6.8
18	56	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	54	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	52	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	50	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
141LED	47	18	HPS 200	HPS200/1	250	4.5	SW	2400	10,800	18	FXLED78	FXLED78/1	78	1.4	C-OCC	1,680	2,359	8,441	3.1	$ 1,389.86	$ 12,901.50	$ 215	9.3	9.1
18	45	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075	4	0	F44SSILL	96	0.4	C-OCC	1,680	645	430	0.1	$ 64.07	$ 627.50	$ 75	9.8	8.6
141LED	43	6	HPS 200	HPS200/1	250	1.5	SW	2400	3,600	6	FXLED78	FXLED78/1	78	0.5	C-OCC	1,680	786	2,814	1.0	$ 463.29	$ 4,435.50	$ 95	9.6	9.4
18	57 Back Side Room	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	500	224	4	0	F44SSILL	96	0.4	C-OCC	-	-	224	0.1	$ 35.57	$ 627.50	$ 75	17.6	15.5
13	41	2	S 32 P F 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	0	F42SSILL	48	0.1	C-OCC	1,680	161	127	0.0	$ 19.25	$ 415.00	$ 55	21.6	18.7
18	39	24	T 32 R F 4 (ELE)	F44ILL	112	2.7	SW	2400	6,451	24	0	F44SSILL	96	2.3	C-OCC	1,680	3,871	2,580	0.4	$ 384.39	$ 2,752.50	$ 275	7.2	6.4
18	39 Office	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075	4	0	F44SSILL	96	0.4	C-OCC	1,200	461	614	0.1	$ 89.55	$ 627.50	$ 75	7.0	6.2
71	39 Closet	4	I 60	I60/1	60	0.2	SW	500	120	4	CF 26	CFQ26/1-L	27	0.1	C-OCC	-	-	120	0.1	$ 26.09	$ 229.50	$ 35	8.8	7.5
18	Office 2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	2400	269	1	0	F44SSILL	96	0.1	C-OCC	1,200	115	154	0.0	$ 22.39	$ 308.75	$ 45	13.8	11.8
18	39 Office	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	2400	269	1	0	F44SSILL	96	0.1	C-OCC	1,200	115	154	0.0	$ 22.39	$ 308.75	$ 45	13.8	11.8
18	37	24	T 32 R F 4 (ELE)	F44ILL	112	2.7	SW	2400	6,451	24	0	F44SSILL	96	2.3	C-OCC	1,680	3,871	2,580	0.4	$ 384.39	$ 2,752.50	$ 275	7.2	6.4
20	37 Electrical Panel	6	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	8760	1,682	6	S 32 C F 1 (ELE)	F41LL	32	0.2	C-OCC	-	-	1,682	0.0	$ 232.53	$ 202.50	$ 35	0.9	0.7
18	33	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
20	33 Mens Bathroom	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2000	320	5	S 32 C F 1 (ELE)	F41LL	32	0.2	NONE	2,000	320	-	0.0	$ -	$ -	$ -		
20	33 Womens Bathroom	5	S 32 C F 1 (ELE)	F41LL	32	0.2	SW	2000	320	5	S 32 C F 1 (ELE)	F41LL	32	0.2	NONE	2,000	320	-	0.0	$ -	$ -	$ -		
18	29	18	T 32 R F 4 (ELE)	F44ILL	112	2.0	SW	2400	4,838	18	0	F44SSILL	96	1.7	C-OCC	1,680	2,903	1,935	0.3	$ 288.30	$ 2,115.00	$ 215	7.3	6.6
Y	Exterior	25	I 100	I100/1	100	2.5	SW	4368	10,920	25	CF 26	CFQ26/1-L	27	0.7	C-OCC	4,368	2,948	7,972	1.8	$ 1,233.44	$ 1,215.00	$ 35	1.0	1.0
142LED	Exterior	17	MH 100	MH100/1	128	2.2	SW	4368	9,505	17	FXLED39	FXLED39/1	39	0.7	C-OCC	4,368	2,896	6,609	1.5	$ 1,022.57	$ 7,827.00	$ 205	7.7	7.5
169LED	Exterior	1	SP 250 MH ROOF	MH250/1	295	0.3	SW	4368	1,289	1	FXLED78	FXLED78/1	78	0.1	C-OCC	4,368	341	948	0.2	$ 146.66	$ 908.00	$ 45	6.2	5.9
18	27	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	26	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	2400	4,301	16	0	F44SSILL	96	1.5	C-OCC	1,680	2,580	1,720	0.3	$ 256.26	$ 1,902.50	$ 195	7.4	6.7
18	25	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	24	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	23	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1

