PITTSGROVE TOWNSHIP SCHOOL DISTRICT

ARTHUR P. SCHALICK HIGH SCHOOL

718 Centerton Road, Pittsgrove, NJ 08318

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

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CHA PROJECT NO. 28484

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REPORT DISCLAIMER

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

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

List of Common Energy Audit Abbreviations

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

1.0 EXECUTIVE SUMMARY

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

Building Name	Address	Square Feet	Construction Date
Arthur P. Schalick High School	718 Centerton Road, Pittsgrove, NJ 08318	112,000	1976

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

Building Name	Electric Savings (kWh)	NG Savings (therms)	Total Savings ($)	Payback (years)
Arthur P. Schalick High School	213,924	5,531	$37,153	14.8

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

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

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

Summary of Energy Conservation Measures

ECM #	Energy Conservation Measure	Est. Costs ($)	Est. Savings ($/year)	Payback w/o Incentive	Potential Incentive ($)*	Payback w/ Incentive	Recommended
ECM-1	Replace the Boiler with a Condensing Boiler	170,451	4,197	40.6	5,250	39.4	Y
ECM-2	Replace Cooling Towers with a VFD Cooling Tower	67,857	7,352	9.2	0	9.2	Y
ECM-3	Convert Water Source Heat Pump Loop to Ground Source Loop	880,890	37,329	23.6	49,200	22.3	N
ECM-4	Install Demand Control Ventilation on RTUs	12,700	171	74.1	200	73.0	Y
ECM-5	Replace One Electric DHW Heater with a Condensing Gas Fired Heater	16,354	903	18.1	2,040	15.8	Y
ECM-6	Kitchen Hood Control	27,951	2,824	9.9	0	9.9	Y
ECM-7	Walk-in Cooler & Freezer EC Motor Retrofits	20,625	1,363	15.1	225	15.0	Y
ECM-8	Install Vending Misers	840	1,137	0.7	0	0.7	Y
ECM-L1**	Lighting Replacements / Upgrades	207,981	15,409	13.5	22,840	12.0	N
ECM-L2**	Install Lighting Controls (Add Occupancy Sensors)	24,570	5,249	4.7	3,185	4.1	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	232,551	19,206	12.1	26,025	10.8	Y
	Total**	1,430,220	74,482	19.2	82,940	18.1	
	Total (Recommended)	549,330	37,153	14.8	33,740	13.9	

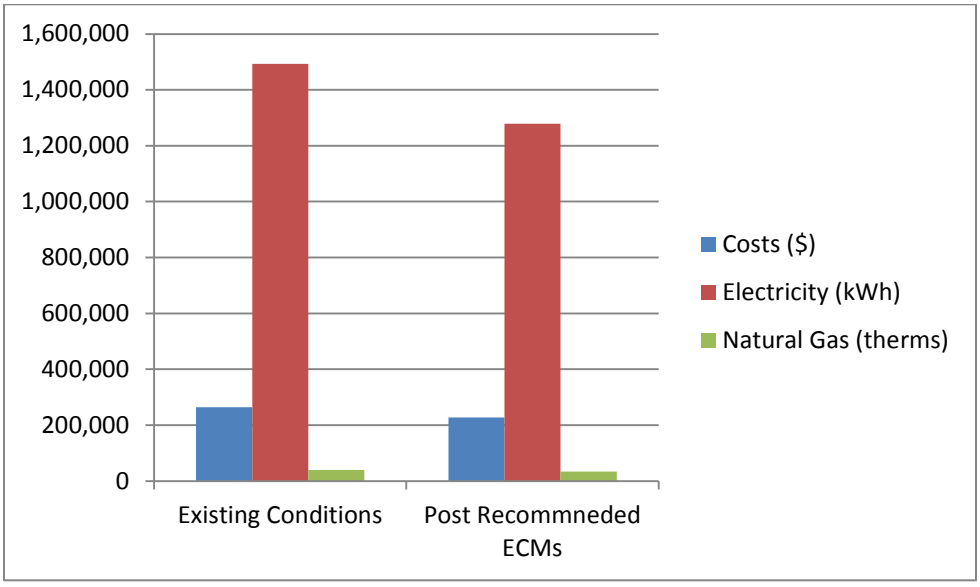
* Incentive shown is per the New Jersey SmartStart Program.
** These ECMs are not included in the Total, as they are alternate measures not recommended.

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

- Photovoltaic (PV) Rooftop Solar Power Generation – 246.4 kW System

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	264,109	226,956	14%
Electricity (kWh)	1,492,963	1,279,039	14%
Natural Gas (therms)	39,423	33,892	14%
Site EUI (kbtu/SF/Yr)	80.7	69.2	



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

2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

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

Building Name: Arthur P. Schalick High School
Address: 718 Centerton Road, Pittsgrove, NJ 08318
Gross Floor Area: 112,000 Square Feet
Number of Floors: 1
Year Built: 1976

Description of Spaces: Classrooms, offices, cafeteria, kitchen, auditorium, gymnasium, dance studio, weight room, computer lab, storage rooms, toilet rooms and a mechanical room.
Description of Occupancy: The school serves 628 students from 9th to 12th grade. There are about 70 school faculty and staff members.
Number of Computers: The school has approximately 300 desktop and laptop computers.
Building Usage: Hours of operation are 7:20 AM – 2:30 PM Monday through Friday, with various after-school activities until 6:00 PM. Custodians are in the building until 11:00 each night. The cafeteria is used for Church services on Sundays. In general the occupied hours are considered 80 hours per week, 10 months per year.
Construction Materials: The building is constructed of structural steel framing, concrete masonry units (CMU) with brick façade.
Roof: The roof is flat and covered with white rubber membrane. It is believed that the roof is well insulated according to the facility staff. The roof is in good condition and no ECMs associated with roof replacement.
Windows: The windows throughout the building are double pane aluminum framed windows. Windows are in good condition and no ECMs associated with window replacement were evaluated.

Exterior Doors: Exterior doors throughout the school are aluminum frame with double pane safety glass. Sweeps on exterior doors are still in good condition. No door ECMs are evaluated.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: The building is heated by two different types of heating systems: the large rooms such as gymnasium, cafeteria and library are heated by individual packaged roof top units (RTU) equipped with gas fired furnaces; the classrooms, offices and hallways are heated by water source heat pumps. The heating capacities of the RTUs are listed as follows:

Manufacturer	Heating Capacity	Efficiency	Location	Serving Area
Carrier	350 MBH heat input 283.5 MBH heat output	81% Eff.	Roof	Auditorium
Carrier	72MBH heat input and 59.04MBH heat output	82% Eff.	Roof	Auditorium/Stage
Carrier	72MBH heat input and 59.04MBH heat output	82% Eff.	Roof	Auditorium/Stage
Carrier	275MBH heat input and 223 MBH heat output.	81% Eff.	Roof	Gym
Carrier	275MBH heat input and 223 MBH heat output	81% Eff.	Roof	Gym
Carrier	72MBH heat input and 59.04 MBH heat output	81% Eff.	Roof	Café
Carrier	125MBH heat input and 102.5 MBH heat output	82% Eff.	Roof	Café
AAON	Heat Capacity is unknown due to fade name tag	Unknown	Roof	Café
Carrier	125MBH heat input and 102.5 MBH heat output	82% Eff.	Roof	Library

The water source heat pump loop is supplemented by a Bryan boiler having a rated input of 2,700 MBH and heat output of 2,160 MBH which results in a nameplate efficiency of 80%. The heat pumps loop water is circulated by three water pumps driven by 15 HP motors. After discussing with the facility staff, it was noted that there are about 82 water source heat pumps with various capacities.

Cooling: The building is 100% cooled by two cooling systems: the large rooms such as gymnasium, cafeteria and library are cooled by individual packaged roof top units (RTU) equipped with DX cooling coils; the classrooms, offices and hallways are cooled by water source heat pumps. Two blow-through type Baltimore AirCoil (BAC) cooling towers are used to dissipate the heat from the heat pump loop. These two cooling towers are original to the building and one of them is currently down for repairs. The cooling capacities of the RTUs are listed as follows:

Manufacturer	Cooling Capacity	Location	Serving Area
Carrier	~30 ton Cooling	Roof	Auditorium
Carrier	~5 ton Cooling	Roof	Auditorium/Stage
Carrier	~5 ton Cooling	Roof	Auditorium/Stage
Carrier	~15 ton Cooling	Roof	Gym
Carrier	~15 ton Cooling	Roof	Gym
Carrier	~4 ton Cooling	Roof	Café
Carrier	~8 ton Cooling	Roof	Café
AAON	~25 ton Cooling	Roof	Café
Carrier	~15 ton Cooling	Roof	Library

ECMs relative to converting water source heat pumps to ground source heat pumps and upgrading cooling towers and boilers are included.

Ventilation: The heat pump loop has about seven (7) designated outdoor air intake fans located on the roof to bring outdoor air to the heat pump ductwork systems. However, the amount of the outdoor air (OA) is unknown due to the inaccessibility to the fans. Each RTU has its own outdoor air intake and the outdoor air intake dampers are controlled by the central DDC system to utilize the economizer mode when the outdoor air temperature is applicable. During the site visit, it was observed that the damper positions of the RTUs vary from 10% to 25%. An ECM relative to the demand ventilation control on the gym/café RTUs is evaluated.

Exhaust: The gymnasium, cafeteria and library are exhausted by the RTUs. The amount of the exhaust air is interlocked with the amount of the outdoor air intake. Besides the RTUs, the rest of the building has a few exhaust fans including locker rooms, restrooms and general exhaust. The exhaust fans are located on the roof, but the capacities of the fan motors were unknown because the fans are all enclosed in the ductwork.

Kitchen has a 2' by 10' kitchen exhaust hood which is controlled by a manual switch. After discussing with kitchen staff, it was noted that the exhaust hood is manually turned on at 7:00AM and turned off at 12:30PM when the cooking is done. A controller for the kitchen hood would be recommended for energy savings.

Controls Systems

The school has a CM3 central direct digital control (DDC) system for all five schools. Most of the equipment in the high school is controlled by the central DDC system. The DDC system adjusts the outdoor air dampers positions for the RTUs to utilize the economize mode based on outdoor air temperature. The DDC system also has a room temperature setback program: the occupied room temperature is set at 71 ^{o}F. The unoccupied room temperature is set back to 60 ^{o}F during heating season and 76 ^{o}F during cooling season. The cooling system won't start until the outdoor temperature is equal or above 62 ^{o}F. The DDC system appears to be working

effectively and the HVAC equipment appears to be working efficiently, therefore, no ECMs are associated with control systems.

Domestic Hot Water Systems

The school has four domestic hot water (DHW) heaters distributed throughout the building. A gas fired Bradford White DHW heater located in the mechanical room is used to provide hot water for the kitchen and locker rooms. This heater has a rated energy input of 199.999 MBH and 98 gallon storage. Two Bradford White electric DHW heaters located in the janitor closet are used to provide hot water for most of the restrooms. These two heaters are identical: each has a rated 3.5kW heating capacity and 50 gallon storage. Another Bradford White heater located in Art room storage area is used to provide hot water for labs and restrooms nearby. This heater has a rated 4.5kW heating capacity.

An ECM is included to evaluate the replacement of the 4.5kW water heater with a high efficiency condensing gas domestic water heater.

Kitchen Equipment

Kitchen equipment includes two (2) reach-in refrigerators, one (1) reach-in freezer, one walk-in refrigerator and two walk-in freezers. There is no dishwasher in the school. The kitchen also has ovens, deep fryers and a 2' by 10' kitchen hood. Most of the kitchen equipment has Energy Star labels. A walk-in refrigerator/freezer controller is recommended in the ECM section.

Plumbing Systems

The faucets and toilets appear to be low flow fixtures. The urinals are the waterless type. The school has its own well water system and therefore does not pay for water directly. There are no ECMs associated with water reductions.

Plug Load

This school has computers, copiers, vending machines, residential appliances (microwave, refrigerator) and printers which contribute to the plug load in the building. The installation of vending machine occupancy sensors has been evaluated in an effort to reduce the plug load in the building.

Lighting Systems

The lighting system consists of 32W T8 fluorescent fixtures, T5 fluorescent fixtures and some metal halides. The majority lighting fixtures in the building are T8 fluorescent recessed or surface mounted lensed fixtures. The gymnasium has some high bay 54W T5 pendent fixtures and the dance studio is still using 150 W metal halides. All the lights in this building are controlled by manual switches or key switches. After discussion with facility staff, it was noted that the classroom lights are typically turned off after the janitor cleaning the rooms and the hallway lights are on 24/7. There are about 20 wall mounted metal halide exterior lights, according to the facility staff, these lights maybe on the timer control. We have provided three alternatives for lighting that include adding occupancy sensors to the existing lights, replacing the lights with LED lights and a third ECM that evaluates adding occupancy sensors to the proposed LED lights.

3.0 UTILITIES

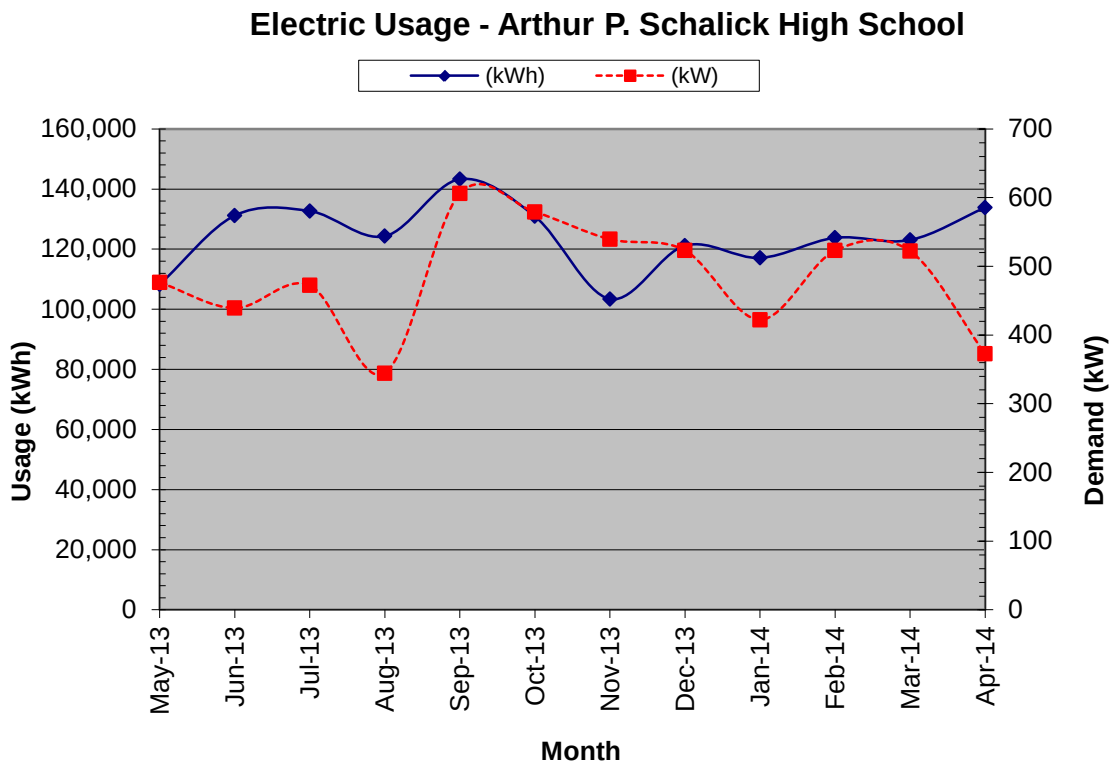
Utilities used by the building are delivered and supplied by the following utility companies:

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

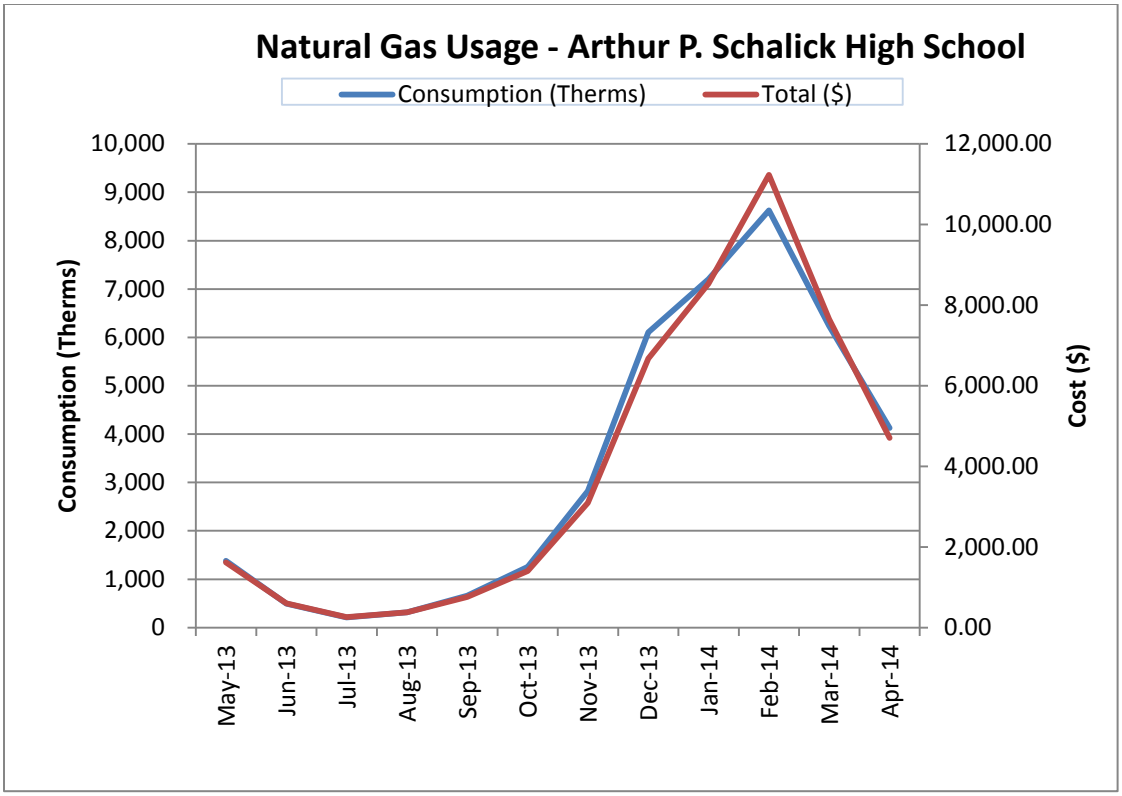
For the 12-month period ending in April 2014, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	1,492,963	kWh
Annual Cost	$217,205	$
Blended Unit Rate	$0.15	$/kWh
Supply Rate	$0.12	$/kWh
Demand Rate	$5.97	$/kW
Peak Demand	605.8	kW
Natural Gas		
Annual Consumption	39,423	Therms
Annual Cost	$46,904	$
Unit Rate	$1.19	$/therm

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



The electric usage is consistent throughout the year and varies with the usage of the building. The electric usage difference between cooling season and heating season is not significant because of the water source heat pump units. The heat pump units are operating in heating or cooling year round.



Natural gas is consumed by the heating boilers and the domestic hot water heater. Therefore, the usage during non-heating seasons is very small and consistent. The natural gas usage during the heating season is correlated to winter weather conditions.

See Appendix A for a utility analysis.

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

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	School Average Rate	NJ Average Rate	
Electricity	$/kWh	$0.15	$0.13	Y
Natural Gas	$/Therm	$1.19	$0.96	Y

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

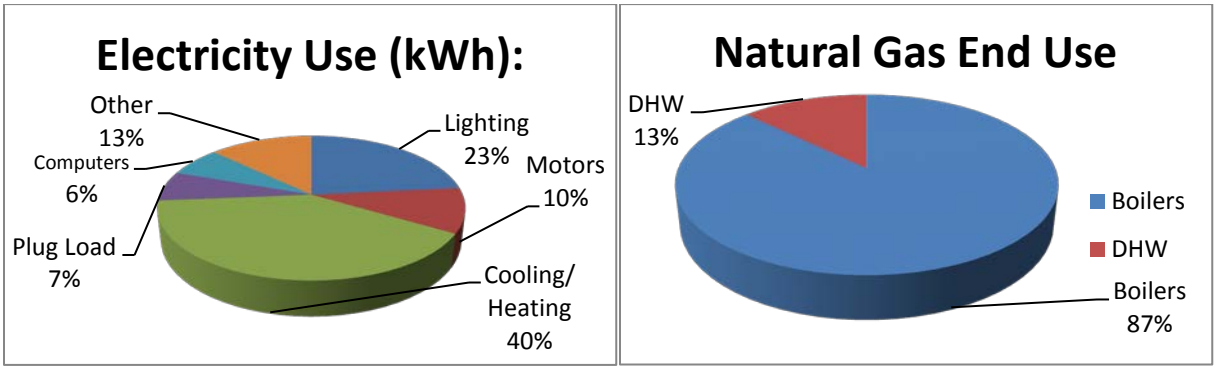
Additional information on selecting a third party energy supplier is available here:

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

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

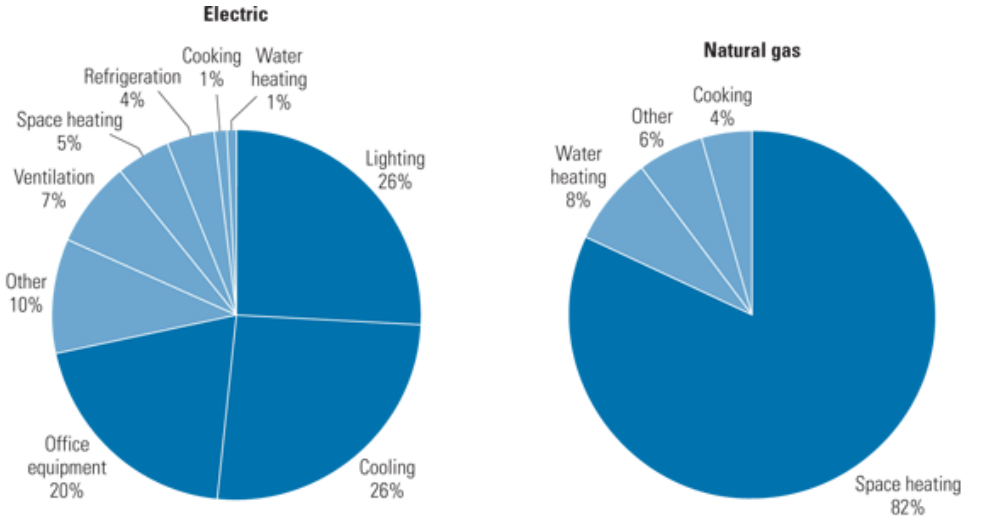
The charts below represent estimated utility end-use utility profiles for the building. The values used within the charts were estimated from a review of the utility analysis and the energy savings calculations.

