CARTERET BOARD OF EDUCATION

CARTERET MIDDLE SCHOOL

300 Carteret Avenue, Carteret, NJ 07008

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

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CHA PROJECT NO. 30201

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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 the Carteret Middle School 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
Carteret Middle School	300 Carteret Avenue, Carteret, NJ 07008	78,595	1961

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

Building Name	Electric Savings (kWh)	NG Savings (therms)	Total Savings ($)	Payback (years)
Carteret Middle School	206,823	2,016	34,800	15.2

The annual savings for each individual measure 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
1	Hot Water Coils for Airedale	259,200	4,216	61.5	0	61.5	N
2	Install VFDs on HW Pumps	11,826	500	23.6	0	23.6	Y
3	Retro-Commission DDC Controls	34,870	4,025	8.7	0	8.7	Y
4	Replace DHW Heater with Condensing	17,696	1,316	13.4	600	13.0	Y
5	Replace Old RTUs with High Efficiency RTUs	106,900	4,327	24.7	3,600	23.9	Y
6	Window A/C Unit Controllers	3,500	4,416	0.8	0	0.8	Y
L1**	Lighting Replacements	331,523	17,915	18.5	20,955	17.3	N
L2**	Lighting Controls	22,140	3,848	5.8	1,640	5.3	N
L3	Lighting Replacements with Controls	353,663	20,216	17.5	22,595	16.4	Y
	Total**	**787,655**	**39,016**	**20.2**	**26,795**	**19.5**	
	Total (Recommended)	**528,455**	**34,800**	**15.2**	**26,795**	**14.4**	

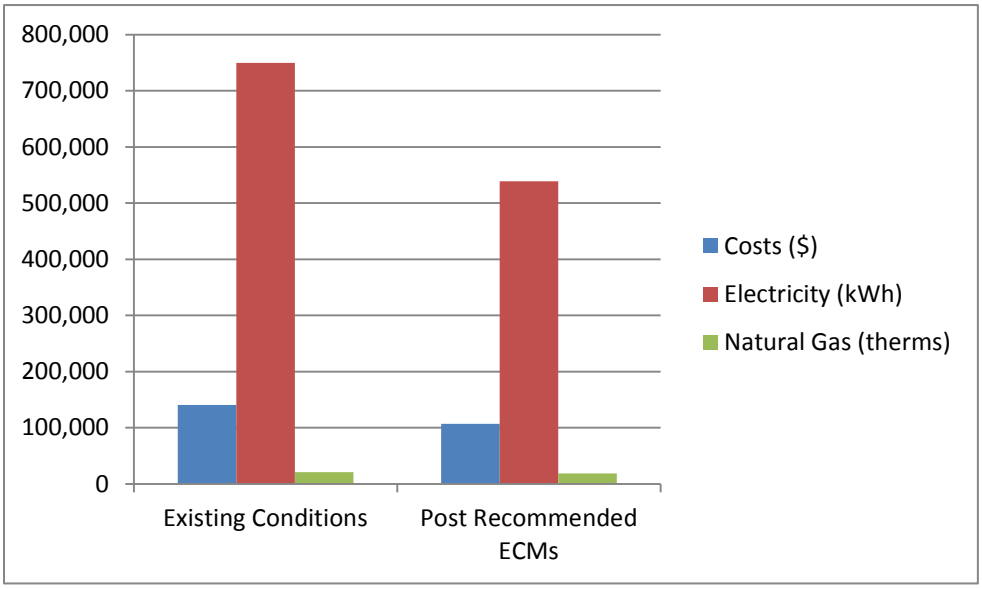
* Incentive shown is per the New Jersey SmartStart Program.
** These ECMs are not included in the Total, as they are alternate measures not recommended.