Energy Audit of Penns Grove High School

CHA Project No. 24510 **Cost of Electricity:** **$0.138 $/kWh**

ECM-3 Lighting Replacements with Occupancy Sensors **$6.00 $/kW**

Field Code	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
		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	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
18	22	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	21	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
20	20	4	S 32 C F 1 (ELE)	F41LL	32	0.1	SW	2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1,680	215	92	0.0	$ 12.74	$ 202.50	$ 35	15.9	13.1
18	19	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	18	10	T 32 R F 4 (ELE)	F44ILL	112	1.1	SW	2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	17	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	16	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	15	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	14	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	13	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
20	12	4	S 32 C F 1 (ELE)	F41LL	32	0.1		2400	307	4	S 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1,680	215	92	0.0	$ 12.74	$ 202.50	$ 35	15.9	13.1
18	11	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	9	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	8	8	T 32 R F 4 (ELE)	F44ILL	112	0.9		2400	2,150	8	0	F44SSILL	96	0.8	C-OCC	1,680	1,290	860	0.1	$ 128.13	$ 1,052.50	$ 115	8.2	7.3
18	7	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
18	6	10	T 32 R F 4 (ELE)	F44ILL	112	1.1		2400	2,688	10	0	F44SSILL	96	1.0	C-OCC	1,680	1,613	1,075	0.2	$ 160.16	$ 1,265.00	$ 135	7.9	7.1
3	Boys Bathroom	5	W 34 W F 1 (MAG)	F41EE	43	0.2		2000	430	5	W 28 W F 1	F41SSILL	26	0.1	NONE	2,000	260	170	0.1	$ 29.62	$ 875.00	$ 50	29.5	27.9
3	Girls Bathroom	5	W 34 W F 1 (MAG)	F41EE	43	0.2		2000	430	5	W 28 W F 1	F41SSILL	26	0.1	NONE	2,000	260	170	0.1	$ 29.62	$ 875.00	$ 50	29.5	27.9
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S	**Total**	**1,103**				**130.9**			**331,794**	**1,103**				**92.7**			**173,686**		**38.1**	**24,604**	**191,905**	**$14,090**		
S																	**Demand Savings**			**38.1**	**$2,745**			
S																	**kWh Savings**			**158,108**	**$21,859**			
S																	**Total Savings**				**$24,604**		**7.8**	**7.2**

APPENDIX D

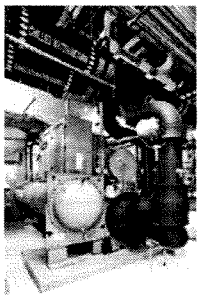
New Jersey Pay For Performance Incentive Program

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)	166,000
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)	$137,180	$62,625
Existing Usage (from utility)	992,250	62,862
Proposed Savings	236,162	2,174
Existing Total MMBtus	9,673	
Proposed Savings MMBtus	1,023	
% Energy Reduction	**10.6%**	
Proposed Annual Savings	$33,100	

	Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm
Incentive #2	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.00	$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 $		
10.6%	Elec	Gas	Total
Incentive #1	$0	$0	$8,300
Incentive #2	$0	$0	$0
Incentive #3	$0	$0	$0
Total All Incentives	**$0**	**$0**	**$8,300**