Site End-Use Utility Profile



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

Typical End-Use Utility Profile for Educational Facilities



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

4.0 BENCHMARKING

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

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

Site EUI kBtu/ft^2/yr	Source EUI kBtu/ft^2/yr	Energy Star Rating (1-100)
80.7	179.8	35

The school has a below average Energy Star Rating Score (50 being the median score), and as such by implementing the measures discussed in this report, it is expected that the EUI can be further reduced and the Energy Star Rating further increased.

5.0 ENERGY CONSERVATION MEASURES

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

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

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

Energy savings were quantified in the form of:

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

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

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

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

5.1 ECM-1 Replace the Boiler with Condensing Boilers

The existing Bryan HHW boiler for the heat pump water loop is non-condensing type and has maximum thermal efficiencies in the 80% range. New modulating condensing gas boilers are available that minimally operate at 88%, and can operate as high as 96%. This ECM assesses the replacement of the boiler with three centrally located modulating condensing gas boilers which will provide the same amount of hot water for the heat pump water loop in the building.

To implement this ECM, The boiler would be removed it is suggested to install the new condensing boilers in the mechanical room at the same location of the old boiler. Piping and wiring modifications would be needed.

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

ECM-1 Replace the Boiler with Condensing Boilers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
170,451	0	0	3,527	4,197	(0.3)	5,250	40.6	39.4

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

This measure is recommended since the simple payback of all the recommended projects including this measure would be less than 15 years.

5.2 ECM-2 Replace Cooling Towers with a VFD Cooling Tower

The water source heat pump water loop is cooled by water provided from two dedicated BAC blow-through cooling towers. One of the cooling towers has been out of order for a while and one cooling tower is sufficient to provide the cooling for the water loop based on the discussion with the facility staff. The cooling tower fan is running at constant speed regardless of the load on the heat pump system. It was noted that this cooling tower is near the end of its useful life span based on the discussion with the facility staff. This ECM assessed replacing the cooling tower with a VFD induce draft cooling tower. The VFD is able to adjust fan speed as conditions change while maintaining the exact flow required; therefore, eliminating a constant flow rate that is designed for peak conditions. The VFD is able to increase or decreases the cooling towers fan speed as the load on the water loop changes. When the water loop has reduced heat dissipation, the VFD will reduce the energy consumed by the fan by slowing the motor while maintaining the required flow rate. Since a fan's power requirement varies proportionally with the cube of its speed, a small speed can result in a large power reduction.

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

ECM-2 Replace Cooling Towers with a VFD Cooling Tower

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
67,857	0	50,353	0	7,352	1.7	0	9.2	9.2

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

This measure is recommended.

5.3 ECM-3 Convert Water Source Heat Pump Loop to Ground Source Loop

Currently, the classrooms, offices and hallways are cooled by water source heat pumps. The water temperature is maintained between 80 ^{o}F and 95 ^{o}F by one gas fired boiler and two BAC cooling towers. However, the cooling towers are near the end of their useful life span and the boiler is not high efficiency condensing boiler. The school has larger amount of land available for ground work. Therefore, converting the existing water source heat pump loop to ground source heat pump loop is suggested. The ground source heat pump loop use the Earth as a heat sink in the summer and a heat source in the winter, and therefore reply on the relative warmth of the earth for their heating and cooling production and eliminate the energy usage currently used by boiler and cooling towers.

To implement this ECM, The boiler and cooling tower could be removed and bore field work would be required to install the underground piping loop. It is also suggested to install a new water to water heat exchanger separating the water loop from the underground loop to prevent condensate on the water loop pipes.

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

ECM-3 Convert Water Source Heat Pump Loop to Ground Source Loop

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
880,890	13	11,372	29,436	37,329	(0.1)	49,200	23.6	22.3

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

This measure is not recommended due to the long payback in this study. However, it should be noted that the estimated cost here is based on vertical heat pump loop with an addition water to water heat exchanger. The school may choose a horizontal heat pump loop without water to water heat exchanger which may have a more favorite payback period. A further study is suggested if this measure is considered.

5.4 ECM-4 Install Demand Control Ventilation on RTUs

The Gymnasium, Auditorium and Cafeteria have (3) large RTUs which have DX cooling and gas fired furnace. These RTUs are assumed to be designed to provide ventilation

based on maximum occupancy. Maximum occupancy occurs infrequently and by reducing the amount of ventilation energy savings will result. Installation of carbon dioxide (CO2) sensors will allow for a reduction of outside air during periods of low occupancy. The quantity of ventilation air will be based on maintaining an acceptable CO2 level in the space as an indicator of indoor air quality. A limit of 1000 PPM of CO2 is recommended in ASHRAE Standard 62-2010, Ventilation for Acceptable Indoor Air Quality. Sensors will be installed to measure the building air CO2 concentration, and the control sequence of operation changed. During unoccupied periods, the outside air dampers should be closed.

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

ECM-4 Install Demand Control Ventilation on RTUs

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
12,700	0	586	72	171	(0.7)	200	74.1	73.0

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

This measure is recommended since the simple payback of all the recommended projects including this measure would be less than 15 years.

5.5 ECM-5 Replace one Electric DHW Heater with a Condensing Gas Fired Heater

The building has three DHW heaters: one gas fired heater and two electric heaters. According to the facility staff, the gas fired heater was replaced in 2005 and still in excellent condition. One electric heater is located in the janitor closet which does not have space for the flue gas venting system. The other electric heater is located in a classroom storage room near the exterior wall which has space for the flue venting system. This heater has a rated one 4.5 kW heating capacity. It is suggested to replace this heater with a gas fired condensing heater. Energy savings could be realized by replacing the 4.5 kW electric heater with one high efficiency condensing gas fired heater, which can operate at efficiencies up to 96% and have less standby energy loss from the storage tank.

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

ECM-5 Replace one Electric DHW Heater with a Condensing Gas Fired Heater

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
16,354	5	7,290	-259	903	0.3	2,040	18.1	15.8

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

This measure is recommended since the simple payback of all the recommended projects including this measure would be less than 15 years.

5.6 ECM-6 Kitchen Hood Control

The kitchen contains a kitchen hood with one exhaust fan and one make up air unit that run continuously when the kitchen is operational. Installing a control system was evaluated. Upon activation, the hood lights turn on and the fans reach a preset minimum speed of between 10 and 50 percent. The exhaust fan speed increases based on exhaust air temperature when the cooking applications are on. During actual cooking, the speed increases to 100 percent until smoke and heat are removed. The control will also send a signal to the kitchen hood make-up air fan to modulate the speed on the make-up air fan drive based on exhaust air quantity.

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

ECM-6 Kitchen Hood Control

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
27,951	0	1,482	2,191	2,824	1.0	0	9.9	9.9

This measure is recommended.

5.7 ECM-7 Walk-in Cooler & Freezer EC Motor Retrofits

The cafeteria kitchen contains (2) walk-in cooler and (1) walk-in freezer. These units do not have controls and run continuously throughout the day. Installing a CoolTrol® Cooler Control System was assessed. The system will monitor both dry and wetbulb temperature within the walkin and allow evaporators and compressors to modulate up and down based on enthalpy setpoints rather than by dry bulb temperature alone. Savings is a result of reduced run time of evaporator fans, compressors and door heaters.

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

ECM-7 Walk-in Cooler & Freezer EC Motor Retrofits

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
20,625	0	9,338	0	1,363	0.3	225	15.1	15.0

This measure is recommended.

5.8 ECM-8 Install Vending Misers

Cold drink and snack vending machines are typically operating 24/7 regardless of occupancy. A vending miser uses a passive infrared occupancy sensor technology to detect potential customers and cycles the compressors during unoccupied times to maintain desired product temperatures. This measure considered installing vending misers to save energy on (2) refrigerated machines and (1) dry product machines in the cafeteria.

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

ECM-8 Install Vending Misers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
840	0	7,788	0	1,137	26.1	0	0.7	0.7

This measure is recommended.

5.9.1 ECM-L1 Lighting Replacement / Upgrades

The existing lighting system consists of mostly T8 linear fluorescent fixtures which until recently represented the most efficient lighting technology available.

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

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

ECM-L1 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
207,981	35	105,965	0	15,409	(0.1)	22,840	13.5	12.0

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

This measure is not recommended in lieu of ECM L3.

5.9.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

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

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

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

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
24,570	0	43,027	0	5,249	1.6	3,185	4.7	4.1

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

This measure is not recommended in lieu of ECM L3.

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

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

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
232,551	35	137,088	0	19,206	(0.0)	26,025	12.1	10.8

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

This measure is recommended.

5.10 Additional O&M Opportunities

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

- Replace filters in the HVAC system regularly.

6.0 PROJECT INCENTIVES

6.1 Incentives Overview

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

6.1.1 New Jersey Smart Start Program

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

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

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

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

6.1.2 Direct Install Program

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

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

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

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

The building does not qualify for this program because its electrical demand is higher than 200 kW.

Refer to Appendix D for more information on this program.

6.1.3 New Jersey Pay For Performance Program (P4P)

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

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

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

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

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

Electric

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

Gas

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

Incentive cap: 25% of total project cost

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

Electric

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

Gas

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

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

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

6.1.4 Energy Savings Improvement Plan

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

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

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

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

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

6.1.5 Renewable Energy Incentive Program

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

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

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

7.0 ALTERNATIVE ENERGY SCREENING EVALUATION

7.1 Solar

7.1.1 Photovoltaic Ground Solar Power Generation

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

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

Potential PV Array Size **(kW)**
246.4

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

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

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

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

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

Photovoltaic (PV) Rooftop Solar Power Generation – 246.4 kW System

Budgetary Cost	Annual Utility Savings			Total Savings	New Jersey Renewable SREC	Payback (without SREC)	Payback (with SREC)	Recommended
	Electricity		Natural Gas					
$	kW	kWh	Therms	$	$	Years	Years	Y/N
$985,600	246.4	399,699	0	$58,356	$69,947	16.9	7.7	FS

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

7.1.2 Solar Thermal Hot Water Generation

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

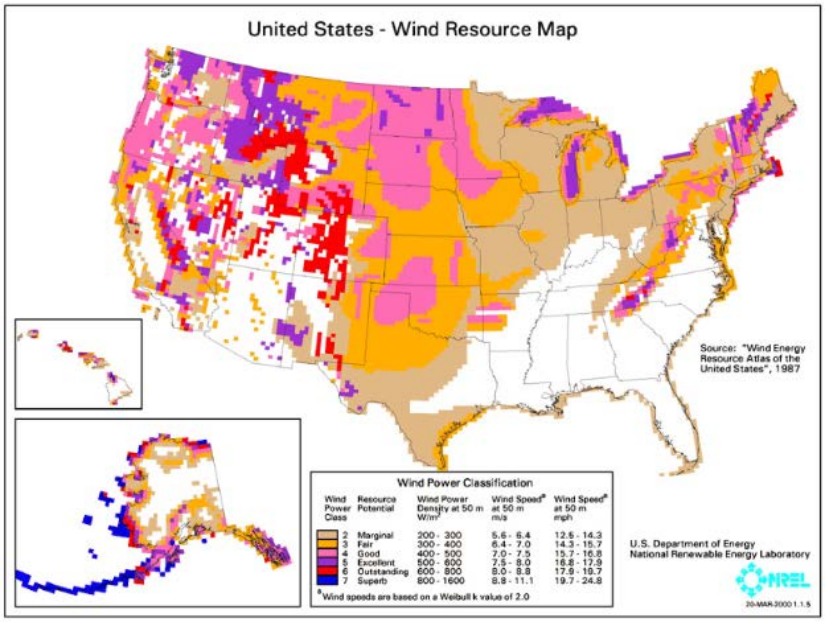
A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. Systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually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

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

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

7.2 Wind Powered Turbines

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



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

7.3 Combined Heat and Power Plant

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

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

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

7.4 Demand Response Curtailment

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

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

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From May 2013 through April 2014 the following table summarizes the electricity load profile for the building.

Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
605.8	344.3	485.0	Y	Y

This measure is not recommended because the building does not have enough onsite generation to cover the entire electrical load of the building.

8.0 CONCLUSIONS & RECOMMENDATIONS

The LGEA energy audit conducted by CHA for the building identified potential annual savings of $37,153/yr with an overall payback of 14.8 years, if the recommended ECMs are implemented.

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

Electric Savings (kWh)	Natural Gas Savings (therms)	Total Savings ($)	Payback (years)
213,924	5,531	$37,153	14.8

The following projects should be considered for implementation:

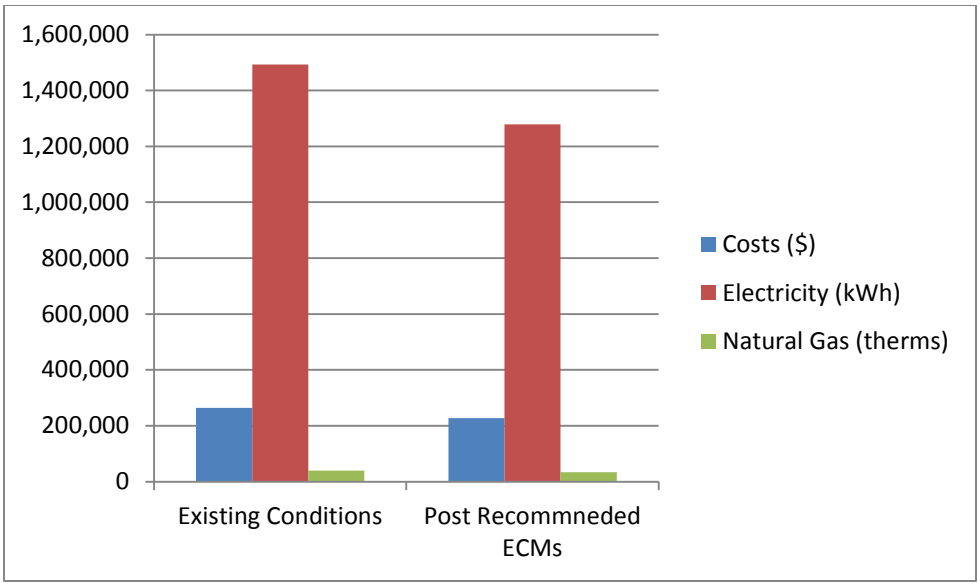
- Replace the Boiler with a Condensing Boiler
- Replace Cooling Towers with a VFD Cooling Tower
- Install Demand Control Ventilation on RTUs
- Replace One Electric DHW Heater with a Condensing Gas Fired Heater
- Kitchen Hood Control
- Walk-in Cooler & Freezer EC Motor Retrofits
- Install Vending Misers
- Lighting Replacements with Controls (Occupancy Sensors)

The following alternative energy measures are recommended for further study:

- Photovoltaic (PV) Rooftop Solar Power Generation – 246.4 kW System

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	264,109	226,956	14%
Electricity (kWh)	1,492,963	1,279,039	14%
Natural Gas (therms)	39,423	33,892	14%
Site EUI (kbtu/SF/Yr)	80.7	69.2	


1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Existing Conditions
Post Recommneded ECMs
Costs ($)
Electricity (kWh)
Natural Gas (therms)

APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

Arthur P. Schalick High School
718 Centerton Road Pittsgrove NJ 08318

Utility Bills: Account Numbers

Account Number	School Building	Location	Type	Notes
0353 6719 9995	Arthur P. Schalick High School	718 Centerton Road Pittsgrove NJ 08318	Electricity	
0549 9949 9996	Arthur P. Schalick High School	718 Centerton Road Pittsgrove NJ 08318	Electricity	
0353 7169 9998	Arthur P. Schalick High School	718 Centerton Road Pittsgrove NJ 08318	Electricity	
3 13 17 5310 0 7	Arthur P. Schalick High School	718 Centerton Road Pittsgrove NJ 08318	Natural Gas	

Arthur P. Schalick High School
718 Centerton Road Pittsgrove NJ 08318

For Service at: **Arthur P. Schalick High School**
Smmary of All the Accounts:
Delivery - Atlantic City Electric
Supplier - Constellation
Electric Service

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**
May-13	108,236	477	6,149	$ 9,222.00	$15,371.02	$ 12,861.12	$ 2,509.90	$ 0.14	$ 0.12	$ 5.27
June-13	131,171	439	7,661	$ 11,176.12	$18,836.71	$ 15,719.81	$ 3,116.90	$ 0.14	$ 0.12	$ 7.10
July-13	132,681	472	7,951	$ 11,304.78	$19,256.24	$ 16,177.71	$ 3,078.53	$ 0.15	$ 0.12	$ 6.52
August-13	124,320	344	7,185	$ 10,592.40	$17,777.32	$ 15,202.27	$ 2,575.05	$ 0.14	$ 0.12	$ 7.48
September-13	143,275	606	8,755	$ 12,207.42	$20,962.34	$ 17,456.10	$ 3,506.24	$ 0.15	$ 0.12	$ 5.79
October-13	130,914	579	8,216	$ 11,154.23	$19,369.80	$ 16,101.18	$ 3,268.62	$ 0.15	$ 0.12	$ 5.64
November-13	103,420	539	6,813	$ 8,811.66	$15,624.83	$ 12,885.86	$ 2,738.97	$ 0.15	$ 0.12	$ 5.08
December-13	121,172	523	7,717	$ 10,324.18	$18,041.67	$ 15,038.79	$ 3,002.88	$ 0.15	$ 0.12	$ 5.74
January-14	117,097	422	7,254	$ 9,976.98	$17,231.21	$ 14,457.85	$ 2,773.36	$ 0.15	$ 0.12	$ 6.57
February-14	123,789	523	7,314	$ 10,547.16	$17,861.12	$ 15,227.72	$ 2,633.40	$ 0.14	$ 0.12	$ 5.04
March-14	123,051	522	7,691	$ 10,484.28	$18,175.18	$ 15,166.76	$ 3,008.42	$ 0.15	$ 0.12	$ 5.76
April-14	133,837	373	7,586	$ 11,403.27	$18,989.39	$ 16,464.02	$ 2,525.37	$ 0.14	$ 0.12	$ 6.78
Total (last 12-months)	**1,492,963**	**605.80**	**$90,292.35**	**$127,204.48**	**$217,496.83**	**$182,759.19**	**$34,737.64**	**$ 0.146**	**$ 0.122**	**$ 5.969**
Notes	1	2	3	4	5	6	7	8	9	10

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

Supply Rate Fixed/Averaged:
$0.0852

Account #1:

For Service at: **Arthur P. Schalick High School**
Account No.: **0353 6719 9995**
Meter No.: **60127887**
Electric Service
Delivery - Atlantic City Electric
Supplier - Constellation

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**
May-13	1,096	4.9	$ 85.01	$ 93.38	$178.39	$ 172.28	$ 6.11	$ 0.16	$ 0.16	$ 1.25
June-13	811	4.8	$ 71.66	$ 69.10	$140.76	$ 133.35	$ 7.41	$ 0.17	$ 0.16	$ 1.54
July-13	921	4.9	$ 85.42	$ 78.47	$163.89	$ 155.57	$ 8.32	$ 0.18	$ 0.17	$ 1.70
August-13	960	5.9	$ 91.43	$ 81.79	$173.22	$ 162.92	$ 10.30	$ 0.18	$ 0.17	$ 1.75
September-13	975	4.0	$ 88.90	$ 83.07	$171.97	$ 165.21	$ 6.76	$ 0.18	$ 0.17	$ 1.69
October-13	1,074	4.9	$ 95.79	$ 91.51	$187.30	$ 179.90	$ 7.40	$ 0.17	$ 0.17	$ 1.51
November-13	1,400	7.0	$ 121.04	$ 119.28	$240.32	$ 231.24	$ 9.08	$ 0.17	$ 0.17	$ 1.30
December-13	2,132	6.0	$ 177.56	$ 181.65	$359.21	$ 350.31	$ 8.90	$ 0.17	$ 0.16	$ 1.48
January-14	1,837	7.0	$ 155.07	$ 156.52	$311.59	$ 301.54	$ 10.05	$ 0.17	$ 0.16	$ 1.44
February-14	2,149	6.9	$ 176.31	$ 183.10	$359.41	$ 350.46	$ 8.95	$ 0.17	$ 0.16	$ 1.30
March-14	1,771	6.1	$ 148.54	$ 150.89	$299.43	$ 290.39	$ 9.04	$ 0.17	$ 0.16	$ 1.48
April-14	1,557	6.9	$ 132.05	$ 132.66	$264.71	$ 255.44	$ 9.27	$ 0.17	$ 0.16	$ 1.34
Total (last 12-months)	**16,683**	**7.00**	**$1,428.78**	**$1,421.44**	**$2,850.22**	**$2,748.63**	**$101.59**	**$ 0.171**	**$ 0.165**	**$ 1.466**

Account #2:

For Service at: **Arthur P. Schalick High School**
Account No.: **0549 9949 9996**
Meter No.: **9566558**
Electric Service
Delivery - Atlantic City Electric
Supplier - Constellation