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

Photovoltaic (PV) Rooftop Solar Power Generation – 170 kW System

If the Carteret Board of Education implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	140,853	106,053	25%
Electricity (kWh)	749,800	542,977	28%
Natural Gas (therms)	20,817	18,801	10%
Site EUI (kbtu/SF/Yr)	59.0	47.5	



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: Carteret Middle School
Address: 300 Carteret Avenue, Carteret, NJ 07008
Gross Floor Area: 78,595 Square Feet
Number of Floors: 2 and a basement
Year Built: 1961, addition in 1996

Description of Spaces: Classrooms, offices, cafeteria, auditorium, stage, gymnasium, computer lab, media center, storage rooms, toilet rooms and mechanical rooms.
Description of Occupancy: The school serves approximately 900 students in 6th, 7th and 8th grades. There are approximately100 school faculty and staff members.
Number of Computers: The school has approximately 175 desktop and laptop computers.

Building Usage: Hours of operation are 7:40 AM to 2:30 PM Monday through Friday, with various after-school activities. Custodial staff are on site in three shifts, from 6:00 AM to 3:00 PM, and 2:30 PM to 10:00 PM, 10 months per year. The middle school is also utilized during summer months 8:00 AM to noon Monday through Friday.

Building Envelope

Construction Materials: The Carteret Middle School is constructed from steel framing with concrete masonry unit and brick exterior walls, insulation unknown but assumed minimal. Interior walls a mix of sheetrock and plaster & lathe. Interior and exterior walls are in fair to good condition.

Roof: The roof is flat and surfaced with a rolled asphalt sheeting over rigid insulation and metal decking, and appears to be in good condition. No roof associated ECMs are considered.
Windows Double hung double pane windows with aluminum frames. Windows are in good condition and no ECMs associated with window replacement were evaluated.
Exterior Doors: Exterior doors throughout the building are aluminum framed with full length safety glass, and solid metal doors for employee use only. There is a vestibule at each public entrance. Sweeps and seals are in good condition. No additional ECMs are evaluated for exterior doors.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: Two gas fired Burnham hot water boilers with Powerflame burners, and capacity of 2325 MBH, provide the majority of heat to the building. The boilers were installed in 2008 and have a combustion efficiency of 83.9%. Only one boiler at a time is required to keep the building heated and for this reason they are operated on an alternating basis. For the most part these boilers supply heating hot water to air handling units (gymnasium & stage), unit ventilators and cabinet heaters in the original 1961 section of the school. This is accomplished via a primary pumping system utilizing 7.5 HP base mounted pumps without VFDs. The newer 1996 portion of the school makes use of electric Airedale heat pumps in classrooms, and gas fired rooftop equipment for the cafeteria and offices. The Airedales are equipped with back-up electric resistance heating elements. A third 2008 Burnham boiler with 1,023 MBH capacity heats the northeast classroom wing and portions of the west wing that were refurbished in 1996. These are outfitted with hot water unit ventilators, fin radiation, and cabinet heaters. A pair of base mounted 1.5 HP pumps circulates the hot water for these areas.

Additionally the building has several small capacity electric resistance unit heaters in various locations.

Cooling: The building is entirely air conditioned except for the gymnasium. Classrooms with hydronic unit ventilators are outfitted with 2.5 ton Friedrich window A/C units. Classrooms in the 1996 addition utilize the Airedale heat pumps for cooling. The cafeteria is cooled by two (2) Lennox DX rooftop units. Miscellaneous offices make use of Carrier DX split systems, with the condensing units installed on the roof. Altogether the building utilizes approximately 175-200 tons of cooling.

Ventilation: Ventilation air is provided to the interior of the building by classroom unit ventilators, gymnasium air handling units (ducted to the exterior), and operable windows. In general, building ventilation is adequate and no associated ECMs are included.

Exhaust: The facility utilizes exhaust fans of various sizes located on the roof to exhaust air from restrooms and storage areas, and provide general pressure relief.