Total Project Cost	$262,322

		Allowable Incentive
% Incentives #1 of Utility Cost*	4.2%	$8,300
% Incentives #2 of Project Cost**	0.0%	$0
% Incentives #3 of Project Cost**	0.0%	$0
Total Eligible Incentives***	**$8,300**	
Project Cost w/ Incentives	$254,022	

Project Payback (years)	
w/o Incentives	w/ Incentives
7.9	7.7

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

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

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

APPENDIX E

Energy Savings Improvement Plan (ESIP)

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
Penns Grove High School

Cost of Electricity	$0.138	/kWh
Electricity Usage	992,250	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
$2,120,000	**530.0**	**696,280**	**0**	**$96,087**	**0**	**$96,087**	**$0**	**$41,777**	**22.1**	**15.4**

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

Area Output*
10,850 m2
116,791 ft2

Perimeter Output*
1,166 m
3,825 ft

Available Roof Space for PV:
(Area Output - 10 ft x Perimeter) x 85%
66,758 ft2

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

8	watt/ft2	
534,067	DC watts	
530	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
696,280 annual kWh calculated in PV Watts program

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

% Offset Calc

Usage	992,250	(from utilities)
PV Generation	696,280	(generated using PV Watts)
% offset	70%	

AC Energy & Cost Savings

Cautions for Interpreting the Results

Penns Grove High 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:	530.0 kW
DC to AC Derate Factor:	0.830
AC Rating:	439.9 kW
Array Type:	Fixed Tilt
Array Tilt:	20.0 °
Array Azimuth:	180.0 °

Energy Specifications

Cost of Electricity:	13.8 ¢/kWh

Results

Month	Solar Radiation (kWh/m²/day)	AC Energy (kWh)	Energy Value ($)
1	2.80	38437	5304.31
2	3.53	44235	6104.43
3	4.96	66238	9140.84
4	5.39	67830	9360.54
5	5.96	75405	10405.89
6	6.25	74232	10244.02
7	5.95	72323	9980.57
8	5.75	69669	9614.32
9	5.17	62062	8564.56
10	4.19	53988	7450.34
11	2.96	37929	5234.20
12	2.55	33934	4682.89
Year	4.63	696280	96086.64

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

Disclaimer and copyright notice.

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

APPENDIX G

EPA Portfolio Manager

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Penns Grove High School

Building ID: 3242187
For 12-month Period Ending: June 30, 2012[1]
Date SEP becomes ineligible: N/A

Date SEP Generated: August 30, 2012

Facility
Penns Grove High School
334 Harding Highway
Carneys Point, NJ 08069

Facility Owner
N/A

Primary Contact for this Facility
N/A

Year Built: 1971
Gross Floor Area (ft²): 166,000

Energy Performance Rating[2] (1-100) 71

Site Energy Use Summary[3]	
Electricity - Grid Purchase(kBtu)	3,385,557
Natural Gas (kBtu)[4]	5,324,140
Total Energy (kBtu)	8,709,697

Energy Intensity[4]	
Site (kBtu/ft²/yr)	52
Source (kBtu/ft²/yr)	102

Emissions (based on site energy use)	
Greenhouse Gas Emissions ($MtCO_2e$/year)	763

Electric Distribution Utility
Atlantic City Electric Co [Pepco Holdings Inc]

National Median Comparison	
National Median Site EUI	64
National Median Source EUI	125
% Difference from National Median Source EUI	-18%
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	Penns Grove High 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	334 Harding Highway, Carneys Point, NJ 08069	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.		☐
Penns Grove High School (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	166,000 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	80	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	1	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
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?	Yes	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 (0372 4399 9994) (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	97,500.00
05/01/2012	05/31/2012	88,500.00
04/01/2012	04/30/2012	87,000.00
03/01/2012	03/31/2012	87,000.00
02/01/2012	02/29/2012	87,000.00
01/01/2012	01/31/2012	91,500.00
12/01/2011	12/31/2011	82,500.00
11/01/2011	11/30/2011	90,000.00
10/01/2011	10/31/2011	90,000.00
09/01/2011	09/30/2011	55,500.00
08/01/2011	08/31/2011	61,500.00
07/01/2011	07/31/2011	74,250.00
Electric (0372 4399 9994) Consumption (kWh (thousand Watt-hours))		**992,250.00**
Electric (0372 4399 9994) Consumption (kBtu (thousand Btu))		**3,385,557.00**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**3,385,557.00**
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	109.92
05/01/2012	05/31/2012	111.94
04/01/2012	04/30/2012	0.00
03/01/2012	03/31/2012	115.70
02/01/2012	02/29/2012	109.39
01/01/2012	01/31/2012	98.98
12/01/2011	12/31/2011	103.32
11/01/2011	11/30/2011	119.36
10/01/2011	10/31/2011	80.57
09/01/2011	09/30/2011	28.11