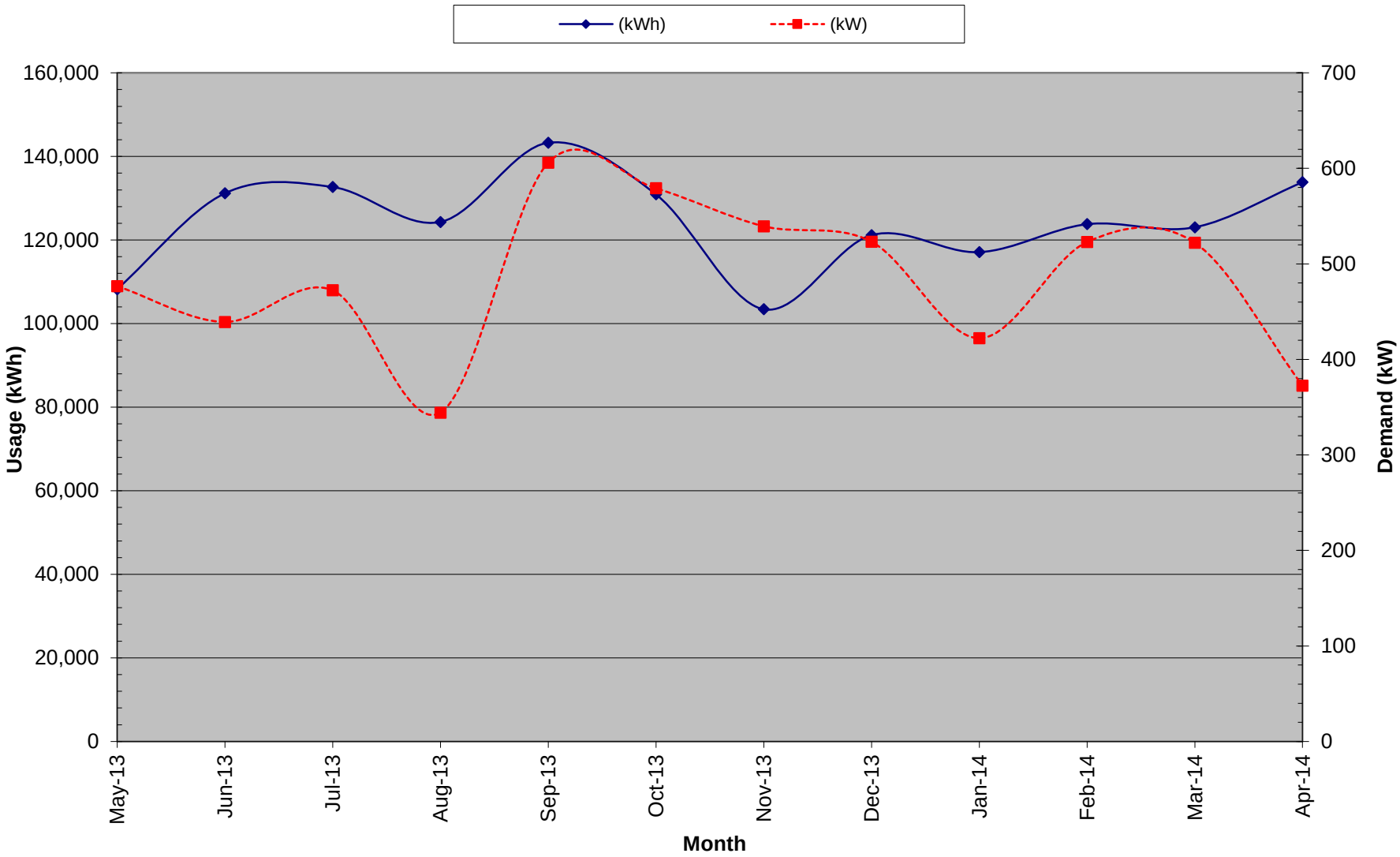
			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**
May-13	1,240	108.8	$ 225.52	$ 105.65	$331.17	$ 195.50	$ 135.67	$ 0.27	$ 0.16	$ 1.25
June-13	760	2.4	$ 65.62	$ 64.75	$130.37	$ 126.67	$ 3.70	$ 0.17	$ 0.17	$ 1.54
July-13	960	56.4	$ 177.28	$ 81.79	$259.07	$ 163.28	$ 95.79	$ 0.27	$ 0.17	$ 1.70
August-13	960	2.4	$ 86.67	$ 81.79	$168.46	$ 164.27	$ 4.19	$ 0.18	$ 0.17	$ 1.75
September-13	1,600	148.8	$ 384.22	$ 136.32	$520.54	$ 269.07	$ 251.47	$ 0.33	$ 0.17	$ 1.69
October-13	2,040	151.2	$ 395.85	$ 173.81	$569.66	$ 341.35	$ 228.31	$ 0.28	$ 0.17	$ 1.51
November-13	3,320	154.4	$ 460.39	$ 282.87	$743.26	$ 542.95	$ 200.31	$ 0.22	$ 0.16	$ 1.30
December-13	2,640	154.8	$ 431.06	$ 224.94	$656.00	$ 433.66	$ 222.34	$ 0.25	$ 0.16	$ 1.44
January-14	960	52.8	$ 158.22	$ 81.79	$240.01	$ 161.73	$ 78.28	$ 0.25	$ 0.17	$ 1.48
February-14	440	153.6	$ 238.62	$ 37.49	$276.11	$ 76.84	$ 199.27	$ 0.63	$ 0.17	$ 1.30
March-14	680	153.6	$ 286.11	$ 57.94	$344.05	$ 116.31	$ 227.74	$ 0.51	$ 0.17	$ 1.48
April-14	880	3.2	$ 77.14	$ 74.98	$152.12	$ 147.82	$ 4.30	$ 0.17	$ 0.17	$ 1.34
Total (last 12-months)	**16,480**	**154.80**	**$2,986.70**	**$1,404.14**	**$4,390.84**	**$2,739.47**	**$1,651.37**	**$ 0.266**	**$ 0.166**	**$ 1.446**

Account #3:

For Service at: **Arthur P. Schalick High School**
Account No.: **0353 7169 9998**
Meter No.: **82468885**
Electric Service
Delivery - Atlantic City Electric
Supplier - Constellation

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**
May-13	105,900	363.0	$ 5,838.49	$ 9,022.97	$14,861.46	$ 12,493.34	$ 2,368.12	$ 0.14	$ 0.12	$ 6.52
June-13	129,600	432.0	$ 7,523.31	$ 11,042.27	$18,565.58	$ 15,459.79	$ 3,105.79	$ 0.14	$ 0.12	$ 7.19
July-13	130,800	411.0	$ 7,688.76	$ 11,144.51	$18,833.27	$ 15,858.85	$ 2,974.42	$ 0.14	$ 0.12	$ 7.24
August-13	122,400	336.0	$ 7,006.82	$ 10,428.81	$17,435.63	$ 14,875.07	$ 2,560.56	$ 0.14	$ 0.12	$ 7.62
September-13	140,700	453.0	$ 8,281.80	$ 11,988.02	$20,269.82	$ 17,021.81	$ 3,248.01	$ 0.14	$ 0.12	$ 7.17
October-13	127,800	423.0	$ 7,723.93	$ 10,888.91	$18,612.84	$ 15,579.93	$ 3,032.91	$ 0.15	$ 0.12	$ 7.17
November-13	98,700	378.0	$ 6,231.74	$ 8,409.51	$14,641.25	$ 12,111.67	$ 2,529.58	$ 0.15	$ 0.12	$ 6.69
December-13	116,400	362.4	$ 7,108.87	$ 9,917.59	$17,026.46	$ 14,254.82	$ 2,771.64	$ 0.15	$ 0.12	$ 7.65
January-14	114,300	362.4	$ 6,940.94	$ 9,738.67	$16,679.61	$ 13,994.58	$ 2,685.03	$ 0.15	$ 0.12	$ 7.41
February-14	121,200	362.4	$ 6,899.03	$ 10,326.57	$17,225.60	$ 14,800.42	$ 2,425.18	$ 0.14	$ 0.12	$ 6.69
March-14	120,600	362.4	$ 7,256.25	$ 10,275.45	$17,531.70	$ 14,760.06	$ 2,771.64	$ 0.15	$ 0.12	$ 7.65
April-14	131,400	362.4	$ 7,376.93	$ 11,195.64	$18,572.57	$ 16,060.77	$ 2,511.80	$ 0.14	$ 0.12	$ 6.93
Total (last 12-months)	**1,459,800**	**453.00**	**$85,876.87**	**$124,378.91**	**$210,255.78**	**$177,271.10**	**$32,984.68**	**$ 0.144**	**$ 0.121**	**$ 7.158**

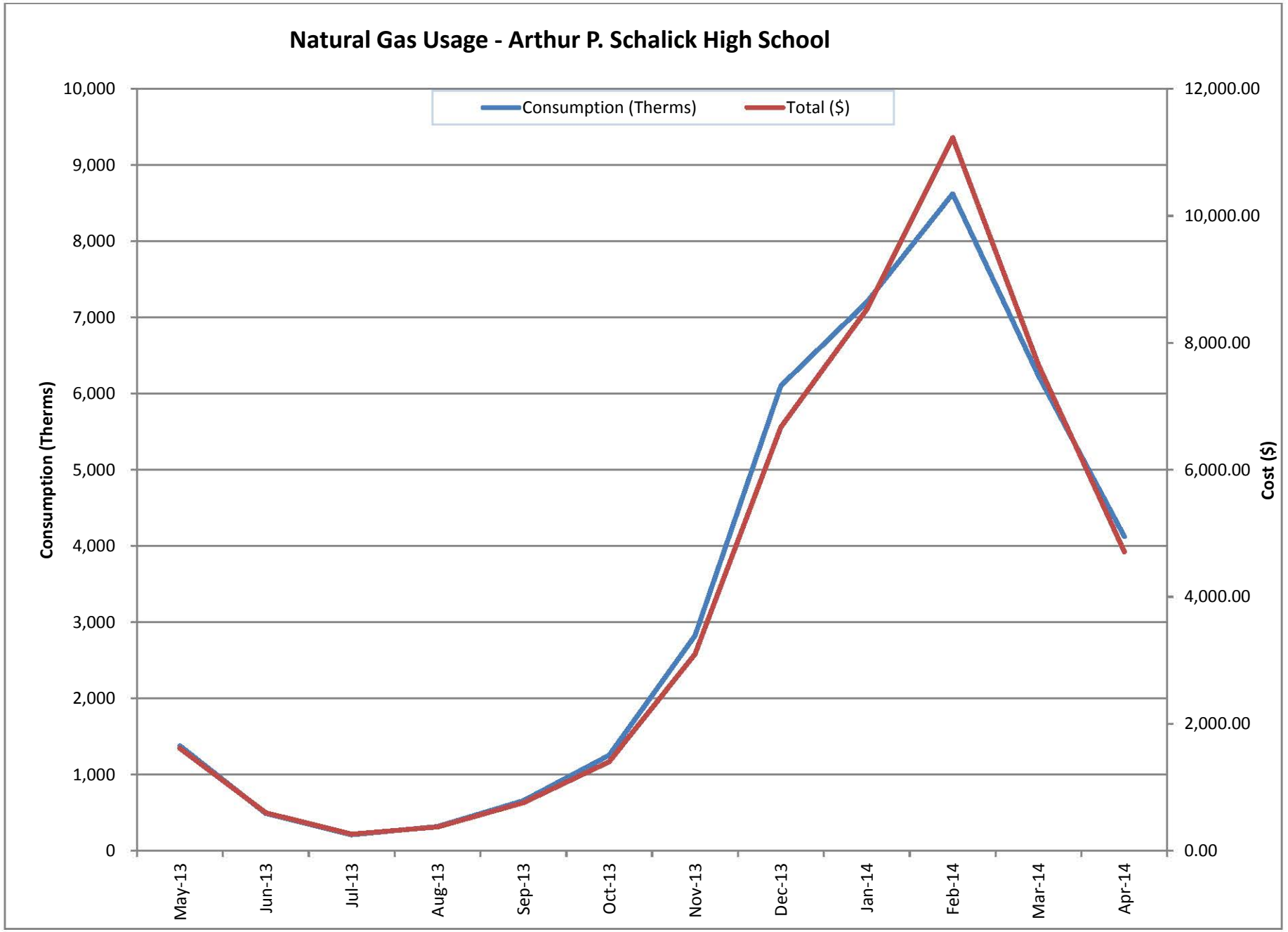
Electric Usage - Arthur P. Schalick High School



Arthur P. Schalick High School
718 Centerton Road Pittsgrove NJ 08318

For Service at: **Arthur P. Schalick High School**
Account No.: **3 13 17 5310 0 7**
Meter No.: **3511547** **485828** **051173**
Natural Gas Service
Delivery - South Jersey Gas
Supplier - Woodruff Energy

		Charges			Unit Costs		
Month	**Consumption (Therms)**	**Delivery ($)**	**Supply ($)**	**Total ($)**	**Delivery ($/Therm)**	**Supply ($/Therm)**	**Total ($/Therm)**
May-13	1,378	$ 805	$ 809	$ 1,614	$ 0.58	$ 0.59	$ 1.17
June-13	491	$ 308	$ 292	$ 600	$ 0.63	$ 0.59	$ 1.22
July-13	210	$ 146	$ 116	$ 262	$ 0.70	$ 0.55	$ 1.25
August-13	319	$ 210	$ 165	$ 375	$ 0.66	$ 0.52	$ 1.18
September-13	658	$ 410	$ 347	$ 757	$ 0.62	$ 0.53	$ 1.15
October-13	1,253	$ 752	$ 651	$ 1,403	$ 0.60	$ 0.52	$ 1.12
November-13	2,825	$ 1,638	$ 1,459	$ 3,098	$ 0.58	$ 0.52	$ 1.10
December-13	6,104	$ 3,520	$ 3,154	$ 6,673	$ 0.58	$ 0.52	$ 1.09
January-14	7,202	$ 4,104	$ 4,425	$ 8,529	$ 0.57	$ 0.61	$ 1.18
February-14	8,624	$ 4,859	$ 6,375	$ 11,233	$ 0.56	$ 0.74	$ 1.30
March-14	6,235	$ 3,518	$ 4,134	$ 7,652	$ 0.56	$ 0.66	$ 1.23
April-14	4,125	$ 2,366	$ 2,343	$ 4,708	$ 0.57	$ 0.57	$ 1.14
Total (12 - Month)	**39,423**			**$ 46,904.37**			**$ 1.190**


Natural Gas Usage - Arthur P. Schalick High School
Consumption (Therms)
Total ($)
Consumption (Therms)
Cost ($)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
12,000.00
10,000.00
8,000.00
6,000.00
4,000.00
2,000.00
0.00
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Feb-14
Mar-14
Apr-14

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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APPENDIX B

Equipment Inventory

CHA Project # 28484
ARTHUR P. SCHALICK HIGH SCHOOL
THE PITTSGROVE TOWNSHIP SCHOOL DISTRICT

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.	Current year	Years Old	ASHRAE life expectancy
Boiler	1	Bryan Boiler	CL-270W-GL	63379	HHW Boiler	2700 MBH input, 2160 MBH output 80% Eff.	High School MR	High School Heat Pump Loop	1986	-3		2014	28	25
HHW Pump Motor	1	Marathon Electric	CVH 254TTDX40226AD	E722	HHW Pump/Motor	15HP	High School MR	High School Heat Pump Loop HHW Circulation	1986	-8		2014	28	20
HHW Pump Motor	1	Marathon Electric	CVH 254TTDX40226AD	E722	HHW Pump/Motor	15HP	High School MR	High School Heat Pump Loop HHW Circulation	1986	-8		2014	28	20
HHW Pump Motor	1	US Electric	Unknown	Unknown	HHW Pump/Motor	15HP	High School MR	High School Heat Pump Loop HHW Circulation	1986	-8		2014	28	20
Cooling Tower	1	BAC	Unknown	Unknown	Cooling Tower	Blow-through Type Cooling Tower with Fan Motor Enclosed	On the Outside Ground next to the Mechanical Room	High School Heat Pump Loop	1976	-18		2014	38	20
Cooling Tower	1	BAC	Unknown	Unknown	Cooling Tower	Blow-through Type Cooling Tower with Fan Motor Enclosed	On the Outside Ground next to the Mechanical Room	High School Heat Pump Loop	1976	-18		2014	38	20
DHW-1	1	Bradford White	D100T1993N	JH16991781	Natural Gas DHW Heater	199,999 BTH	High School MR	One Section of High School	2004	10		2014	10	20
DHW-2	1	Bradford White	M250S6DS-1NCWW	LA33857990	Electric DHW Heater	3.5 kW 50 gallon	High School MR	One Section of High School	2004	10		2014	10	20
DHW-3	1	Bradford White	M250S6DS-1NCWW	KL28085862	Electric DHW Heater	4.5 kW 50 gallon	High School MR	One Section of High School	2004	10		2014	10	20
RTU	1	Carrier	48AYS030DN	2704F44468	RTU	350MBH heat input and 283.5 MBH heat output81% Eff. ~30 ton Cooling Capacity	Roof	Auditorium	2000	6		2014	14	20
RTU	1	Carrier	48HJD006-T-641RY	2704G30474	RTU	72MBH heat input and 59.04MBH heat output82% Eff. 5 ton Cooling Capacity	Roof	Auditorium/Stage	2000	6		2014	14	20
RTU	1	Carrier	48HJD006-T-641RY	2704G30475	RTU	72MBH heat input and 59.04MBH heat output82% Eff. 5 ton Cooling Capacity	Roof	Auditorium/Stage	2000	6		2014	14	20
RTU	1	Carrier	48TMM020G--611YA	2505F17033	RTU	275MBH heat input and 223 MBH heat output81% Eff. ~15 ton Cooling Capacity	Roof	Gym	2000	6		2014	14	20
RTU	1	Carrier	48TMM020G--611YA	2505F17032	RTU	275MBH heat input and 223 MBH heat output81% Eff. ~15 ton Cooling Capacity	Roof	Gym	2000	6		2014	14	20
RTU	1	Carrier	48HJD005-651	2908G10303	RTU	72MBH heat input and 59.04 MBH heat output81% Eff. ~4 ton Cooling Capacity	Roof	Café	2000	6		2014	14	20
RTU	1	Carrier	48HJD008-641	2808G21047	RTU	125MBH heat input and 102.5 MBH heat output82% Eff. ~8 ton Cooling Capacity	Roof	Café	2000	6		2014	14	20
RTU	1	AAON	RM-025-3-2-BA02-369	200808-AMGR44422	RTU	~25 ton Cooling Capacity and has a heat wheel heat recovery system, Heat Capacity is unknown	Roof	Café	2000	6		2014	14	20
RTU	1	Carrier	48HJD008-641	Unknown	RTU	125MBH heat input and 102.5 MBH heat output82% Eff. ~8 ton Cooling Capacity	Roof	Library	2000	6		2014	14	20
Heat Pump Unit	~82	EnerCon and Many Other Types	SCEHW0273302	EHW027	Water Source Heat Pump Units	Various Capacities	Ceiling Mounted Unit	Ofices, Classrooms and Hallways	1999	5		2014	15	20
DHW-4	1	Bradford White	M150S5DS	LL3989343	Electric DHW Heater	4.5kW	Classrooms and Labs	High School	2000	6		2014	14	20
Walk in Refrigerator	1	Bohn	ADT700A	D8J2809	Walk in Refrigerator	unknown	Kitchen	High School	2000	6		2014	14	20
Walk in Freezer	1	Bohn	LET13E1A	DBK1684	Walk in Freezer	unknown	Kitchen	High School	2000	6		2014	14	20
Walk in Freezer	1	Trenton	TEHA025L6-HT3B-F	82300863	Walk in Freezer	unknown	Kitchen	High School	2000	6		2014	14	20

Energy Audit of Pittsgrove Township Schools - Arthur Schalick High School
CHA Project No. 28484
Existing Lighting & Audit Input

Cost of Electricity: **$0.122** **$/kWh**
$5.97 **$/kW**

			EXISTING CONDITIONS									Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
40LED	Room 101	Classroom	15	T 32 R F 2 (ELE)	F42LL	60	0.90	SW	2600	2,340	C-OCC	
40LED	Room 102	Office	6	T 32 R F 2 (ELE)	F42LL	60	0.36	SW	2600	936	C-OCC	
40LED	Room 103	Office	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	2600	624	C-OCC	
40LED	Room 104	Classroom	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
40LED	Room 105	Classroom	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
40LED	Room 106	Classroom	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
40LED	Room 107	Classroom	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
40LED	Room 108	Classroom	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
40LED	Room 109	Classroom	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
40LED	Room 110	Classroom	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
40LED	Room 111	Classroom	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
40LED	Corridor	Hallway	30	T 32 R F 2 (ELE)	F42LL	60	1.80	SW	6240	11,232	C-OCC	
40LED	Work Room	Office	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	2600	624	C-OCC	
198	Work Room	Office	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.03	SW	2600	81	C-OCC	
40LED	Exam Room	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
40LED	Nurse Room and Rest Area	Office	7	T 32 R F 2 (ELE)	F42LL	60	0.42	SW	2600	1,092	C-OCC	
40LED	Office	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
198LED	Waiting Room	Office	22	2T 17 R F 2 (ELE)	F22LL	31	0.68	SW	2600	1,773	C-OCC	
40LED	Office	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
40LED	Office	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
40LED	Office	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
40LED	VP Office	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
198LED	Record Room	Office	5	2T 17 R F 2 (ELE)	F22LL	31	0.16	SW	2600	403	C-OCC	
198LED	General Office	Office	16	2T 17 R F 2 (ELE)	F22LL	31	0.50	SW	2600	1,290	C-OCC	
198LED	Conference Room	Conference	5	2T 17 R F 2 (ELE)	F22LL	31	0.16	SW	1560	242	C-OCC	
198LED	Principle Office	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.12	SW	2600	322	C-OCC	
198LED	Office	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.12	SW	2600	322	C-OCC	
198LED	Office	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.12	SW	2600	322	C-OCC	
24LED	Room 401	Office	5	1B 32 P F 2 (ELE)	F42LL	60	0.30	SW	2600	780	C-OCC	
24LED	Room 402	Classroom	5	1B 32 P F 2 (ELE)	F42LL	60	0.30	SW	2600	780	C-OCC	
24LED	Room 403	Classroom	10	1B 32 P F 2 (ELE)	F42LL	60	0.60	SW	2600	1,560	C-OCC	
24LED	Room 404	Classroom	15	1B 32 P F 2 (ELE)	F42LL	60	0.90	SW	2600	2,340	C-OCC	
24LED	Room 405	Classroom	9	1B 32 P F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
24LED	Room 406	Classroom	9	1B 32 P F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
24LED	Room 407	Classroom	9	1B 32 P F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
24LED	Room 408	Classroom	9	1B 32 P F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
24LED	Room 409	Classroom	9	1B 32 P F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
24LED	Office	Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
24LED	Corridor	Hallway	8	1B 32 P F 2 (ELE)	F42LL	60	0.48	SW	6240	2,995	C-OCC	
212	Library	Lib	50	T 32 R F 4 (ELE) (TWO SWITCH)	F44ILL	112	5.60	SW	3120	17,472	C-OCC	
35LED	Room 200	Classroom	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.62	SW	2600	4,212	C-OCC	
35LED	Room 201	Classroom	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	SW	2600	2,808	C-OCC	
35LED	Room 202	Classroom	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.62	SW	2600	4,212	C-OCC	
35LED	Room 203	Classroom	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	SW	2600	2,808	C-OCC	
35LED	Room 204	Classroom	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	2600	1,404	C-OCC	
35LED	Room 205 L	Classroom	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	2600	1,404	C-OCC	
35LED	Room 205 C	Classroom	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	2600	1,404	C-OCC	
35LED	Room 206	Classroom	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	2600	1,404	C-OCC	
35LED	Room 207	Classroom	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.35	SW	2600	3,510	C-OCC	
35LED	Room 208	Classroom	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	SW	2600	2,808	C-OCC	
35LED	Room 209	Classroom	10	T 32 R F 3 (ELE)	F43ILL/2	90	0.90	SW	2600	2,340	C-OCC	
35LED	Room 211	Classroom	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.35	SW	2600	3,510	C-OCC	
35LED	Room 212	Classroom	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.35	SW	2600	3,510	C-OCC	
24LED	Room 212 Storage	Classroom	9	1B 32 P F 2 (ELE)	F42LL	60	0.54	SW	2600	1,404	C-OCC	
35LED	Room 213	Classroom	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	SW	2600	2,808	C-OCC	
35LED	Room 215	Classroom	24	T 32 R F 3 (ELE)	F43ILL/2	90	2.16	SW	2600	5,616	C-OCC	
35LED	Room 217	Classroom	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.62	SW	2600	4,212	C-OCC	
24LED	Corridor	Hallway	9	1B 32 P F 2 (ELE)	F42LL	60	0.54	SW	6240	3,370	C-OCC	
18LED	Stage	Auditorium	6	T 32 R F 4 (ELE)	F44ILL	112	0.67	SW	3120	2,097	None	
217	Auditorium	Auditorium	23	2B 17 C F 2 (ELE)	F22ILL	33	0.76	SW	3120	2,368	None	
24LED	Lobby	Hallway	8	1B 32 P F 2 (ELE)	F42LL	60	0.48	SW	6240	2,995	C-OCC	
196	Weight Room	Gymnasium	12	W 32 C F 4 (ELE)	F44ILL	112	1.34	SW	3120	4,193	None	
169LED	Dance Studio	Gymnasium	24	WP 250 MH	MH250/1	295	7.08	SW	3120	22,090	None	
199	Weight Room Storage	Storage Area	2	W 32 C F 1 (ELE)	F41LL	32	0.06	SW	1560	100	C-OCC	
24LED	Therapy Room	Gymnasium	4	1B 32 P F 2 (ELE)	F42LL	60	0.24	SW	3120	749	None	
18LED	Cafeteria	Cafeteria	54	T 32 R F 4 (ELE)	F44ILL	112	6.05	SW	2600	15,725	None	
35LED	Corridor	Hallway	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	6240	3,370	None	
18LED	Kitchen	Kitchen	9	T 32 R F 4 (ELE)	F44ILL	112	1.01	SW	2600	2,621	None	
18LED	Food Dry	Kitchen	3	T 32 R F 4 (ELE)	F44ILL	112	0.34	SW	2600	874	None	
18LED	Corridor	Hallway	6	T 32 R F 4 (ELE)	F44ILL	112	0.67	SW	6240	4,193	None	
24LED	Boiler Room	Mechanical Room	17	1B 32 P F 2 (ELE)	F42LL	60	1.02	SW	6240	6,365	None	

Energy Audit of Pittsgrove Township Schools - Arthur Schalick High School
CHA Project No. 28484
Existing Lighting & Audit Input

Cost of Electricity: **$0.122** **$/kWh**
$5.97 **$/kW**

			EXISTING CONDITIONS									Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
24LED	Boys Room	Restroom	4	1B 32 P F 2 (ELE)	F42LL	60	0.24	SW	3120	749	C-OCC	
24LED	Girls Room	Restroom	4	1B 32 P F 2 (ELE)	F42LL	60	0.24	SW	3120	749	C-OCC	
24LED	Corridor	Hallway	27	1B 32 P F 2 (ELE)	F42LL	60	1.62	SW	6240	10,109	C-OCC	
35LED	Room 301	Classroom	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	SW	2600	2,106	C-OCC	
18LED	Room 302	Classroom	6	T 32 R F 4 (ELE)	F44ILL	112	0.67	SW	2600	1,747	C-OCC	
202	Room 303	Classroom	6	2T 17 R F 4 (ELE)	F22ILL	33	0.20	SW	2600	515	C-OCC	
35LED	SCI	Classroom	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	2600	1,404	C-OCC	
35LED	Room 603	Classroom	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	2600	936	C-OCC	
35LED	Room 602	Classroom	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	2600	702	C-OCC	
35LED	Room 309	Classroom	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	2600	1,404	C-OCC	
35LED	Room 301	Classroom	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	SW	2600	2,106	C-OCC	
40LED	Room 311	Classroom	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	2600	624	C-OCC	
40LED	Room 311 Storage	Storage Area	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	1560	374	C-OCC	
35LED	Room 315	Classroom	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	SW	2600	2,106	C-OCC	
35LED	Room 313	Classroom	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	SW	2600	2,106	C-OCC	
199	Boys Locker Room	Restroom	28	W 32 C F 1 (ELE)	F41LL	32	0.90	SW	3120	2,796	C-OCC	
24LED	PE Office	Office	4	1B 32 P F 2 (ELE)	F42LL	60	0.24	SW	2600	624	C-OCC	
24LED	Coach Office	Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
199	Storage	Storage Area	2	W 32 C F 1 (ELE)	F41LL	32	0.06	SW	1560	100	C-OCC	
24LED	Shower	Restroom	3	1B 32 P F 2 (ELE)	F42LL	60	0.18	SW	3120	562	C-OCC	
206	Shower	Restroom	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.21	SW	3120	646	C-OCC	
24LED	Restroom	Restroom	2	1B 32 P F 2 (ELE)	F42LL	60	0.12	SW	3120	374	C-OCC	
24LED	Team Room	Restroom	3	1B 32 P F 2 (ELE)	F42LL	60	0.18	SW	3120	562	C-OCC	
199	Girls Locker Room	Restroom	28	W 32 C F 1 (ELE)	F41LL	32	0.90	SW	3120	2,796	C-OCC	
24LED	PE Office	Office	4	1B 32 P F 2 (ELE)	F42LL	60	0.24	SW	2600	624	C-OCC	
24LED	Coach Office	Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.12	SW	2600	312	C-OCC	
199	Storage	Storage Area	2	W 32 C F 1 (ELE)	F41LL	32	0.06	SW	1560	100	C-OCC	
24LED	Shower	Restroom	3	1B 32 P F 2 (ELE)	F42LL	60	0.18	SW	3120	562	C-OCC	
206	Shower	Restroom	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.21	SW	3120	646	C-OCC	
24LED	Restroom	Restroom	2	1B 32 P F 2 (ELE)	F42LL	60	0.12	SW	3120	374	C-OCC	
24LED	Team Room	Restroom	3	1B 32 P F 2 (ELE)	F42LL	60	0.18	SW	3120	562	C-OCC	
250	Gymnasium	Gymnasium	30	T 54 W F 3 (ELE) (T-5)	F43GHL	177	5.31	SW	3120	16,567	None	
	Total		**978**				**79.41**			**244,702**		

APPENDIX C

ECM Calculations

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484

Rate of Discount (used for NPV) 3.0%

Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
$ 0.146	$/kWh blended		0.000420205	112,000	Electric	Natural Gas	Fuel Oil
$ 0.122	$/kWh supply	1,492,963	0.000420205		$ 217,205	$ 46,904	
$ 5.97	$/kW	605.8	0				
$ 1.19	$/Therm	39,423	0.00533471				
Estimated $ 7.50	$/kgals		0				
	$/Gal						

Arthur Schalick High School

Recommend? Y or N		Item	Savings kW	kWh	therms	No. 2 Oil gal	Water kgal	$	Cost	Simple Payback	Life Expectancy	Equivalent CO_2 (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings kW	kWh	therms	kgal/yr	$	ROI	NPV	IRR
Y	ECM-1	Replace the Boiler with a Condensing Boiler	0.0	0	3,527	0	0	4,197	$ 170,451	40.6	30	18.8	$ 5,250	N	39.4	0.0	0	105,802	0	$ 125,905	(0.3)	($82,942)	-1.7%
Y	ECM-2	Replace Cooling Towers with a VFD Cooling Tower	0.0	50,353	0	0	0	7,352	$ 67,857	9.2	25	21.2	$ -	N	9.2	0.0	1,258,819	0	0	$ 183,788	1.7	$60,155	9.8%
N	ECM-3	Convert Water Source Heat Pump Loop to Ground Source Loop	12.7	11,372	29,436	0	0	37,329	$ 880,890	23.6	20	161.8	$ 49,200	N	22.3	254.9	227,445	588,713	0	$ 752,031	(0.1)	($276,334)	-1.0%
Y	ECM-4	Install Demand Control Ventilation on RTUs	0.0	586	72	0	0	171	$ 12,700	74.1	15	0.6	$ 200	N	73.0	0.0	8,792	1,080	0	$ 2,569	(0.8)	($10,455)	-15.4%
Y	ECM-5	Replace One Electric DHW Heater with a Condensing Gas Fired Heater	4.5	7,290	(259)	0	0	903	$ 16,354	18.1	15	1.7	$ 2,040	N	15.8	67.5	109,349	(3,888)	0	$ 16,174	(0.0)	($3,530)	-0.7%
Y	ECM-6	Kitchen Hood Control	0.0	1,482	2,191	0	0	2,824	$ 27,951	9.9	20	12.3	$ -	N	9.9	0.0	29,631	43,829	0	$ 56,483	1.0	$14,065	7.9%
Y	ECM-7	Walk-in Cooler & Freezer EC Motor Retrofits	0.0	9,338	0	0	0	1,363	$ 20,625	15.1	20	3.9	$ 225	N	15.0	0.0	186,757	0	0	$ 27,267	0.3	($117)	2.9%
Y	ECM-8	Install Vending Misers	0.0	7,788	0	0	0	1,137	$ 840	0.7	18	3.3	$ -	N	0.7	0.0	140,184	0	0	$ 20,467	23.4	$14,798	135.3%
N	ECM-L1	Lighting Replacements / Upgrades	34.6	105,965	0	0	0	15,409	$ 207,981	13.5	15	44.5	$ 22,840	N	12.0	519.6	1,589,475	0	0	$ 269,281	0.3	($1,190)	2.9%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	43,027	0	0	0	5,249	$ 24,570	4.7	15	18.1	$ 3,185	N	4.1	0.0	645,405	0	0	$ 94,229	2.8	$41,281	23.5%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	34.6	137,088	0	0	0	19,206	$ 232,551	12.1	15	57.6	$ 26,025	N	10.8	519.6	2,056,320	0	0	$ 337,441	0.5	$22,753	4.5%
		Total (Does Not Include ECM-L1 & ECM-L2)	**51.9**	**225,296**	**34,967**	**0**	**0**	**$ 74,482**	**$ 1,430,220**	**19.2**	**19.8**	**281**	**$ 82,940**		**18.1**	**842**	**4,017,297**	**735,538**	**-**	**$ 1,522,124**	**0.1**	**(261,607)**	**0.5%**
		Recommended Measures (highlighted green above)	**39.1**	**213,924**	**5,531**	**0**	**0**	**$ 37,153**	**$ 549,330**	**14.8**	**19.8**	**119**	**$ 33,740**	**0**	**13.9**	**587**	**3,789,852**	**146,824**	**-**	**$ 770,092**	**0.4**	**14,728**	**3.4%**
		% of Existing	**6%**	**14%**	**14%**	**0**	**0**																

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

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

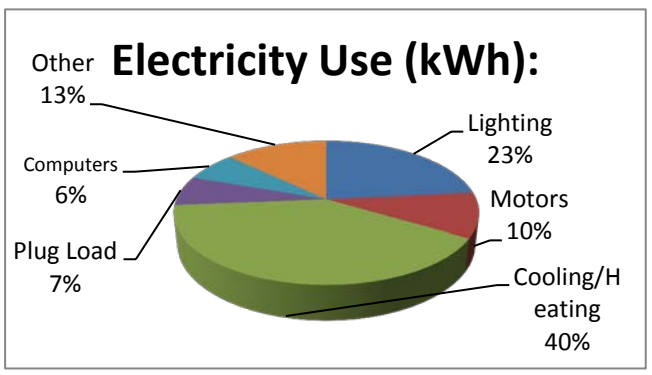
Heating System Efficiency	80%
Cooling Eff (kW/ton)	1.2

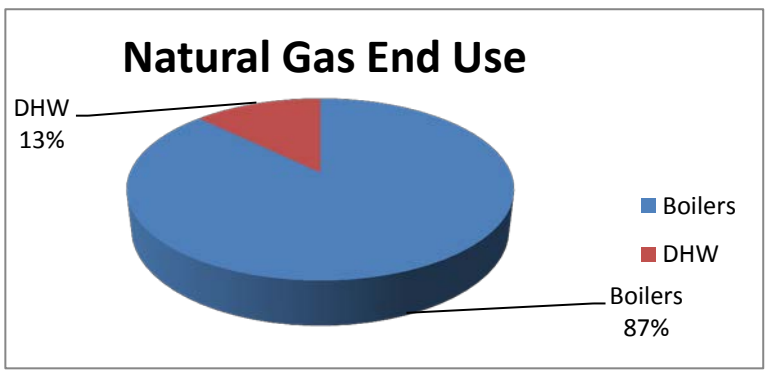
Heating		
Hours	4,427	Hrs
Weighted Avg	40	F
Avg	28	F

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

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

Utility End Use Analysis			
Electricity Use (kWh):		**Notes/Comments:**	
1,492,963	Total	Based on utility analysis	
350,000	Lighting	From Lighting Calculations	23%
150,000	Motors	Estimated	10%
600,000	Cooling/Heating	Estimated	40%
100,000	Plug Load	Estimated	7%
100,000	Computers	Estimated	7%
192,963	Other	Remaining	13%
Natural Gas Use (Therms):		**Notes/Comments:**	
39,423	Total	Based on utility analysis	
34,391	Boilers	Therms/SF x Square Feet Served	87%
5,032	DHW	Based on utility analysis	13%





Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-1 Replace the Boiler with a Condensing Boiler

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

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 1.19	/ Therm	Natural Gas
Baseline Fuel Cost		/ Gal	No. 2 Oil
FORMULA CONSTANTS			
Oversize Factor	0.8		
Hours per Day	24		
Infrared Conversion Factor	1.0		1.0 if Boiler, 0.8 if Infrared Heater
EXISTING			
Capacity	2,700,000	btu/hr	Estimated Boiler Load % and Capacity
Heating Combustion Efficiency	80%		Estimated averaged Efficiency
Heating Degree-Day	2,792	Degree-day	
Design Temperature Difference	57	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	2,700,000	btu/hr	
Efficiency	90%		
SAVINGS			
Fuel Savings	3,527	therms	NJ Protocols Calculation
Fuel Cost Savings	$ 4,197		

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

Algorithms

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

Definition of Variables

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

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

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

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

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

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

EFF_B = Efficiency of baseline heaters (AFUE %)

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

Furnaces and Boilers

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

Sources:

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

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-1 Replace the Boiler with a Condensing Boiler - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
1,000 MBH NG Condensing Boiler	3	EA	$ 20,000	$ 10,000		$ 61,620	$ 37,380	$ -	$ 99,000	Vendor Estimate
Flue Installation	1	LS	$2,500.0	$2,500.00		$ 2,568	$ 3,115	$ -	$ 5,683	Vendor Estimate
controls	1	EA	$ 500.0	$1,500.00		$ 514	$ 1,869	$ -	$ 2,383	Estimated
Miscellaneous Electrical	1	LS	$ 1,000	$ 2,500		$ 1,027	$ 3,115	$ -	$ 4,142	Estimated
Miscellaneous HW Piping	1	LS	$ 2,000	$ 1,000		$ 2,054	$ 1,246	$ -	$ 3,300	Estimated
Pumps	4	EA	$ 3,500	$ 1,500		$ 14,378	$ 7,476	$ -	$ 21,854	Estimated
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

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

$ 136,361	Subtotal
$ 34,090	25% Contingency
$ 170,451	**Total**

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-2 Replace Cooling Towers with a VFD Cooling Tower

Summary		
Electric Savings	50,353	kWh/yr
Cost Savings	$ 7,352	per year
Implementation Cost	$ 67,857	
Simple Payback	9.2	Years

Electric Cost $ 0.15 $/kWh blended

Description: the existing cooling towers are blowthrough type cooling towers and are near the end of their useful life span. It was noted that these two cooling towers are oversized for the heat pump loop. Therefore, replacing them with one drawthrough cooling tower equipped with VFD fan will reduce energy usage.

Old Cooling Tower Energy Usage:

Motor ID	Qty*	HP**	Total HP	Existing Motor Eff.	Exist. Motor kW
Tower Fan	1	30.0	30.0	93.0%	19.25

*according to the facility staff, only one cooling tower runs
** Estimated cooling tower capacity

OAT - DB Avg Temp F	OAT - WB Avg Temp F	Annual Hours in Bin	Cooling Hours Bin	Fan Load %	Existing Fan kWh
92.5	75	17	17	100%	327
87.5	74	61	61	100%	1,174
82.5	72	132	132	100%	2,541
77.5	69	344	344	100%	6,623
72.5	67	566	566	100%	10,896
67.5	64	755	755	100%	14,535
62.5	62	780	780	100%	15,016
57.5	58	889	889	100%	17,115
52.5	53	742	742	0%	0
47.5	47	710	710	0%	0
42.5	43	642	642	0%	0
37.5	38	795	795	0%	0
32.5	34	784	784	0%	0
27.5	30	682	682	0%	0
22.5	25	345	345	0%	0
17.5	20	229	229	0%	0
12.5	16	189	189	0%	0
7.5	11	70	70	0%	0
2.5	6	22	22	0%	0
-2.5	2	6	6	0%	0
		8,760	**8,760**		**68,228**

New Cooling Tower Energy Usage:

Motor ID	Qty	HP	Total HP	Proposed Motor Eff.	Exist. Motor kW Note 1	VFD Eff
Tower Fan	1	30.0	30.0	93.0%	19.25	98.5%

OAT - DB Avg Temp F	OAT - WB Avg Temp F	Annual Hours in Bin	Cooling Hours Bin	Fan Load %	Proposed Fan kW	Proposed Fan kWh	Proposed Savings kWh
92.5	75	17	17	100%	19.5	332	-5
87.5	74	61	61	91%	15.6	953	221
82.5	72	132	132	83%	12.2	1,612	929
77.5	69	344	344	74%	9.3	3,198	3,425
72.5	67	566	566	66%	6.8	3,873	7,024
67.5	64	755	755	57%	4.8	3,642	10,893
62.5	62	780	780	49%	3.2	2,507	12,510
57.5	58	889	889	40%	2.0	1,758	15,356
52.5	53	742	742	0%	0.0	0	0
47.5	47	710	710	0%	0.0	0	0
42.5	43	642	642	0%	0.0	0	0
37.5	38	795	795	0%	0.0	0	0
32.5	34	784	784	0%	0.0	0	0
27.5	30	682	682	0%	0.0	0	0
22.5	25	345	345	0%	0.0	0	0
17.5	20	229	229	0%	0.0	0	0
12.5	16	189	189	0%	0.0	0	0
7.5	11	70	70	0%	0.0	0	0
2.5	6	22	22	0%	0.0	0	0
-2.5	2	6	6	0%	0.0	0	0
		8,760	**8,760**		**3.68**	**17,875**	**50,353**

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-2 Replace Cooling Towers with a VFD Cooling Tower - Cost

Multipliers	
Material:	1.05
Labor:	1.05
Equipment:	1.05

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
30 HP VSD	1	EA	$ 4,016	$ 1,929		$ 4,217	$ 2,026	$ -	$ 6,243	RS Means 2012
Cooling Tower	1	EA	$ 33,300	$ 3,150		$ 34,965	$ 3,308	$ -	$ 38,273	RS Means 2012
30 HP Motor	1	EA	$ 2,069	$ 2,586		$ 2,172	$ 2,716	$ -	$ 4,888	RS Means 2012
Temp Sensors	1	LS	$ 1,150	$ 500		$ 1,208	$ 525	$ -	$ 1,733	Includes tapping
DDC Control System	1	EA	$ 500	$ 2,500		$ 525	$ 2,625	$ -	$ 3,150	Estimated

$	54,286	Subtotal
$	13,571	25% Contingency
$	**67,857**	**Total**

* Installation will be completed by plant maintenance personnel.

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-3 Convert Water Source Heat Pump Loop to Ground Source Loop

Description: This ECM evaluates converting the existing water source heat pump loop to a geothermal heat pump loop. The savings result from the elimination of boiler and cooling towers. Water to Water heat pumps would replace the boiler to temper the ground loop water for use by the existing watersource heat pumps. The addition of pumping and heat pump power is also considered.