08/01/2011	08/31/2011	30.07
07/01/2011	07/31/2011	49.82
Gas Meter Consumption (therms)		**957.18**
Gas Meter Consumption (kBtu (thousand Btu))		**95,718.00**

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

Start Date	End Date	Energy Use (therms)
06/01/2012	06/30/2012	29.04
05/01/2012	05/31/2012	0.00
04/01/2012	04/30/2012	0.00
03/01/2012	03/31/2012	0.00
02/01/2012	02/29/2012	0.00
01/01/2012	01/31/2012	0.00
12/01/2011	12/31/2011	0.00
11/01/2011	11/30/2011	0.00
10/01/2011	10/31/2011	0.00
09/01/2011	09/30/2011	3.12
08/01/2011	08/31/2011	0.00
07/01/2011	07/31/2011	0.00
Gas Meter (Greenhs) Consumption (therms)		**32.16**
Gas Meter (Greenhs) Consumption (kBtu (thousand Btu))		**3,216.00**

Meter: Gas Meter (Carneys Pt/Penns Grove HS) (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
06/01/2012	06/30/2012	808.86
05/01/2012	05/31/2012	4,909.06
04/01/2012	04/30/2012	0.00
03/01/2012	03/31/2012	12,251.38
02/01/2012	02/29/2012	15,397.44
01/01/2012	01/31/2012	8,949.08
12/01/2011	12/31/2011	6,311.91
11/01/2011	11/30/2011	3,333.96
10/01/2011	10/31/2011	82.64
09/01/2011	09/30/2011	62.46
08/01/2011	08/31/2011	51.85
07/01/2011	07/31/2011	93.42
Gas Meter (Carneys Pt/Penns Grove HS) Consumption (therms)		**52,252.06**
Gas Meter (Carneys Pt/Penns Grove HS) Consumption (kBtu (thousand Btu))		**5,225,206.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**5,324,140.00**
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
Penns Grove High School
334 Harding Highway
Carneys Point, NJ 08069

Facility Owner
N/A

Primary Contact for this Facility
N/A

General Information

Penns Grove High School	
Gross Floor Area Excluding Parking: (ft²)	166,000
Year Built	1971
For 12-month Evaluation Period Ending Date:	June 30, 2012

Facility Space Use Summary

Penns Grove High School	
Space Type	K-12 School
Gross Floor Area (ft²)	166,000
Open Weekends?	No
Number of PCs	80
Number of walk-in refrigeration/freezer units	1
Presence of cooking facilities	Yes
Percent Cooled	0
Percent Heated	100
Months °	10
High School?	Yes
School District °	Penns Grov-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	71	71	75	N/A	50
Energy Intensity					
Site (kBtu/ft²)	52	52	50	N/A	64
Source (kBtu/ft²)	102	102	97	N/A	125
Energy Cost					
$/year	$ 191,267.92	$ 191,267.92	$ 183,175.40	N/A	$ 234,245.79
$/ft²/year	$ 1.15	$ 1.15	$ 1.10	N/A	$ 1.41
Greenhouse Gas Emissions					
$MtCO_2e$/year	763	763	731	N/A	934
$kgCO_2e/ft^2$/year	5	5	5	N/A	6

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

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