Summary

Demand Savings	12.74	kW
Electric Savings	11,372	kWh/yr
Natural Gas Savings	29,436	therms/yr
Cost Savings	$ 37,745	per year
Implementation Cost	$ 880,890	
Simple Payback	23.3	Years

Unit Cost of Utility

$ 0.160	$/kWh blended
$ 0.140	$/kWh supply
$ 5.43	$/kW
$ 1.20	$/Therm

1. Savings From Boiler:

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 1.19	/ Therm	Natural Gas
Baseline Fuel Cost		/ Gal	No. 2 Oil
FORMULA CONSTANTS			
Oversize Factor	0.8		
Hours per Day	24		
Infrared Conversion Factor	1.0		1.0 if Boiler, 0.8 if Infrared Heater
EXISTING			
Capacity	2,700,000	btu/hr	Estimated Boiler Load % and Capacity
Heating Combustion Efficiency	80%		Estimated averaged Efficiency
Heating Degree-Day	2,792	Degree-day	
Design Temperature Difference	56	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	270,000	btu/hr	Estimated the boiler only needs to be10% loaded
Efficiency	90%		
SAVINGS			
Fuel Savings	29,436	therms	NJ Protocols Calculation
Fuel Cost Savings	$ 35,028		

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

2. Savings from Cooling Tower Elimination:

Motor ID	Qty*	HP**	Total HP	Existing Motor Eff.	Exist. Motor kW
Tower Fan	**1**	**30.0**	**30.0**	**93.0%**	**19.25**

*according to the facility staff, only one cooling tower runs
** Estimated cooling tower capacity

OAT - DB Avg Temp F	OAT - WB Avg Temp F	Annual Hours in Bin	Cooling Hours Bin	Fan Load %	Existing Fan kWh
92.5	75	17	17	100%	327
87.5	74	61	61	100%	1,174
82.5	72	132	132	100%	2,541
77.5	69	344	344	100%	6,623
72.5	67	566	566	100%	10,896
67.5	64	755	755	100%	14,535
62.5	62	780	780	100%	15,016
57.5	58	889	889	100%	17,115
52.5	53	742	742	0%	0
47.5	47	710	710	0%	0
42.5	43	642	642	0%	0
37.5	38	795	795	0%	0
32.5	34	784	784	0%	0
27.5	30	682	682	0%	0
22.5	25	345	345	0%	0
17.5	20	229	229	0%	0
12.5	16	189	189	0%	0
7.5	11	70	70	0%	0
2.5	6	22	22	0%	0
-2.5	2	6	6	0%	0
		8,760	**8,760**		**68,228**

3. Addition Pumping Energy Required for Ground Source Heat Pump:

Motor ID	Qty*	HP*	Total HP	Existing Motor Eff.	Exist. Motor kW	Motor Energy Usage kWh
Addition Water Pump	**1**	**10.0**	**10.0**	**91.7%**	**6.51**	**56,855**

*Estimated pump motor and pump head to overcome the additional pressure drop from the ground

Algorithms

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

Definition of Variables

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

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

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

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

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

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

EFF_B = Efficiency of baseline heaters (AFUE %)

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

Furnaces and Boilers

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

Sources:

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

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-3 Convert Water Source Heat Pump Loop to Ground Source Loop - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Water to Water Heat Pump	2	ea	$ 20,000	$ 5,000		$ 41,080	$ 12,460	$ -	$ 53,540	Estimated
Frame/ plate heat exch	1	ea	$ 10,000	$ 5,000		$ 10,270	$ 6,230	$ -	$ 16,500	Estimated
Bore field and heat pump loop pumps	2	ea	$ 5,500	$ 2,500		$ 11,297	$ 6,230	$ -	$ 17,527	Estimated
Bore Field (100 tons)	40	Ea	$ 2,500	$ 5,000	$ 5,000	$ 102,700	$ 249,200	$ 200,000	$ 551,900	Previous project
Electrical Work	1	LS	$ 10,000	$ 25,000		$ 10,270	$ 31,150	$ -	$ 41,420	Estimated
Controls	1	LS	$ 5,000	$ 10,000		$ 5,135	$ 12,460	$ -	$ 17,595	Estimated
TAB	1	LS		$ 5,000		$ -	$ 6,230	$ -	$ 6,230	Estimated
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

$	704,712	Subtotal
$	176,178	25% Contingency
$	**880,890**	**Total**

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

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-4 Install Demand Control Ventilation on RTUs

AIR HANDLER	AREA SERVED	CFM	OA CFM	% OA	
Carrier RTU	Gymnasium	600	180	30%	<<Estimated
Carrier RTU	Gymnasium	600	180	30%	<<Estimated
AAON RTU	Cafeteria	400	120	30%	<<Estimated
Carrier RTU	Auditorium	700	210	30%	<<Estimated
			690	*CFM*	

ECM 6: Demand Controlled Ventilation

ECM Description: This ECM evaluates the energy savings associated with reducing the quantity of outdoor air being introduced to large space(s) such as gymnasiums, cafeterias and auditoriums. The reduction in outdoor air ventilation is achieved using carbon dioxide sensors installed within the space(s) that monitor the amount of CO2 being expelled by the occupants. The CO2 level threshold is measured against the CO2 level in the outdoor air and is maintianed at 700 parts per million(ppm) in accordance with ASHRAE guidelines.

Electric Cost	$ 0.15	/kWh
Natural Gas Cost	$ 1.19	/therm
Facility Ventilation Heating Load	26,082	BTU/Hour[1,2,3]
Facility Ventilation Cooling Load	7,452	BTU/Hour[1,2,3]
Existing Ventilation Heating Usage	1,441	Therms[2]
Existing Ventilation Cooling Usage	11,722	kWh[3]
Proposed Ventilation Heating Usage	1,369	Therms[7]
Proposed Ventilation Cooling Usage	11,136	kWh[7]
Total heating savings	72	**Therms**
Total cooling savings	586	**kWh**
Total cost savings	$ 171	
Estimated Total Project Cost	$12,700	[8]
Simple Payback	74.1	**years**

Note: costs are used for enrgy savings calulations only. Do not use for procurment

Assumptions

1	690	OA AHU airflow based exsiting equipment model numbers
2	35	°F, Assumed average heating Δt (mixed air and supply)
3	10	°F, Assumed average cooling Δt (mixed air and supply)
4	81%	Heating Efficiency - %
5	1.2	Cooling Efficiency - kW/Ton
6	4,474	AHU run time per heating/cooling season bin data
7	5%	Estimated savings for DCV based on NJ Protocols
8	$ 12,700	estimated measure cost for installation of sensors and associated controls

Pittsgrove Township School - Arthur Schalick High School
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ECM 6: Demand Controlled Ventilation - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Re-Program HVAC Controls to allow DCV	1	EA	$ -	$ 2,500		$ -	$ 3,115	$ -	$ 3,115	RS Means 2012
CO2 Sensor	4	EA	$ 500	$ 1,000		$ 2,054	$ 4,984	$ -	$ 7,038	RS Means 2012
						$ -	$ -	$ -	$ -	

$ 10,153	Subtotal
$ 2,538	25% Contingency
$ 12,700	**Total**

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

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-5 Replace One Electric DHW Heater with a Condensing Gas Fired Heater

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

Item	Value	Units	Formula/Comments
Occupied days per week	5	days/wk	
Occupied weeks per year	52	week/yr	
Water supply Temperature	55	˚F	Termperature of water coming into building
Hot Water Temperature	120	˚F	
Hot Water Usage per day	146	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	20,501	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	50	Gallons	Per manufacturer nameplate
Hot Water Temperature	120	˚F	Per building personnel
Average Room Temperature	72	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.5	MBH	
Annual Standby Hot Water Load	4,380	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	24,881	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	100%		Per Manufacturer
Total Annual Energy Required	24,881	Mbtu/yr	
Total Annual Electric Required	**7,290**	**kWh/yr**	**Electrical Savings**
Average Annual Electric Demand	0.83	kW	
Peak Electric Demand	**4.50**	**kW**	Rated 4.5 kW Heater
New Tank Size	50	Gallons	
Hot Water Temperature	120	˚F	
Average Room Temperature	72	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.5	MBH	
Annual Standby Hot Water Load	4,380	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	24,881	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Navien CR180 instantaneous, condensing DHW Heater
Proposed Total Annual Energy Required	25,917	MBTU/yr	
Proposed Fuel Use	259	Therms/yr	Standby Losses and inefficient DHW heater eliminated
Elec Utility Demand Unit Cost	$5.97	$/kW	
Elec Utility Supply Unit Cost	$0.12	$/kWh	
NG Utility Unit Cost	$1.19	$/Therm	
Existing Operating Cost of DHW	$1,212	$/yr	
Proposed Operating Cost of DHW	$308	$/yr	
Annual Utility Cost Savings	**$903**	**$/yr**	

Daily Hot Water Demand

			#USES PER DAY		FULL TIME OCCUPANTS**				
FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	MALE	FEMALE	MALE	FEMALE	TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
LAVATORY	2.5	0.25	1	1	180	185	228	50%	114
SHOWER	2.5	5	0	0	0	0	0	75%	0
KITCHEN SINK	2.5	0.5	0	3	0	5	19	75%	14
MOP SINK	2.5	2	1	1	1	1	10	75%	8
Dishwasher (gal per use)	10	1	0	1	0	1	10	100%	10
						TOTAL	257		**146**

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

Pittsgrove Township School - Arthur Schalick High School
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ECM-5 Replace One Electric DHW Heater with a Condensing Gas Fired Heater - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
DHW Heater Removal	1	LS		$ 50		$ -	$ 62	$ -	$ 62	RS Means 2012
50 gallon High Efficiency Gas-Fired DHW Heater	1	EA	$ 5,500	$ 1,000		$ 5,649	$ 1,246	$ -	$ 6,895	From Internet Price/ Estimated Labor Cost*
Miscellaneous Electrical	1	LS	$ 300			$ 308	$ -	$ -	$ 308	RS Means 2012
Venting Kit	1	EA	$ 450	$ 650		$ 462	$ 810	$ -	$ 1,272	RS Means 2012
Miscellaneous Piping and Valves	1	LS	$ 2,000	$ 2,000		$ 2,054	$ 2,492	$ -	$ 4,546	Estimated

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

$ 13,083	Subtotal
$ 3,271	25% Contingency
$ 16,354	**Total**

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-6 Kitchen Hood Control

Description: This ECM evaluates the thermal and electrical energy savings associated with the implementation of a variable flow controlled exhaust hood (Fan) and make-up air unit. The Hood controller uses infrared heat sensors to detect the level of smoke produced by the cooking operations and automatically adjsustes the exhasut fan and make-up air fan to provide the proper amount of air flow needed to remove the particulate from the hood. The system uses a default minimum air flow value to ensure that smoke particulate is removed at all times during cooking operations.

Item	Value	Units	Formula/Comments	
Fuel Cost	$ 1.19	/ Therm		
Electricity Cost	$ 0.15	/kWh		
FORMULA CONSTANTS				
Conversion	0.746	HP/kW		
Constant	24	hrs/day		
Constant	1.08	(btu/hr)/CFM·F		
Conversion	3,412	btu/kWh		
ELECTRIC FAN SAVINGS				
Facility Type	School			
Quantity of Kitchen Hood Fan Motors	1			Q
Kitchen Hood Fan Motor HP	1.0	HP	Estimated	HP
Motor Load Factor	0.90		NJ Protocols	LF
Efficiency of Fan Motor(s)	87.5%			FEFF
Kitchen Hood Fan Run Hours	2,080			RH
Fan Motor Power Reduction (From VFD)	0.584			PR
Fan Electricity Savings	932	kWh		
HEATING SAVINGS				
Kitchen is Heated?	Y			
Square Footage of Kitchen	800	ft^2	Estimated	SF
Code Required Ventilation Rate	0.70	CFM/ft^2	NJ Protocols	CFM/SF
Ventilation Oversize Factor	1.40		NJ Protocols	OF
Flow Reductuion (from VFD/Control)	0.310			FR
Heating Degree Day	2,783		NJ Protocols Table	HDD
Heating System Efficiency	80%		AFUE (%)	HEFF
Heating Savings	219	MMbtu		
Heating Savings	2,191	Therms		
COOLING SAVINGS				
Kitchen is Cooled?	Y			
Cooling Degree Day	893		NJ Protocols Table	CDD
Cooling System Efficiency	3.00		COP	CEFF
Cooling Savings	550	kWh		
TOTAL SAVINGS				
Electricity Savings	1,482	kWh		
Fuel Savings	2,191	Therms		
Cost Savings	$ 2,824			

Savings calculation formulas are taken from NJ Protocols document for Kitchen Hood

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-6 Kitchen Hood Control - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
MeLink Kitchen Hood Control System	1	ea	$ 9,500	$ 5,000		$ 9,757	$ 6,230	$ -	$ 15,987	Vendor Est
1.0 HP VFDs (1-exhaust fan)	1	ea	$ 1,575	$ 431		$ 1,618	$ 536	$ -	$ 2,154	RS Means 2012
1.0 HP Motor	1	ea	$ 245	$ 79		$ 251	$ 98	$ -	$ 349	RS Means 2012
Reprogram DDC system	1	ea	$ 100	$ 1,200		$ 103	$ 1,495	$ -	$ 1,598	RS Means 2012
Electrical - misc.	1	ls	$ 1,000	$ 1,000		$ 1,027	$ 1,246	$ -	$ 2,273	RS Means 2012
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

$ 22,361	Subtotal
$ 5,590	25% Contingency
$ 27,951	**Total**

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

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-7 Walk-in Cooler & Freezer EC Motor Retrofits

ECM Description :
For kitchens that contain walk-in coolers and freezers, CoolTrol is a controller that reduces energy consumption by controlling off of dewpoint temperature. Compressor cycling is reduced and the evaporator fans run 25% to 80% less. Door and frame heaters are also installed and controlled by store dew point temperature; this can reduce run time by up to 95% in coolers and 60% in freezers. The evaporator fan motors are also replaced with hi-efficiency fan motors saving 40% to 70% in energy. The proposed system comprises of an anti-sweat door controller, evaporator fan motor replacement and CoolTrol Cooler Control System.

Utility Cost

$0.15 $/kWh Blended

EXISTING CONDITIONS			
Walk-In Freezer(s)			
Existing Freezer Controls?	N		
Quantity of Walk-In Freezers	2		
Nameplate Amps of Freezer Evaporator Fan	3.3		AmpsEF
Nameplate Volts of Freezer Evaporator Fan	208		VoltsEF
Phase of Evaporator Fan	1		PhaseEF
Power Factor of Evaporator Fan	0.55		PFEF
Operating Hours	8,760	hrs	
Load Reduction	65%		LR
Electricity Savings (Evaporator Fan)	4,299	kWh	kWhEF
Electricity Savings (Evaporator Fan Reduced Heat)	1,926	kWh	kWhRH
Total Walk-In Freezer(s) Electricity Savings	6,225	kWh	
Walk-In Cooler(s)			
Existing Cooler Controls?	N		
Quantity of Walk-In Coolers	1		
Nameplate Amps of Cooler Evaporator Fan	3.3		
Nameplate Volts of Cooler Evaporator Fan	208		
Phase of Evaporator Fan	1		
Power Factor of Evaporator Fan	0.55		
Operating Hours	8,760	hrs	
Load Reduction	65%		
Electricity Savings (Evaporator Fan)	2,150	kWh	
Electricity Savings (Evaporator Fan Reduced Heat)	963	kWh	
Total Walk-In Cooler(s) Electricity Savings	3,113	kWh	
SAVINGS			
Total Electricity Savings	**9,338**	**kWh**	
Total Cost Savings	**$ 1,363**		
Estimated Cost	$ 20,625		
Simple Payback	15.1	**years**	

Savings calculation formulas are taken from NJ Protocols document for Walk-in Controller

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

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

ECM-7 Walk-in Cooler & Freezer EC Motor Retrofits - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									$ -	
Turnkey Walk-In Controller & Equipment	1	EA	$ 10,000	$ 5,000	$ -	$ 10,270	$ 6,230	$ -	$ 16,500	Vendor Estimate
						$ -	$ -	$ -	$ -	

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

$ 16,500	Subtotal
$ 4,125	25% Contingency
$ 20,625	**Total**

Pittsgrove Township School - Arthur Schalick High School
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Arthur Schalick High School

ECM-8 Install Vending Misers

Description : Vending machines generally operate 24/7 regardless of the actual usage. This measure proposes installing vending machine controls to reduce the total run time of these units. Cold beverage machines will cycle on for 15 minutes every two hours in order to keep beverages at a desired temperature. The result is a reduction in total electrical energy usage.

Unit Cost: $0.146 $/kWh blended

Energy Savings Calculations:

	Existing	
Cold Beverage Vending Machine Electric usage	7,008	kWh[1,4,7]
Snack Vending Machine Electric usage	1,752	kWh[2,5,7]
Dual Vending Machine Electric Usage	-	kWh[3,6,7]
Total Vending Machine Electric Usage	8,760	kWh

	Proposed	
Cold Beverage Vending Machine Electric usage	756	kWh[8]
Snack Vending Machine Electric usage	216	kWh
Dual Vending Machine Electric Usage	0	kWh
Total Vending Machine Electric Usage	972	kWh[9]

Vending Machine Controls Usage Savings	**7,788**	**kWh**
Total cost savings	**$ 1,137**	
Estimated Total Project Cost	**$ 840**	
Simple Payback	**1**	**years**

Assumptions

1	2	Number of cold beverage vending machines
2	1	Number of snack vending machines
3	0	Number of dual snack/beverage vending machines
4	400	Average wattage, typical of cold beverage machines based on prior project experience
5	200	Average wattage, typical of snack machines based on prior project experience
6	300	Average wattage, typical of dual snack/beverage machines based on prior project experience
7	8760	Hours per year vending machine plugged in
8	2160	Building Occupied Hours
9	0.50	Vending Machine Traffic Factor (0.75 for High Traffic, 0.5 for Medium, 0.25 for low)

Pittsgrove Township School - Arthur Schalick High School
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Arthur Schalick High School

ECM-8 Install Vending Misers - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									$ -	
Vending Miser	3	EA	$ 200	$ 15	$ -	$ 616	$ 56	$ -	$ 672	Vendor Estimation
						$ -	$ -	$ -	$ -	

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

$ 672	Subtotal
$ 168	25% Contingency
$ 840	**Total**

Pittsgrove Township School - Arthur Schalick High School
CHA Project Numer: 28484
Arthur Schalick High School

New Jersey Pay For Performance Incentive Program

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per April, 2012.
Building must have a minimum average electric demand of 100 kW. This minimum is waived for buildings owned by local governements or non-profit organizations.

At a minimum, all recommended measures were used for this calculation. To qualify for P4P incentives, the following P4P requirements must be met:

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

Total Building Area (Square Feet)	112,000
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)	$217,205	$46,904
Existing Usage (from utility)	1,492,963	39,423
Proposed Savings	213,924	5,531
Existing Total MMBtus	9,038	
Proposed Savings MMBtus	1,283	
% Energy Reduction	**14.2%**	
Proposed Annual Savings	$37,153	

	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

	Incentives $		
	Elec	Gas	Total
Incentive #1	$0	$0	$0
Incentive #2	$0	$0	$0
Incentive #3	$0	$0	$0
Total All Incentives	**$0**	**$0**	**$0**

Total Project Cost	$549,330

		Allowable Incentive
% Incentives #1 of Utility Cost*	0.0%	$0
% Incentives #2 of Project Cost**	0.0%	$0
% Incentives #3 of Project Cost**	0.0%	$0
Total Eligible Incentives***	**$0**	
Project Cost w/ Incentives	$549,330	

Project Payback (years)	
w/o Incentives	w/ Incentives
14.8	14.8

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

Energy Audit of Pittsgrove Township Schools - Arthur Schalick High School
CHA Project No. 28484
ECM-L1 Lighting Replacements

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
40LED	Room 101	15	T 32 R F 2 (ELE)	F42LL	60	0.9	SW	2600	2,340	15	T 38 R LED	RTLED38	38	0.6	SW	2,600	1,482	858	0.3	$ 128.31	$ 3,543.75	$750	27.6	21.8
40LED	Room 102	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	2600	936	6	T 38 R LED	RTLED38	38	0.2	SW	2,600	593	343	0.1	$ 51.33	$ 1,417.50	$300	27.6	21.8
40LED	Room 103	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	T 38 R LED	RTLED38	38	0.2	SW	2,600	395	229	0.1	$ 34.22	$ 945.00	$200	27.6	21.8
40LED	Room 104	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	SW	2,600	889	515	0.2	$ 76.99	$ 2,126.25	$450	27.6	21.8
40LED	Room 105	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	SW	2,600	889	515	0.2	$ 76.99	$ 2,126.25	$450	27.6	21.8
40LED	Room 106	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	SW	2,600	889	515	0.2	$ 76.99	$ 2,126.25	$450	27.6	21.8
40LED	Room 107	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	SW	2,600	889	515	0.2	$ 76.99	$ 2,126.25	$450	27.6	21.8
40LED	Room 108	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	SW	2,600	889	515	0.2	$ 76.99	$ 2,126.25	$450	27.6	21.8
40LED	Room 109	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	SW	2,600	889	515	0.2	$ 76.99	$ 2,126.25	$450	27.6	21.8
40LED	Room 110	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	SW	2,600	889	515	0.2	$ 76.99	$ 2,126.25	$450	27.6	21.8
40LED	Room 111	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	SW	2,600	889	515	0.2	$ 76.99	$ 2,126.25	$450	27.6	21.8
40LED	Corridor	30	T 32 R F 2 (ELE)	F42LL	60	1.8	SW	6240	11,232	30	T 38 R LED	RTLED38	38	1.1	SW	6,240	7,114	4,118	0.7	$ 549.72	$ 7,087.50	$1,500	12.9	10.2
40LED	Work Room	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	T 38 R LED	RTLED38	38	0.2	SW	2,600	395	229	0.1	$ 34.22	$ 945.00	$200	27.6	21.8
198	Work Room	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.0	SW	2600	81	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.0	SW	2,600	81	-	0.0	$ -	$ -	$0		0.0
40LED	Exam Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	SW	2,600	198	114	0.0	$ 17.11	$ 472.50	$100	27.6	21.8
40LED	Nurse Room and Rest Area	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	2600	1,092	7	T 38 R LED	RTLED38	38	0.3	SW	2,600	692	400	0.2	$ 59.88	$ 1,653.75	$350	27.6	21.8
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	SW	2,600	198	114	0.0	$ 17.11	$ 472.50	$100	27.6	21.8
198LED	Waiting Room	22	2T 17 R F 2 (ELE)	F22LL	31	0.7	SW	2600	1,773	22	2T 25 R LED	2RTLED	25	0.6	SW	2,600	1,430	343	0.1	$ 51.33	$ 4,455.00	$1,100	86.8	65.4
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	SW	2,600	198	114	0.0	$ 17.11	$ 472.50	$100	27.6	21.8
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	SW	2,600	198	114	0.0	$ 17.11	$ 472.50	$100	27.6	21.8
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	SW	2,600	198	114	0.0	$ 17.11	$ 472.50	$100	27.6	21.8
40LED	VP Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	SW	2,600	198	114	0.0	$ 17.11	$ 472.50	$100	27.6	21.8
198LED	Record Room	5	2T 17 R F 2 (ELE)	F22LL	31	0.2	SW	2600	403	5	2T 25 R LED	2RTLED	25	0.1	SW	2,600	325	78	0.0	$ 11.66	$ 1,012.50	$250	86.8	65.4
198LED	General Office	16	2T 17 R F 2 (ELE)	F22LL	31	0.5	SW	2600	1,290	16	2T 25 R LED	2RTLED	25	0.4	SW	2,600	1,040	250	0.1	$ 37.33	$ 3,240.00	$800	86.8	65.4
198LED	Conference Room	5	2T 17 R F 2 (ELE)	F22LL	31	0.2	SW	1560	242	5	2T 25 R LED	2RTLED	25	0.1	SW	1,560	195	47	0.0	$ 7.86	$ 1,012.50	$250	128.8	97.0
198LED	Principle Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322	4	2T 25 R LED	2RTLED	25	0.1	SW	2,600	260	62	0.0	$ 9.33	$ 810.00	$200	86.8	65.4
198LED	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322	4	2T 25 R LED	2RTLED	25	0.1	SW	2,600	260	62	0.0	$ 9.33	$ 810.00	$200	86.8	65.4
198LED	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322	4	2T 25 R LED	2RTLED	25	0.1	SW	2,600	260	62	0.0	$ 9.33	$ 810.00	$200	86.8	65.4
24LED	Room 401	5	1B 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780	5	4 ft LED Tube	200732x2	30	0.2	SW	2,600	390	390	0.2	$ 58.32	$ 1,168.50	$175	20.0	17.0
24LED	Room 402	5	1B 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780	5	4 ft LED Tube	200732x2	30	0.2	SW	2,600	390	390	0.2	$ 58.32	$ 1,168.50	$175	20.0	17.0
24LED	Room 403	10	1B 32 P F 2 (ELE)	F42LL	60	0.6	SW	2600	1,560	10	4 ft LED Tube	200732x2	30	0.3	SW	2,600	780	780	0.3	$ 116.65	$ 2,337.00	$350	20.0	17.0
24LED	Room 404	15	1B 32 P F 2 (ELE)	F42LL	60	0.9	SW	2600	2,340	15	4 ft LED Tube	200732x2	30	0.5	SW	2,600	1,170	1,170	0.5	$ 174.97	$ 3,505.50	$525	20.0	17.0
24LED	Room 405	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	SW	2,600	702	702	0.3	$ 104.98	$ 2,103.30	$315	20.0	17.0
24LED	Room 406	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	SW	2,600	702	702	0.3	$ 104.98	$ 2,103.30	$315	20.0	17.0
24LED	Room 407	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	SW	2,600	702	702	0.3	$ 104.98	$ 2,103.30	$315	20.0	17.0
24LED	Room 408	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	SW	2,600	702	702	0.3	$ 104.98	$ 2,103.30	$315	20.0	17.0
24LED	Room 409	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	SW	2,600	702	702	0.3	$ 104.98	$ 2,103.30	$315	20.0	17.0
24LED	Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	4 ft LED Tube	200732x2	30	0.1	SW	2,600	156	156	0.1	$ 23.33	$ 467.40	$70	20.0	17.0
24LED	Corridor	8	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	2,995	8	4 ft LED Tube	200732x2	30	0.2	SW	6,240	1,498	1,498	0.2	$ 199.90	$ 1,869.60	$280	9.4	8.0
212	Library	50	T 32 R F 4 (ELE) (TWO SWITCH)	F44ILL	112	5.6	SW	3120	17,472	50	T 32 R F 4 (ELE) (TWO SWITCH)	F44ILL	112	5.6	SW	3,120	17,472	-	0.0	$ -	$ -	$0		0.0
35LED	Room 200	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212	18	T 59 R LED	RTLED38	38	0.7	SW	2,600	1,778	2,434	0.9	$ 363.94	$ 4,252.50	$0	11.7	11.7
35LED	Room 201	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808	12	T 59 R LED	RTLED38	38	0.5	SW	2,600	1,186	1,622	0.6	$ 242.63	$ 2,835.00	$0	11.7	11.7
35LED	Room 202	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212	18	T 59 R LED	RTLED38	38	0.7	SW	2,600	1,778	2,434	0.9	$ 363.94	$ 4,252.50	$0	11.7	11.7
35LED	Room 203	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808	12	T 59 R LED	RTLED38	38	0.5	SW	2,600	1,186	1,622	0.6	$ 242.63	$ 2,835.00	$0	11.7	11.7
35LED	Room 204	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	SW	2,600	593	811	0.3	$ 121.31	$ 1,417.50	$0	11.7	11.7
35LED	Room 205 L	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	SW	2,600	593	811	0.3	$ 121.31	$ 1,417.50	$0	11.7	11.7
35LED	Room 205 C	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	SW	2,600	593	811	0.3	$ 121.31	$ 1,417.50	$0	11.7	11.7
35LED	Room 206	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	SW	2,600	593	811	0.3	$ 121.31	$ 1,417.50	$0	11.7	11.7
35LED	Room 207	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510	15	T 59 R LED	RTLED38	38	0.6	SW	2,600	1,482	2,028	0.8	$ 303.29	$ 3,543.75	$0	11.7	11.7
35LED	Room 208	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808	12	T 59 R LED	RTLED38	38	0.5	SW	2,600	1,186	1,622	0.6	$ 242.63	$ 2,835.00	$0	11.7	11.7
35LED	Room 209	10	T 32 R F 3 (ELE)	F43ILL/2	90	0.9	SW	2600	2,340	10	T 59 R LED	RTLED38	38	0.4	SW	2,600	988	1,352	0.5	$ 202.19	$ 2,362.50	$0	11.7	11.7
35LED	Room 211	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510	15	T 59 R LED	RTLED38	38	0.6	SW	2,600	1,482	2,028	0.8	$ 303.29	$ 3,543.75	$0	11.7	11.7
35LED	Room 212	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510	15	T 59 R LED	RTLED38	38	0.6	SW	2,600	1,482	2,028	0.8	$ 303.29	$ 3,543.75	$0	11.7	11.7
24LED	Room 212 Storage	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	SW	2,600	702	702	0.3	$ 104.98	$ 2,103.30	$315	20.0	17.0
35LED	Room 213	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808	12	T 59 R LED	RTLED38	38	0.5	SW	2,600	1,186	1,622	0.6	$ 242.63	$ 2,835.00	$0	11.7	11.7
35LED	Room 215	24	T 32 R F 3 (ELE)	F43ILL/2	90	2.2	SW	2600	5,616	24	T 59 R LED	RTLED38	38	0.9	SW	2,600	2,371	3,245	1.2	$ 485.26	$ 5,670.00	$0	11.7	11.7
35LED	Room 217	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212	18	T 59 R LED	RTLED38	38	0.7	SW	2,600	1,778	2,434	0.9	$ 363.94	$ 4,252.50	$0	11.7	11.7
24LED	Corridor	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	3,370	9	4 ft LED Tube	200732x2	30	0.3	SW	6,240	1,685	1,685	0.3	$ 224.89	$ 2,103.30	$315	9.4	8.0
18LED	Stage	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	3120	2,097	6	T 74 R LED	RTLED50	50	0.3	SW	3,120	936	1,161	0.4	$ 168.24	$ 1,417.50	$0	8.4	8.4
217	Auditorium	23	2B 17 C F 2 (ELE)	F22ILL	33	0.8	SW	3120	2,368	23	2B 17 C F 2 (ELE)	F22ILL	33	0.8	SW	3,120	2,368	-	0.0	$ -	$ -	$0		0.0
24LED	Lobby	8	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	2,995	8	4 ft LED Tube	200732x2	30	0.2	SW	6,240	1,498	1,498	0.2	$ 199.90	$ 1,869.60	$280	9.4	8.0
196	Weight Room	12	W 32 C F 4 (ELE)	F44ILL	112	1.3	SW	3120	4,193	12	W 28 C F 4	F44SSILL	96	1.2	SW	3,120	3,594	599	0.2	$ 86.84	$ 1,701.00	$120	19.6	18.2
169LED	Dance Studio	24	WP 250 MH	MH250/1	295	7.1	SW	3120	22,090	24	FXLED78	FXLED78/1	78	1.9	SW	3,120	5,841	16,249	5.2	$ 2,355.41	$ 20,260.69	$4,200	8.6	6.8
199	Weight Room Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	100	2	W 28 C F 1	F41SSILL	26	0.1	SW	1,560	81	19	0.0	$ 3.14	$ 229.50	$20	73.0	66.6
24LED	Therapy Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	749	4	4 ft LED Tube	200732x2	30	0.1	SW	3,120	374	374	0.1	$ 54.27	$ 934.80	$140	17.2	14.6
18LED	Cafeteria	54	T 32 R F 4 (ELE)	F44ILL	112	6.0	SW	2600	15,725	54	T 74 R LED	RTLED50	50	2.7	SW	2,600	7,020	8,705	3.3	$ 1,301.80	$ 12,757.50	$0	9.8	9.8
35LED	Corridor	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	6240	3,370	6	T 59 R LED	RTLED38	38	0.2	SW	6,240	1,423	1,947	0.3	$ 259.87	$ 1,417.50	$0	5.5	5.5
18LED	Kitchen	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2600	2,621	9	T 74 R LED	RTLED50	50	0.5	SW	2,600	1,170	1,451	0.6	$ 216.97	$ 2,126.25	$0	9.8	9.8
18LED	Food Dry	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2600	874	3	T 74 R LED	RTLED50	50	0.2	SW	2,600	390	484	0.2	$ 72.32	$ 708.75	$0	9.8	9.8
18LED	Corridor	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	6240	4,193	6	T 74 R LED	RTLED50	50	0.3	SW	6,240	1,872	2,321	0.4	$ 309.84	$ 1,417.50	$0	4.6	4.6
24LED	Boiler Room	17	1B 32 P F 2 (ELE)	F42LL	60	1.0	SW	6240	6,365	17	4 ft LED Tube	200732x2	30	0.5	SW	6,240	3,182	3,182	0.5	$ 424.78	$ 3,972.90	$595	9.4	8.0
24LED	Boys Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	749	4	4 ft LED Tube	200732x2	30	0.1	SW	3,120	374	374	0.1	$ 54.27	$ 934.80	$140	17.2	14.6
24LED	Girls Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	749	4	4 ft LED Tube	200732x2	30	0.1	SW	3,120	374	374	0.1	$ 54.27	$ 934.80	$140	17.2	14.6
24LED	Corridor	27	1B 32 P F 2 (ELE)	F42LL	60	1.6	SW	6240	10,109	27	4 ft LED Tube	200732x2	30	0.8	SW	6,240	5,054	5,054	0.8	$ 674.66	$ 6,309.90	$945	9.4	8.0
35LED	Room 301	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106	9	T 59 R LED	RTLED38	38	0.3	SW	2,600	889	1,217	0.5	$ 181.97	$ 2,126.25	$0	11.7	11.7
18LED	Room 302	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	2600	1,747	6	T 74 R LED	RTLED50	50	0.3	SW	2,600	780	967	0.4	$ 144.64	$ 1,417.50	$0	9.8	9.8
202	Room 303	6	2T 17 R F 4 (ELE)	F22ILL	33	0.2	SW	2600	515	6	2T 17 R F 4 (ELE)	F22ILL	33	0.2	SW	2,600	515	-	0.0	$ -	$ -	$0		0.0
35LED	SCI	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	SW	2,600	593	811	0.3	$ 121.31	$ 1,417.50	$0	11.7	11.7
35LED	Room 603	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	2600	936	4	T 59 R LED	RTLED38	38	0.2	SW	2,600	395	541	0.2	$ 80.88	$ 945.00	$0	11.7	11.7
35LED	Room 602	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2600	702	3	T 59 R LED	RTLED38	38	0.1	SW	2,600	296	406	0.2	$ 60.66	$ 708.75	$0	11.7	11.7
35LED	Room 309	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	SW	2,600	593	811	0.3	$ 121.31	$ 1,417.50	$0	11.7	11.7
35LED	Room 301	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106	9	T 59 R LED	RTLED38	38	0.3	SW	2,600	889	1,217	0.5	$ 181.97	$ 2,126.25	$0	11.7	11.7
40LED	Room 311	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	T 38 R LED	RTLED38	38	0.2	SW	2,600	395	229	0.1	$ 34.22	$ 945.00	$200	27.6	21.8
40LED	Room 311 Storage	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1560	374	4	T 38 R LED	RTLED38	38	0.2	SW	1,560	237	137	0.1	$ 23.05	$ 945.00	$200	41.0	32.3
35LED	Room 315	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106	9	T 59 R LED	RTLED38	38	0.3	SW	2,600	889	1,217	0.5	$ 181.97	$ 2,126.25	$0	11.7	11.7
35LED	Room 313	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106	9	T 59 R LED	RTLED38	38	0.3	SW	2,600	889	1,217	0.5	$ 181.97	$ 2,126.25	$0	11.7	11.7
199	Boys Locker Room	28	W 32 C F 1 (ELE)	F41LL	32	0.9	SW	3120	2,796	28	W 28 C F 1	F41SSILL	26	0.7	SW	3,120	2,271	524	0.2	$ 75.98	$ 3,213.00	$280	42.3	38.6
24LED	PE Office	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	4 ft LED Tube	200732x2	30	0.1	SW	2,600	312	312	0.1	$ 46.66	$ 934.80	$140	20.0	17.0
24LED	Coach Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	4 ft LED Tube	200732x2	30	0.1	SW	2,600	156	156	0.1	$ 23.33	$ 467.40	$70	20.0	17.0
199	Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	100	2	W 28 C F 1	F41SSILL	26	0.1	SW	1,560	81	19	0.0	$ 3.14	$ 229.50	$20	73.0	66.6
24LED	Shower	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	562	3	4 ft LED Tube	200732x2	30	0.1	SW	3,120	281	281	0.1	$ 40.70	$ 701.10	$105	17.2	14.6
206	Shower	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	SW	3120	646	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	SW	3,120	646	-	0.0	$ -	$ -	$0		0.0
24LED	Restroom	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	3120	374	2	4 ft LED Tube	200732x2	30	0.1	SW	3,120	187	187	0.1	$ 27.14	$ 467.40	$70	17.2	14.6
24LED	Team Room	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	562	3	4 ft LED Tube	200732x2	30	0.1	SW	3,120	281	281	0.1	$ 40.70	$ 701.10	$105	17.2	14.6
199	Girls Locker Room	28	W 32 C F 1 (ELE)	F41LL	32	0.9	SW	3120	2,796	28	W 28 C F 1	F41SSILL	26	0.7	SW	3,120	2,271	524	0.2	$ 75.98	$ 3,213.00	$280	42.3	38.6
24LED	PE Office	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	4 ft LED Tube	200732x2	30	0.1	SW	2,600	312	312	0.1	$ 46.66	$ 934.80	$140	20.0	17.0
24LED	Coach Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	4 ft LED Tube	200732x2	30	0.1	SW	2,600	156	156	0.1	$ 23.33	$ 467.40	$70	20.0	17.0
199	Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	100	2	W 28 C F 1	F41SSILL	26	0.1	SW	1,560	81	19	0.0	$ 3.14	$ 229.50	$20	73.0	66.6
24LED	Shower	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	562	3	4 ft LED Tube	200732x2	30	0.1	SW	3,120	281	281	0.1	$ 40.70	$ 701.10	$105	17.2	14.6
206	Shower	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	SW	3120	646	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	SW	3,120	646	-	0.0	$ -	$ -	$0		0.0
24LED	Restroom	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	3120	374	2	4 ft LED Tube	200732x2	30	0.1	SW	3,120	187	187	0.1	$ 27.14	$ 467.40	$70	17.2	14.6
24LED	Team Room	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	562	3	4 ft LED Tube	200732x2	30	0.1	SW	3,120	281	281	0.1	$ 40.70	$ 701.10	$105	17.2	14.6
250	Gymnasium	30	T 54 W F 3 (ELE) (T-5)	F43GHL	177	5.3	SW	3120	16,567	30	T 54 W F 3 (ELE) (T-5)	F43GHL	177	5.3	SW	3,120	16,567	-	0.0	$ -	$ -	$0		0.0
	Total	**978**				**79.4**			**244,702**	**978**			**4,235**	**44.8**			**138,738**	**105,965**	**34.6**	**$15,409**	**$207,981**	**$22,840**		
																	Demand Savings			**34.6**	**$2,482**			
																	kWh Savings			**105,965**	**$12,928**			
																	Total savings				**$15,409**		**13.5**	**12.0**

Energy Audit of Pittsgrove Township Schools - Arthur Schalick High School
CHA Project No. 28484
ECM-L2 Install Occupancy Sensors

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(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
40LED	Room 101	15	T 32 R F 2 (ELE)	F42LL	60	0.9	SW	2600	2,340.0	15	T 32 R F 2 (ELE)	F42LL	60	0.9	C-OCC	2080	1,872.0	468.0	0.0	$57.10	$270.00	$35.00	4.7	4.1
40LED	Room 102	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	2600	936.0	6	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	1820	655.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Room 103	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624.0	4	T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	1820	436.8	187.2	0.0	$22.84	$270.00	$35.00	11.8	10.3
40LED	Room 104	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Room 105	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Room 106	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Room 107	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Room 108	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Room 109	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Room 110	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Room 111	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
40LED	Corridor	30	T 32 R F 2 (ELE)	F42LL	60	1.8	SW	6240	11,232.0	30	T 32 R F 2 (ELE)	F42LL	60	1.8	C-OCC	6240	11,232.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
40LED	Work Room	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624.0	4	T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	1820	436.8	187.2	0.0	$22.84	$270.00	$35.00	11.8	10.3
198	Work Room	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.0	SW	2600	80.6	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.0	C-OCC	1820	56.4	24.2	0.0	$2.95	$270.00	$35.00	91.5	79.7
40LED	Exam Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
40LED	Nurse Room and Rest Area	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	2600	1,092.0	7	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	1820	764.4	327.6	0.0	$39.97	$270.00	$35.00	6.8	5.9
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
198LED	Waiting Room	22	2T 17 R F 2 (ELE)	F22LL	31	0.7	SW	2600	1,773.2	22	2T 17 R F 2 (ELE)	F22LL	31	0.7	C-OCC	1820	1,241.2	532.0	0.0	$64.90	$270.00	$35.00	4.2	3.6
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
40LED	VP Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
198LED	Record Room	5	2T 17 R F 2 (ELE)	F22LL	31	0.2	SW	2600	403.0	5	2T 17 R F 2 (ELE)	F22LL	31	0.2	C-OCC	1820	282.1	120.9	0.0	$14.75	$270.00	$35.00	18.3	15.9
198LED	General Office	16	2T 17 R F 2 (ELE)	F22LL	31	0.5	SW	2600	1,289.6	16	2T 17 R F 2 (ELE)	F22LL	31	0.5	C-OCC	1820	902.7	386.9	0.0	$47.20	$270.00	$35.00	5.7	5.0
198LED	Conference Room	5	2T 17 R F 2 (ELE)	F22LL	31	0.2	SW	1560	241.8	5	2T 17 R F 2 (ELE)	F22LL	31	0.2	C-OCC	1092	169.3	72.5	0.0	$8.85	$270.00	$35.00	30.5	26.6
198LED	Principle Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322.4	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	C-OCC	1820	225.7	96.7	0.0	$11.80	$270.00	$35.00	22.9	19.9
198LED	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322.4	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	C-OCC	1820	225.7	96.7	0.0	$11.80	$270.00	$35.00	22.9	19.9
198LED	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322.4	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	C-OCC	1820	225.7	96.7	0.0	$11.80	$270.00	$35.00	22.9	19.9
24LED	Room 401	5	1B 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780.0	5	1B 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	1820	546.0	234.0	0.0	$28.55	$270.00	$35.00	9.5	8.2
24LED	Room 402	5	1B 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780.0	5	1B 32 P F 2 (ELE)	F42LL	60	0.3	C-OCC	2080	624.0	156.0	0.0	$19.03	$270.00	$35.00	14.2	12.3
24LED	Room 403	10	1B 32 P F 2 (ELE)	F42LL	60	0.6	SW	2600	1,560.0	10	1B 32 P F 2 (ELE)	F42LL	60	0.6	C-OCC	2080	1,248.0	312.0	0.0	$38.06	$270.00	$35.00	7.1	6.2
24LED	Room 404	15	1B 32 P F 2 (ELE)	F42LL	60	0.9	SW	2600	2,340.0	15	1B 32 P F 2 (ELE)	F42LL	60	0.9	C-OCC	2080	1,872.0	468.0	0.0	$57.10	$270.00	$35.00	4.7	4.1
24LED	Room 405	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
24LED	Room 406	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
24LED	Room 407	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
24LED	Room 408	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
24LED	Room 409	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
24LED	Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
24LED	Corridor	8	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	2,995.2	8	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	6240	2,995.2	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
212	Library	50	T 32 R F 4 (ELE) (TWO SWITCH)	F44ILL	112	5.6	SW	3120	17,472.0	50	T 32 R F 4 (ELE) (TWO SWITCH)	F44ILL	112	5.6	C-OCC	0	0.0	17,472.0	0.0	$2,131.58	$270.00	$35.00	0.1	0.1
35LED	Room 200	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212.0	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	C-OCC	2080	3,369.6	842.4	0.0	$102.77	$270.00	$35.00	2.6	2.3
35LED	Room 201	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808.0	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	2080	2,246.4	561.6	0.0	$68.52	$270.00	$35.00	3.9	3.4
35LED	Room 202	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212.0	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	C-OCC	2080	3,369.6	842.4	0.0	$102.77	$270.00	$35.00	2.6	2.3
35LED	Room 203	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808.0	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	2080	2,246.4	561.6	0.0	$68.52	$270.00	$35.00	3.9	3.4
35LED	Room 204	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404.0	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
35LED	Room 205 L	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404.0	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
35LED	Room 205 C	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404.0	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
35LED	Room 206	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404.0	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
35LED	Room 207	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510.0	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	2080	2,808.0	702.0	0.0	$85.64	$270.00	$35.00	3.2	2.7
35LED	Room 208	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808.0	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	2080	2,246.4	561.6	0.0	$68.52	$270.00	$35.00	3.9	3.4
35LED	Room 209	10	T 32 R F 3 (ELE)	F43ILL/2	90	0.9	SW	2600	2,340.0	10	T 32 R F 3 (ELE)	F43ILL/2	90	0.9	C-OCC	2080	1,872.0	468.0	0.0	$57.10	$270.00	$35.00	4.7	4.1
35LED	Room 211	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510.0	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	2080	2,808.0	702.0	0.0	$85.64	$270.00	$35.00	3.2	2.7
35LED	Room 212	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510.0	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	2080	2,808.0	702.0	0.0	$85.64	$270.00	$35.00	3.2	2.7
24LED	Room 212 Storage	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404.0	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
35LED	Room 213	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808.0	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	2080	2,246.4	561.6	0.0	$68.52	$270.00	$35.00	3.9	3.4
35LED	Room 215	24	T 32 R F 3 (ELE)	F43ILL/2	90	2.2	SW	2600	5,616.0	24	T 32 R F 3 (ELE)	F43ILL/2	90	2.2	C-OCC	2080	4,492.8	1,123.2	0.0	$137.03	$270.00	$35.00	2.0	1.7
35LED	Room 217	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212.0	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	C-OCC	2080	3,369.6	842.4	0.0	$102.77	$270.00	$35.00	2.6	2.3
24LED	Corridor	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	3,369.6	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	6240	3,369.6	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
18LED	Stage	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	3120	2,096.6	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	None	3120	2,096.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
217	Auditorium	23	2B 17 C F 2 (ELE)	F22ILL	33	0.8	SW	3120	2,368.1	23	2B 17 C F 2 (ELE)	F22ILL	33	0.8	None	3120	2,368.1	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
24LED	Lobby	8	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	2,995.2	8	1B 32 P F 2 (ELE)	F42LL	60	0.5	C-OCC	6240	2,995.2	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
196	Weight Room	12	W 32 C F 4 (ELE)	F44ILL	112	1.3	SW	3120	4,193.3	12	W 32 C F 4 (ELE)	F44ILL	112	1.3	None	3120	4,193.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
169LED	Dance Studio	24	WP 250 MH	MH250/1	295	7.1	SW	3120	22,089.6	24	WP 250 MH	MH250/1	295	7.1	None	3120	22,089.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
199	Weight Room Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	99.8	2	W 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1092	69.9	30.0	0.0	$3.65	$270.00	$35.00	73.9	64.3
24LED	Therapy Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	748.8	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	None	3120	748.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18LED	Cafeteria	54	T 32 R F 4 (ELE)	F44ILL	112	6.0	SW	2600	15,724.8	54	T 32 R F 4 (ELE)	F44ILL	112	6.0	None	2600	15,724.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	Corridor	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	6240	3,369.6	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	None	6240	3,369.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18LED	Kitchen	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2600	2,620.8	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	None	2600	2,620.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18LED	Food Dry	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2600	873.6	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	None	2600	873.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18LED	Corridor	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	6240	4,193.3	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	None	6240	4,193.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
24LED	Boiler Room	17	1B 32 P F 2 (ELE)	F42LL	60	1.0	SW	6240	6,364.8	17	1B 32 P F 2 (ELE)	F42LL	60	1.0	None	6240	6,364.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
24LED	Boys Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	748.8	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	2184	524.2	224.6	0.0	$27.41	$270.00	$35.00	9.9	8.6
24LED	Girls Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	748.8	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	2184	524.2	224.6	0.0	$27.41	$270.00	$35.00	9.9	8.6
24LED	Corridor	27	1B 32 P F 2 (ELE)	F42LL	60	1.6	SW	6240	10,108.8	27	1B 32 P F 2 (ELE)	F42LL	60	1.6	C-OCC	6240	10,108.8	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
35LED	Room 301	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106.0	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2080	1,684.8	421.2	0.0	$51.39	$270.00	$35.00	5.3	4.6
18LED	Room 302	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	2600	1,747.2	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	C-OCC	2080	1,397.8	349.4	0.0	$42.63	$270.00	$35.00	6.3	5.5
202	Room 303	6	2T 17 R F 4 (ELE)	F22ILL	33	0.2	SW	2600	514.8	6	2T 17 R F 4 (ELE)	F22ILL	33	0.2	C-OCC	2080	411.8	103.0	0.0	$12.56	$270.00	$35.00	21.5	18.7
35LED	SCI	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404.0	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
35LED	Room 603	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	2600	936.0	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	C-OCC	2080	748.8	187.2	0.0	$22.84	$270.00	$35.00	11.8	10.3
35LED	Room 602	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2600	702.0	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	C-OCC	2080	561.6	140.4	0.0	$17.13	$270.00	$35.00	15.8	13.7
35LED	Room 309	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404.0	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2080	1,123.2	280.8	0.0	$34.26	$270.00	$35.00	7.9	6.9
35LED	Room 301	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106.0	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2080	1,684.8	421.2	0.0	$51.39	$270.00	$35.00	5.3	4.6
40LED	Room 311	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624.0	4	T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	2080	499.2	124.8	0.0	$15.23	$270.00	$35.00	17.7	15.4
40LED	Room 311 Storage	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1560	374.4	4	T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	1092	262.1	112.3	0.0	$13.70	$270.00	$35.00	19.7	17.1
35LED	Room 315	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106.0	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2080	1,684.8	421.2	0.0	$51.39	$270.00	$35.00	5.3	4.6
35LED	Room 313	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106.0	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2080	1,684.8	421.2	0.0	$51.39	$270.00	$35.00	5.3	4.6
199	Boys Locker Room	28	W 32 C F 1 (ELE)	F41LL	32	0.9	SW	3120	2,795.5	28	W 32 C F 1 (ELE)	F41LL	32	0.9	C-OCC	2184	1,956.9	838.7	0.0	$102.32	$270.00	$35.00	2.6	2.3
24LED	PE Office	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	624.0	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	1820	436.8	187.2	0.0	$22.84	$270.00	$35.00	11.8	10.3
24LED	Coach Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
199	Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	99.8	2	W 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1092	69.9	30.0	0.0	$3.65	$270.00	$35.00	73.9	64.3
24LED	Shower	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	561.6	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	2184	393.1	168.5	0.0	$20.55	$270.00	$35.00	13.1	11.4
206	Shower	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	SW	3120	645.8	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	C-OCC	2184	452.1	193.8	0.0	$23.64	$270.00	$35.00	11.4	9.9
24LED	Restroom	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	3120	374.4	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	2184	262.1	112.3	0.0	$13.70	$270.00	$35.00	19.7	17.1
24LED	Team Room	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	561.6	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	2184	393.1	168.5	0.0	$20.55	$270.00	$35.00	13.1	11.4
199	Girls Locker Room	28	W 32 C F 1 (ELE)	F41LL	32	0.9	SW	3120	2,795.5	28	W 32 C F 1 (ELE)	F41LL	32	0.9	C-OCC	2184	1,956.9	838.7	0.0	$102.32	$270.00	$35.00	2.6	2.3
24LED	PE Office	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	624.0	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	1820	436.8	187.2	0.0	$22.84	$270.00	$35.00	11.8	10.3
24LED	Coach Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312.0	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	1820	218.4	93.6	0.0	$11.42	$270.00	$35.00	23.6	20.6
199	Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	99.8	2	W 32 C F 1 (ELE)	F41LL	32	0.1	C-OCC	1092	69.9	30.0	0.0	$3.65	$270.00	$35.00	73.9	64.3
24LED	Shower	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	561.6	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	2184	393.1	168.5	0.0	$20.55	$270.00	$35.00	13.1	11.4
206	Shower	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	SW	3120	645.8	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	C-OCC	2184	452.1	193.8	0.0	$23.64	$270.00	$35.00	11.4	9.9
24LED	Restroom	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	3120	374.4	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	C-OCC	2184	262.1	112.3	0.0	$13.70	$270.00	$35.00	19.7	17.1
24LED	Team Room	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	561.6	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	C-OCC	2184	393.1	168.5	0.0	$20.55	$270.00	$35.00	13.1	11.4
250	Gymnasium	30	T 54 W F 3 (ELE) (T-5)	F43GHL	177	5.3	SW	3120	16,567.2	30	T 54 W F 3 (ELE) (T-5)	F43GHL	177	5.3	None	3120	16,567.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
	Total	**978**				**79.4**			**244702.1**	**978.0**				**79.4**			**201674.7**	**43027.5**	**0.0**	**5249.3**	**24570.0**	**3185.0**		
																	Demand Savings			0.0	$0			
																	kWh Savings			43,027	$5,249			
																	Total Savings				$5,249		**4.7**	**4.1**

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

	EXISTING CONDITIONS									RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
40LED	Room 101	15	T 32 R F 2 (ELE)	F42LL	60	0.9	SW	2600	2,340	15	T 38 R LED	RTLED38	38	0.6	C-OCC	2,080	1,186	1,154	0.3	$ 164.47	$ 3,813.75	$ 785	23.2	18.4
40LED	Room 102	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	2600	936	6	T 38 R LED	RTLED38	38	0.2	C-OCC	1,820	415	521	0.1	$ 73.02	$ 1,687.50	$ 335	23.1	18.5
40LED	Room 103	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	T 38 R LED	RTLED38	38	0.2	C-OCC	1,820	277	347	0.1	$ 48.68	$ 1,215.00	$ 235	25.0	20.1
40LED	Room 104	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	C-OCC	2,080	711	693	0.2	$ 98.68	$ 2,396.25	$ 485	24.3	19.4
40LED	Room 105	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	C-OCC	2,080	711	693	0.2	$ 98.68	$ 2,396.25	$ 485	24.3	19.4
40LED	Room 106	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	C-OCC	2,080	711	693	0.2	$ 98.68	$ 2,396.25	$ 485	24.3	19.4
40LED	Room 107	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	C-OCC	2,080	711	693	0.2	$ 98.68	$ 2,396.25	$ 485	24.3	19.4
40LED	Room 108	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	C-OCC	2,080	711	693	0.2	$ 98.68	$ 2,396.25	$ 485	24.3	19.4
40LED	Room 109	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	C-OCC	2,080	711	693	0.2	$ 98.68	$ 2,396.25	$ 485	24.3	19.4
40LED	Room 110	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	C-OCC	2,080	711	693	0.2	$ 98.68	$ 2,396.25	$ 485	24.3	19.4
40LED	Room 111	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	T 38 R LED	RTLED38	38	0.3	C-OCC	2,080	711	693	0.2	$ 98.68	$ 2,396.25	$ 485	24.3	19.4
40LED	Corridor	30	T 32 R F 2 (ELE)	F42LL	60	1.8	SW	6240	11,232	30	T 38 R LED	RTLED38	38	1.1	C-OCC	6,240	7,114	4,118	0.7	$ 549.72	$ 7,357.50	$ 1,535	13.4	10.6
40LED	Work Room	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	T 38 R LED	RTLED38	38	0.2	C-OCC	1,820	277	347	0.1	$ 48.68	$ 1,215.00	$ 235	25.0	20.1
198	Work Room	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.0	SW	2600	81	1	2T 17 R F 2 (ELE) REFLECTOR	F22LL	31	0.0	C-OCC	1,820	56	24	0.0	$ 2.95	$ 270.00	$ 35	91.5	79.7
40LED	Exam Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	C-OCC	1,820	138	174	0.0	$ 24.34	$ 742.50	$ 135	30.5	25.0
40LED	Nurse Room and Rest Area	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	2600	1,092	7	T 38 R LED	RTLED38	38	0.3	C-OCC	1,820	484	608	0.2	$ 85.19	$ 1,923.75	$ 385	22.6	18.1
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	C-OCC	1,820	138	174	0.0	$ 24.34	$ 742.50	$ 135	30.5	25.0
198LED	Waiting Room	22	2T 17 R F 2 (ELE)	F22LL	31	0.7	SW	2600	1,773	22	2T 25 R LED	2RTLED	25	0.6	C-OCC	1,820	1,001	772	0.1	$ 103.66	$ 4,725.00	$ 1,135	45.6	34.6
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	C-OCC	1,820	138	174	0.0	$ 24.34	$ 742.50	$ 135	30.5	25.0
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	C-OCC	1,820	138	174	0.0	$ 24.34	$ 742.50	$ 135	30.5	25.0
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	C-OCC	1,820	138	174	0.0	$ 24.34	$ 742.50	$ 135	30.5	25.0
40LED	VP Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	T 38 R LED	RTLED38	38	0.1	C-OCC	1,820	138	174	0.0	$ 24.34	$ 742.50	$ 135	30.5	25.0
198LED	Record Room	5	2T 17 R F 2 (ELE)	F22LL	31	0.2	SW	2600	403	5	2T 25 R LED	2RTLED	25	0.1	C-OCC	1,820	228	176	0.0	$ 23.56	$ 1,282.50	$ 285	54.4	42.3
198LED	General Office	16	2T 17 R F 2 (ELE)	F22LL	31	0.5	SW	2600	1,290	16	2T 25 R LED	2RTLED	25	0.4	C-OCC	1,820	728	562	0.1	$ 75.39	$ 3,510.00	$ 835	46.6	35.5
198LED	Conference Room	5	2T 17 R F 2 (ELE)	F22LL	31	0.2	SW	1560	242	5	2T 25 R LED	2RTLED	25	0.1	C-OCC	1,092	137	105	0.0	$ 15.00	$ 1,282.50	$ 285	85.5	66.5
198LED	Principle Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322	4	2T 25 R LED	2RTLED	25	0.1	C-OCC	1,820	182	140	0.0	$ 18.85	$ 1,080.00	$ 235	57.3	44.8
198LED	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322	4	2T 25 R LED	2RTLED	25	0.1	C-OCC	1,820	182	140	0.0	$ 18.85	$ 1,080.00	$ 235	57.3	44.8
198LED	Office	4	2T 17 R F 2 (ELE)	F22LL	31	0.1	SW	2600	322	4	2T 25 R LED	2RTLED	25	0.1	C-OCC	1,820	182	140	0.0	$ 18.85	$ 1,080.00	$ 235	57.3	44.8
24LED	Room 401	5	1B 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780	5	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,820	273	507	0.2	$ 72.60	$ 1,438.50	$ 210	19.8	16.9
24LED	Room 402	5	1B 32 P F 2 (ELE)	F42LL	60	0.3	SW	2600	780	5	4 ft LED Tube	200732x2	30	0.2	C-OCC	2,080	312	468	0.2	$ 67.84	$ 1,438.50	$ 210	21.2	18.1
24LED	Room 403	10	1B 32 P F 2 (ELE)	F42LL	60	0.6	SW	2600	1,560	10	4 ft LED Tube	200732x2	30	0.3	C-OCC	2,080	624	936	0.3	$ 135.68	$ 2,607.00	$ 385	19.2	16.4
24LED	Room 404	15	1B 32 P F 2 (ELE)	F42LL	60	0.9	SW	2600	2,340	15	4 ft LED Tube	200732x2	30	0.5	C-OCC	2,080	936	1,404	0.5	$ 203.52	$ 3,775.50	$ 560	18.6	15.8
24LED	Room 405	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	C-OCC	2,080	562	842	0.3	$ 122.11	$ 2,373.30	$ 350	19.4	16.6
24LED	Room 406	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	C-OCC	2,080	562	842	0.3	$ 122.11	$ 2,373.30	$ 350	19.4	16.6
24LED	Room 407	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	C-OCC	2,080	562	842	0.3	$ 122.11	$ 2,373.30	$ 350	19.4	16.6
24LED	Room 408	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	C-OCC	2,080	562	842	0.3	$ 122.11	$ 2,373.30	$ 350	19.4	16.6
24LED	Room 409	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	C-OCC	2,080	562	842	0.3	$ 122.11	$ 2,373.30	$ 350	19.4	16.6
24LED	Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	4 ft LED Tube	200732x2	30	0.1	C-OCC	1,820	109	203	0.1	$ 29.04	$ 737.40	$ 105	25.4	21.8
24LED	Corridor	8	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	2,995	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	6,240	1,498	1,498	0.2	$ 199.90	$ 2,139.60	$ 315	10.7	9.1
212	Library	50	T 32 R F 4 (ELE) (TWO SWITCH)	F44ILL	112	5.6	SW	3120	17,472	50	T 32 R F 4 (ELE) (TWO SWITCH)	F44ILL	112	5.6	C-OCC	-	-	17,472	0.0	$ 2,131.58	$ 270.00	$ 35	0.1	0.1
35LED	Room 200	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212	18	T 59 R LED	RTLED38	38	0.7	C-OCC	2,080	1,423	2,789	0.9	$ 407.34	$ 4,522.50	$ 35	11.1	11.0
35LED	Room 201	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808	12	T 59 R LED	RTLED38	38	0.5	C-OCC	2,080	948	1,860	0.6	$ 271.56	$ 3,105.00	$ 35	11.4	11.3
35LED	Room 202	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212	18	T 59 R LED	RTLED38	38	0.7	C-OCC	2,080	1,423	2,789	0.9	$ 407.34	$ 4,522.50	$ 35	11.1	11.0
35LED	Room 203	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808	12	T 59 R LED	RTLED38	38	0.5	C-OCC	2,080	948	1,860	0.6	$ 271.56	$ 3,105.00	$ 35	11.4	11.3
35LED	Room 204	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	C-OCC	2,080	474	930	0.3	$ 135.78	$ 1,687.50	$ 35	12.4	12.2
35LED	Room 205 L	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	C-OCC	2,080	474	930	0.3	$ 135.78	$ 1,687.50	$ 35	12.4	12.2
35LED	Room 205 C	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	C-OCC	2,080	474	930	0.3	$ 135.78	$ 1,687.50	$ 35	12.4	12.2
35LED	Room 206	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	C-OCC	2,080	474	930	0.3	$ 135.78	$ 1,687.50	$ 35	12.4	12.2
35LED	Room 207	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510	15	T 59 R LED	RTLED38	38	0.6	C-OCC	2,080	1,186	2,324	0.8	$ 339.45	$ 3,813.75	$ 35	11.2	11.1
35LED	Room 208	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808	12	T 59 R LED	RTLED38	38	0.5	C-OCC	2,080	948	1,860	0.6	$ 271.56	$ 3,105.00	$ 35	11.4	11.3
35LED	Room 209	10	T 32 R F 3 (ELE)	F43ILL/2	90	0.9	SW	2600	2,340	10	T 59 R LED	RTLED38	38	0.4	C-OCC	2,080	790	1,550	0.5	$ 226.30	$ 2,632.50	$ 35	11.6	11.5
35LED	Room 211	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510	15	T 59 R LED	RTLED38	38	0.6	C-OCC	2,080	1,186	2,324	0.8	$ 339.45	$ 3,813.75	$ 35	11.2	11.1
35LED	Room 212	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	2600	3,510	15	T 59 R LED	RTLED38	38	0.6	C-OCC	2,080	1,186	2,324	0.8	$ 339.45	$ 3,813.75	$ 35	11.2	11.1
24LED	Room 212 Storage	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	2600	1,404	9	4 ft LED Tube	200732x2	30	0.3	C-OCC	2,080	562	842	0.3	$ 122.11	$ 2,373.30	$ 350	19.4	16.6
35LED	Room 213	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2600	2,808	12	T 59 R LED	RTLED38	38	0.5	C-OCC	2,080	948	1,860	0.6	$ 271.56	$ 3,105.00	$ 35	11.4	11.3
35LED	Room 215	24	T 32 R F 3 (ELE)	F43ILL/2	90	2.2	SW	2600	5,616	24	T 59 R LED	RTLED38	38	0.9	C-OCC	2,080	1,897	3,719	1.2	$ 543.11	$ 5,940.00	$ 35	10.9	10.9
35LED	Room 217	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2600	4,212	18	T 59 R LED	RTLED38	38	0.7	C-OCC	2,080	1,423	2,789	0.9	$ 407.34	$ 4,522.50	$ 35	11.1	11.0
24LED	Corridor	9	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	3,370	9	4 ft LED Tube	200732x2	30	0.3	C-OCC	6,240	1,685	1,685	0.3	$ 224.89	$ 2,373.30	$ 350	10.6	9.0
18LED	Stage	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	3120	2,097	6	T 74 R LED	RTLED50	50	0.3	None	3,120	936	1,161	0.4	$ 168.24	$ 1,417.50	$ -	8.4	8.4
217	Auditorium	23	2B 17 C F 2 (ELE)	F22ILL	33	0.8	SW	3120	2,368	23	2B 17 C F 2 (ELE)	F22ILL	33	0.8	None	3,120	2,368	-	0.0	$ -	$ -	$ -		
24LED	Lobby	8	1B 32 P F 2 (ELE)	F42LL	60	0.5	SW	6240	2,995	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	6,240	1,498	1,498	0.2	$ 199.90	$ 2,139.60	$ 315	10.7	9.1
196	Weight Room	12	W 32 C F 4 (ELE)	F44ILL	112	1.3	SW	3120	4,193	12	W 28 C F 4	F44SSILL	96	1.2	None	3,120	3,594	599	0.2	$ 86.84	$ 1,701.00	$ 120	19.6	18.2
169LED	Dance Studio	24	WP 250 MH	MH250/1	295	7.1	SW	3120	22,090	24	FXLED78	FXLED78/1	78	1.9	None	3,120	5,841	16,249	5.2	$ 2,355.41	$ 20,260.69	$ 4,200	8.6	6.8
199	Weight Room Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	100	2	W 28 C F 1	F41SSILL	26	0.1	C-OCC	1,092	57	43	0.0	$ 6.11	$ 499.50	$ 55	81.7	72.7
24LED	Therapy Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	749	4	4 ft LED Tube	200732x2	30	0.1	None	3,120	374	374	0.1	$ 54.27	$ 934.80	$ 140	17.2	14.6
18LED	Cafeteria	54	T 32 R F 4 (ELE)	F44ILL	112	6.0	SW	2600	15,725	54	T 74 R LED	RTLED50	50	2.7	None	2,600	7,020	8,705	3.3	$ 1,301.80	$ 12,757.50	$ -	9.8	9.8
35LED	Corridor	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	6240	3,370	6	T 59 R LED	RTLED38	38	0.2	None	6,240	1,423	1,947	0.3	$ 259.87	$ 1,417.50	$ -	5.5	5.5
18LED	Kitchen	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2600	2,621	9	T 74 R LED	RTLED50	50	0.5	None	2,600	1,170	1,451	0.6	$ 216.97	$ 2,126.25	$ -	9.8	9.8
18LED	Food Dry	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	2600	874	3	T 74 R LED	RTLED50	50	0.2	None	2,600	390	484	0.2	$ 72.32	$ 708.75	$ -	9.8	9.8
18LED	Corridor	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	6240	4,193	6	T 74 R LED	RTLED50	50	0.3	None	6,240	1,872	2,321	0.4	$ 309.84	$ 1,417.50	$ -	4.6	4.6
24LED	Boiler Room	17	1B 32 P F 2 (ELE)	F42LL	60	1.0	SW	6240	6,365	17	4 ft LED Tube	200732x2	30	0.5	None	6,240	3,182	3,182	0.5	$ 424.78	$ 3,972.90	$ 595	9.4	8.0
24LED	Boys Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	749	4	4 ft LED Tube	200732x2	30	0.1	C-OCC	2,184	262	487	0.1	$ 67.98	$ 1,204.80	$ 175	17.7	15.1
24LED	Girls Room	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	749	4	4 ft LED Tube	200732x2	30	0.1	C-OCC	2,184	262	487	0.1	$ 67.98	$ 1,204.80	$ 175	17.7	15.1
24LED	Corridor	27	1B 32 P F 2 (ELE)	F42LL	60	1.6	SW	6240	10,109	27	4 ft LED Tube	200732x2	30	0.8	C-OCC	6,240	5,054	5,054	0.8	$ 674.66	$ 6,579.90	$ 980	9.8	8.3
35LED	Room 301	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106	9	T 59 R LED	RTLED38	38	0.3	C-OCC	2,080	711	1,395	0.5	$ 203.67	$ 2,396.25	$ 35	11.8	11.6
18LED	Room 302	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	2600	1,747	6	T 74 R LED	RTLED50	50	0.3	C-OCC	2,080	624	1,123	0.4	$ 163.68	$ 1,687.50	$ 35	10.3	10.1
202	Room 303	6	2T 17 R F 4 (ELE)	F22ILL	33	0.2	SW	2600	515	6	2T 17 R F 4 (ELE)	F22ILL	33	0.2	C-OCC	2,080	412	103	0.0	$ 12.56	$ 270.00	$ 35	21.5	18.7
35LED	SCI	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	C-OCC	2,080	474	930	0.3	$ 135.78	$ 1,687.50	$ 35	12.4	12.2
35LED	Room 603	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	2600	936	4	T 59 R LED	RTLED38	38	0.2	C-OCC	2,080	316	620	0.2	$ 90.52	$ 1,215.00	$ 35	13.4	13.0
35LED	Room 602	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.3	SW	2600	702	3	T 59 R LED	RTLED38	38	0.1	C-OCC	2,080	237	465	0.2	$ 67.89	$ 978.75	$ 35	14.4	13.9
35LED	Room 309	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	2600	1,404	6	T 59 R LED	RTLED38	38	0.2	C-OCC	2,080	474	930	0.3	$ 135.78	$ 1,687.50	$ 35	12.4	12.2
35LED	Room 301	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106	9	T 59 R LED	RTLED38	38	0.3	C-OCC	2,080	711	1,395	0.5	$ 203.67	$ 2,396.25	$ 35	11.8	11.6
40LED	Room 311	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	T 38 R LED	RTLED38	38	0.2	C-OCC	2,080	316	308	0.1	$ 43.86	$ 1,215.00	$ 235	27.7	22.3
40LED	Room 311 Storage	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1560	374	4	T 38 R LED	RTLED38	38	0.2	C-OCC	1,092	166	208	0.1	$ 31.73	$ 1,215.00	$ 235	38.3	30.9
35LED	Room 315	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106	9	T 59 R LED	RTLED38	38	0.3	C-OCC	2,080	711	1,395	0.5	$ 203.67	$ 2,396.25	$ 35	11.8	11.6
35LED	Room 313	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	2600	2,106	9	T 59 R LED	RTLED38	38	0.3	C-OCC	2,080	711	1,395	0.5	$ 203.67	$ 2,396.25	$ 35	11.8	11.6
199	Boys Locker Room	28	W 32 C F 1 (ELE)	F41LL	32	0.9	SW	3120	2,796	28	W 28 C F 1	F41SSILL	26	0.7	C-OCC	2,184	1,590	1,206	0.2	$ 159.11	$ 3,483.00	$ 315	21.9	19.9
24LED	PE Office	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	4 ft LED Tube	200732x2	30	0.1	C-OCC	1,820	218	406	0.1	$ 58.08	$ 1,204.80	$ 175	20.7	17.7
24LED	Coach Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	4 ft LED Tube	200732x2	30	0.1	C-OCC	1,820	109	203	0.1	$ 29.04	$ 737.40	$ 105	25.4	21.8
199	Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	100	2	W 28 C F 1	F41SSILL	26	0.1	C-OCC	1,092	57	43	0.0	$ 6.11	$ 499.50	$ 55	81.7	72.7
24LED	Shower	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	562	3	4 ft LED Tube	200732x2	30	0.1	C-OCC	2,184	197	365	0.1	$ 50.98	$ 971.10	$ 140	19.0	16.3
206	Shower	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	SW	3120	646	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	C-OCC	2,184	452	194	0.0	$ 23.64	$ 270.00	$ 35	11.4	9.9
24LED	Restroom	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	3120	374	2	4 ft LED Tube	200732x2	30	0.1	C-OCC	2,184	131	243	0.1	$ 33.99	$ 737.40	$ 105	21.7	18.6
24LED	Team Room	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	562	3	4 ft LED Tube	200732x2	30	0.1	C-OCC	2,184	197	365	0.1	$ 50.98	$ 971.10	$ 140	19.0	16.3
199	Girls Locker Room	28	W 32 C F 1 (ELE)	F41LL	32	0.9	SW	3120	2,796	28	W 28 C F 1	F41SSILL	26	0.7	C-OCC	2,184	1,590	1,206	0.2	$ 159.11	$ 3,483.00	$ 315	21.9	19.9
24LED	PE Office	4	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	2600	624	4	4 ft LED Tube	200732x2	30	0.1	C-OCC	1,820	218	406	0.1	$ 58.08	$ 1,204.80	$ 175	20.7	17.7
24LED	Coach Office	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	2600	312	2	4 ft LED Tube	200732x2	30	0.1	C-OCC	1,820	109	203	0.1	$ 29.04	$ 737.40	$ 105	25.4	21.8
199	Storage	2	W 32 C F 1 (ELE)	F41LL	32	0.1	SW	1560	100	2	W 28 C F 1	F41SSILL	26	0.1	C-OCC	1,092	57	43	0.0	$ 6.11	$ 499.50	$ 55	81.7	72.7
24LED	Shower	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	562	3	4 ft LED Tube	200732x2	30	0.1	C-OCC	2,184	197	365	0.1	$ 50.98	$ 971.10	$ 140	19.0	16.3
206	Shower	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	SW	3120	646	1	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	0.2	C-OCC	2,184	452	194	0.0	$ 23.64	$ 270.00	$ 35	11.4	9.9
24LED	Restroom	2	1B 32 P F 2 (ELE)	F42LL	60	0.1	SW	3120	374	2	4 ft LED Tube	200732x2	30	0.1	C-OCC	2,184	131	243	0.1	$ 33.99	$ 737.40	$ 105	21.7	18.6
24LED	Team Room	3	1B 32 P F 2 (ELE)	F42LL	60	0.2	SW	3120	562	3	4 ft LED Tube	200732x2	30	0.1	C-OCC	2,184	197	365	0.1	$ 50.98	$ 971.10	$ 140	19.0	16.3
250	Gymnasium	30	T 54 W F 3 (ELE) (T-5)	F43GHL	177	5.3	SW	3120	16,567	30	T 54 W F 3 (ELE) (T-5)	F43GHL	177	5.3	None	3,120	16,567	-	0.0	$ -	$ -	$ -		
S	**Total**	**978**				**79.4**			**244,702**	**978**				**44.8**			**107,614**		**34.6**	**19,206**	**232,551**	**$26,025**		
S																	**Demand Savings**			**34.6**	**$2,482**			
S																	**kWh Savings**			**137,088**	**$16,725**			
S																	**Total Savings**				**$19,206**		**12.1**	**10.8**

APPENDIX D

New Jersey Board of Public Utilities Incentives

i. **Smart Start**

ii. **Direct Install**

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

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

I. SMART START

NJ SmartStart Buildings

Program Overview

With New Jersey SmartStart Buildings ...

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

Special Notice

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

Visit the Sandy web page for details and important links.

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

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

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

Getting Started

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

PAST PROGRAMS

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

Support for Custom Energy-Efficiency Measures

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

Incentives for Qualifying Equipment and Projects

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

Find out more about equipment incentives

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

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COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

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NJ SMARTSTART BUILDINGS

EQUIPMENT INCENTIVES

FOOD SERVICE EQUIPMENT

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PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

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Equipment Incentives

Special Notice

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

Visit the Sandy web page for details and important links.

More reasons for a smart start on your next project!

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

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

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

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

Electric Chillers

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

Gas Cooling

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

PAST PROGRAMS

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

Electric Unitary HVAC

Unitary AC and split systems ($73 - $92 per ton)
Air-to-air heat pumps ($73 - $92 per ton)
Water-source heat pumps ($81 per ton)
Packaged terminal AC & HP ($65 per ton)
Central DX AC Systems ($40 - $72 per ton)
Dual Enthalpy Economizer Controls ($250)
Occupancy Controlled Thermostats ($75 each)
A/C Economizing Controls ($85 - $170 each)

Ground Source Heat Pumps

Closed Loop ($450-750 per ton)

Gas Heating

Gas-fired boilers < 300 MBH ($300 per unit)
Gas-fired boilers ≥ 300 MBH - 1500 MBH ($1.75 per MBH)
Gas-fired boilers ≥ 1500 MBH - ≤ 4000 MBH ($1.00 per MBH)
Gas-fired boilers > 4000 MBH (Calculated through Custom Measur
Gas furnaces ($300-$400 per unit)
Gas infrared heaters - indoor only ($300 - $500 per unit)
Boiler economizing controls ($1,200 - $2,700 per unit)

Variable Frequency Drives

Variable air volume ($65 - $155 per hp)
Chilled-water pumps ($60 per hp)
Compressors ($5,250 to $12,500 per drive)

Natural Gas Water Heating

Gas water heaters ≤ 50 gallons ($50 per unit)
Gas-fired water heaters > 50 gallons ($1.00 - $2.00 per MBH)
Tankless water heaters replacing a free standing water heater > 82 energy factor ($300 per heater)
Gas-fired booster water heaters ($17 - $35 per MBH)

Premium Motors

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

Refrigerator/Freezer Case Premium Efficiency Motors (ECM)

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

Prescriptive Lighting

New Linear Fluorescent

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

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

Lighting Controls

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

Refrigeration

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

Food Service Equipment

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

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

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

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

Other Equipment Incentives*

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

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

II. DIRECT INSTALL

Direct Install

NEW JERSEY'S CLEAN ENERGY PROGRAM
DIRECT Install

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

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

ELIGIBILITY

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

SYSTEMS & EQUIPMENT ADDRESSED BY THE PROGRAM

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

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

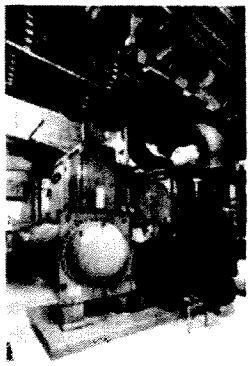
III. PAY FOR PERFORMANCE (P4P)

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

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



Eligibility

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

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

ENERGY STAR Portfolio Manager

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

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

Incentives

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

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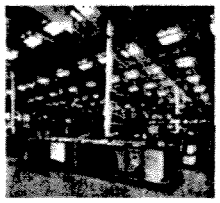
Pay for Performance incentives are awarded upon the satisfactory completion of three p milestones:

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



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

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

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

Steps to Participation

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

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

BPU New Jersey Board of Public Utilities

PAY FOR PERFORMANCE APPLICATION FORM

July 1, 2013 - June 30, 2014

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

Instructions

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

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

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

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

Partner Information

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

Project Information

Project Name

Building Address	City	State	Zip

Utility Account Number(s): Electric Gas

* Note: Please use the back of this page for additional utility accounts if quantity exceeds space allotment.

Annual Peak kW Demand	Building Type	Number of Buildings
Size of Building(s) (gross sq/ft)	Direct, Master or Sub Metered	

Funding

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

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

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

Additional Project information

Additional Utility Account(s)	
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number

Additional Comments:

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

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

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

Visit our website: NJCleanEnergy.com/P4P

*Incentives/Requirements subject to change.

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

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

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

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

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

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

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

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

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

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

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

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

Program Manager – TRC Energy Services.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

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COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

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Energy Savings Improvement Program

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

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

Local Government
School Districts (K-12)

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

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings
Procedures for Implementation

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

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

FIRST STEP – ENERGY AUDIT

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

ENERGY REDUCTION PLANS

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

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

ESIP PROGRAM

Final version 42413

BPU RULES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX E

Photovoltaic Analysis

Arthur P Schalick HS

Preliminary Screening
Solar PV

Cost of Electricity	$0.146	/kWh
Electricity Usage	1,492,963	kWh/yr
System Unit Cost	$4,000.000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$985,600	**246.4**	**399,699**	**0**	**$58,356**	**0**	**$58,356**	**$0**	**$69,947**	**16.9**	**7.7**

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

Area Output*

m2
0 ft2

Perimeter Output*

m
0 ft

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

Approximate System Size:

11	watt/ft2	
0	DC watts	
246	kW	Enter into PV Watts

PV Watts Inputs***

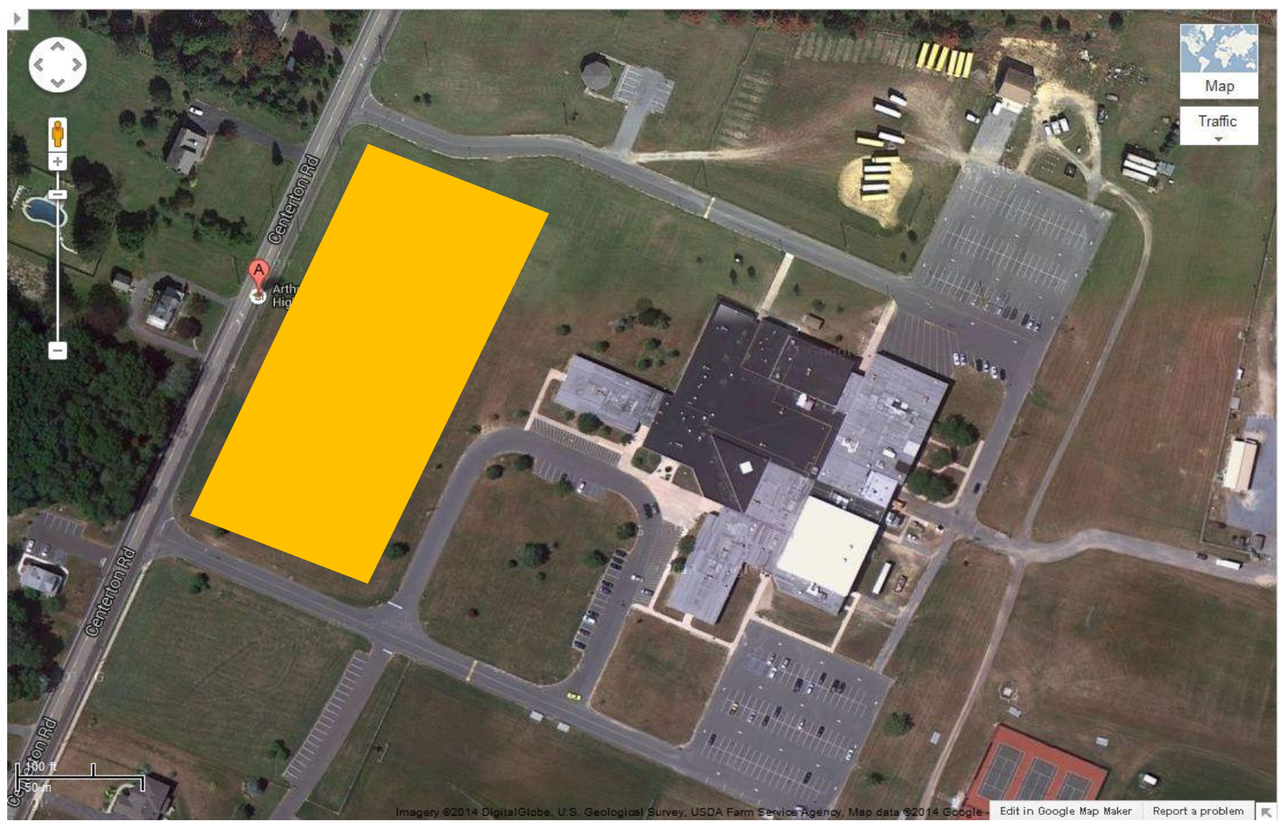
Array Tilt Angle	40	
Array Azimuth	170	Enter into PV Watts (default)
Zip Code	8318	Enter into PV Watts
DC/AC Derate Factor	0.77	Enter info PV Watts

PV Watts Output

399,699 annual kWh calculated in PV Watts program

% Offset Calc

Usage	1,492,963	(from utilities)
PV Generation	399,699	(generated using PV Watts)
% offset	27%	



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

** http://www.flettexchange.com

*** http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html

AC Energy & Cost Savings

Cautions for Interpreting the Results

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

Station Identification	
City:	Atlantic_City
State:	New_Jersey
Latitude:	39.45° N
Longitude:	74.57° W
Elevation:	20 m
PV System Specifications	
DC Rating:	320.0 kW
DC to AC Derate Factor:	0.770
AC Rating:	246.4 kW
Array Type:	Fixed Tilt
Array Tilt:	40.0°
Array Azimuth:	170.0°
Energy Specifications	
Cost of Electricity:	11.2 ¢/kWh

Results

Month	Solar Radiation (kWh/m ^{2}/day)	AC Energy (kWh)	Energy Value ($)
1	3.61	28528	3195.14
2	4.19	29744	3331.33
3	4.76	35895	4020.24
4	5.20	36954	4138.85
5	5.39	38668	4330.82
6	5.45	36238	4058.66
7	5.52	37406	4189.47
8	5.39	36963	4139.86
9	5.21	35430	3968.16
10	4.60	32981	3693.87
11	3.59	26366	2952.99
12	3.17	24526	2746.91
Year	4.68	399699	44766.29

Output Hourly Performance Data

Output Results as Text

About the Hourly Performance Data

Saving Text from a Browser

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

Please send questions and comments regarding PVWATTS to Webmaster

Disclaimer and copyright notice

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


RReDC

APPENDIX F

Photos

ECM-1 Replace the Boiler with Condensing Boilers

Existing Boilers

ECM-2 Replace Cooling Towers with a VFD Cooling Tower

Existing Cooling Towers

ECM-3 Convert Water Source Heat Pump Loop to Ground Source Loop

Existing Water Loop Pumps

ECM-4 Install Demand Control Ventilation on RTUs

Existing RTUs for Gym

ECM-5 Replace one Electric DHW Heater with a Condensing Gas Fired Heater

Existing Electric Water Heater

ECM-6 Kitchen Hood Control

Existing Kitchen Hood

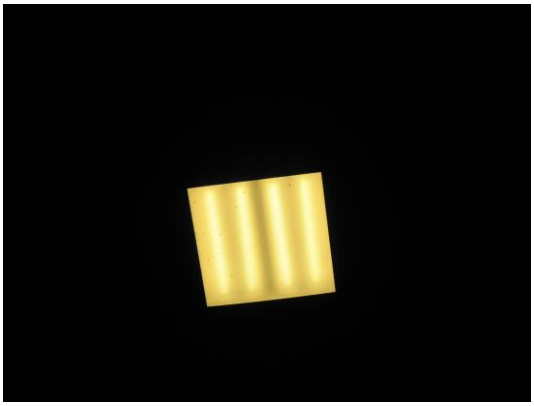
ECM-7 Walk-in Cooler & Freezer EC Motor Retrofits

Existing Walk in Freezer

ECM-8 Install Vending Misers

Existing Vending Machines

ECM-L1 Lighting Replacement / Upgrades



Existing T8 Lamps

ECM-L2 Install Lighting Controls (Occupancy Sensors)

No Pictures Available

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

See ECM L-1 and L-2

APPENDIX G

EPA Benchmarking Report

ENERGY STAR® Statement of Energy Performance

35

ENERGY STAR® Score[1]

Arthur P. Schalick High School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 112,000
Built: 1976

For Year Ending: April 30, 2014
Date Generated: May 29, 2014

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Arthur P. Schalick High School 718 Centerton Road Pittsgrove, New Jersey 08318	Pittsgrove Township Schools 1083 Almond Road Pittsgrove, NJ 08318 (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4058358

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
80.7 kBtu/ft²

Source EUI
179.8 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	5,093,990 (56%)
Natural Gas (kBtu)	3,942,400 (44%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	70.8
National Median Source EUI (kBtu/ft²)	157.7
% Diff from National Median Source EUI	14%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	854

Signature & Stamp of Verifying Professional

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

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)