Controls Systems

The building has a 3-year old Johnson digital control system that controls the boilers, pumps, air handling units, Airedale units, and unit ventilators. There is a computer gateway consisting of one laptop computer that is shared between the Middle School, Columbus, and Private Nicholas Minue schools. A few designated operators are allowed to see unit motor operation and space temperatures on this laptop, but are not provided the capability to change operation, alter temperature set-points, or even perform unit scheduling. Each room is outfitted with a wall-mounted temperature sensor that appears to provide individual unit control, but in reality does nothing. The boilers are activated in October and shut down at the end of April. Temperatures in the building are maintained between 70-72°F in the heating season and 73-75°F in the cooling season during both occupied and unoccupied times. An ECM is included to retro-commission the controls and provide greater building maintenance access into the system.

Domestic Hot Water Systems

Domestic hot water is provided by two 74 gallon 2006 A.O. Smith tank type gas fired water heaters of 75,000 BTUH capacity. Domestic hot water is primarily used for hand-washing and cleaning. The kitchen has its own electric DHW heater, with an estimated capacity of about 40 gallons. Additionally there are several EEMAX electric instantaneous on-demand water heaters installed under the sinks in art and science rooms. An ECM considering replacing the standard gas fired DHW heaters with higher efficiency condensing units is included.

Kitchen Equipment

The building has a small kitchen which includes a reach-in cooler and a triple sink for manual dishwashing, but food that is served is brought in from an outside vendor. There is also a break room with residential microwaves, refrigerators and other electrical appliances. No ECMs were included for kitchen equipment.

Plug Load

The Carteret Middle School has computers, copiers, residential appliances (microwave, refrigerator), printers, and portable heaters which contribute to the plug load in the building. By implementing other ECMs, plug load from the portable heaters may be reduced.

Plumbing Systems

Most of the building's original 1961 plumbing fixtures have been upgraded to lower flow fixtures, with 1.0 GPF for urinals, 1.8 GPF for water closets, and 2.2 GPM for metering type spring-loaded lavatory faucets. No plumbing fixture ECMs have been included.

Lighting Systems

Interior lighting is primarily T-8 32 watt four foot fluorescent lamps mounted in a variety of different fixtures. Gymnasium lighting is 4' high output T-5s with four lamps per fixture.

Recessed CFL lamps are used in vestibules and entranceways. All light fixtures are switched. Exterior building lighting consists of 150 watt metal halide wall-packs, 80 watt induction lamps, and 400 watt metal halide decorative sconces.

Three lighting ECMs have been included which include adding occupancy sensors to the existing lighting, replacement of the T-8 lighting with LED lighting and a third ECM that evaluates the effect of occupancy sensors used with the LED lighting upgrades.

3.0 UTILITIES

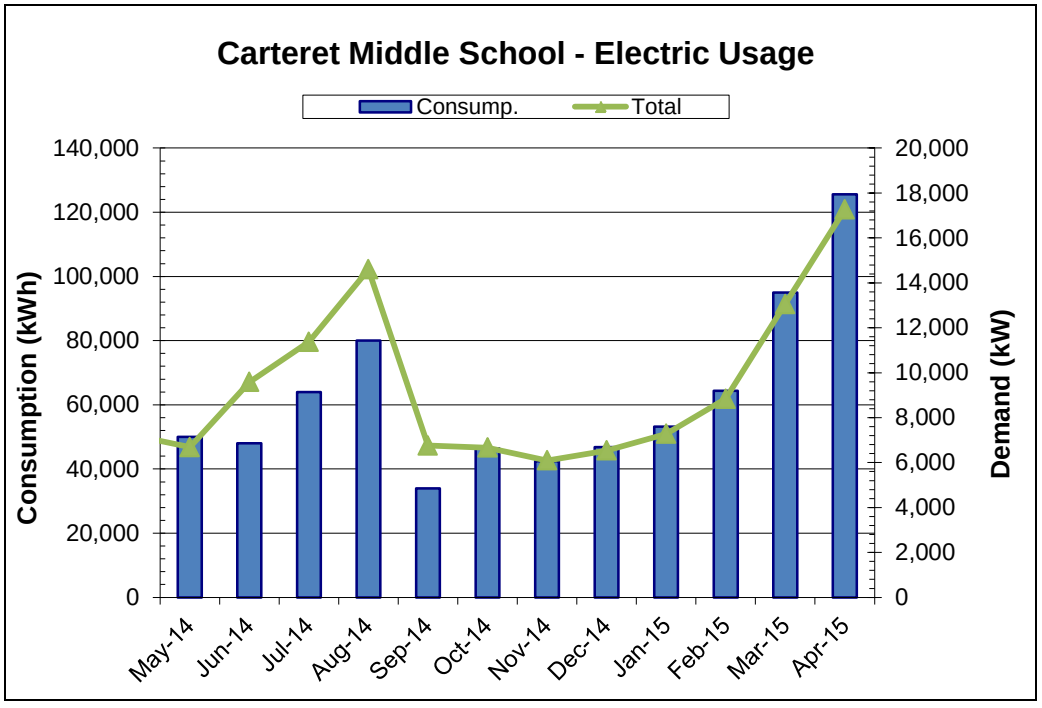
Utilities used by the building are delivered and supplied by the following utility companies:

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

For the 12-month period ending in April 2015, the utilities usages and costs for the building were as follows:

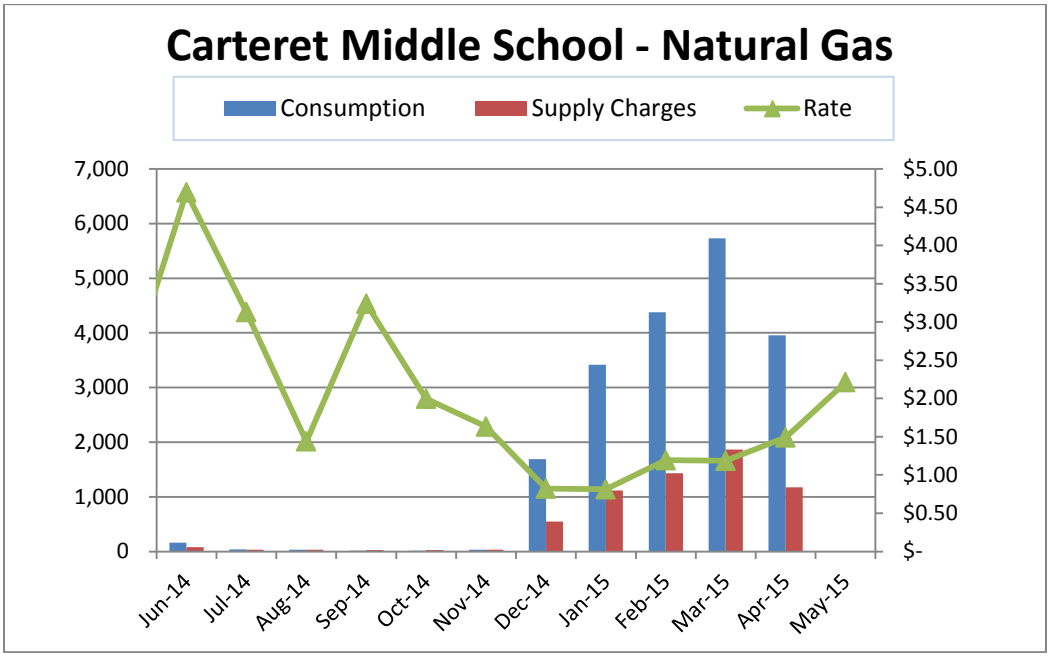
Electric		
Annual Consumption	749,800	kWh/yr.
Annual Cost	114,725	$
Blended Unit Rate	0.153	$/kWh
Supply Rate	0.127	$/kWh
Demand Rate	8.04	$/kW
Peak Demand	252.0	kW
Natural Gas		
Annual Usage	20,817	Therms/yr.
Annual Cost	26,128	$
Rate	1.255	$/therm

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 electrical usage for this building is fairly constant, with increased usage in the summer months for air conditioning. Summer peaks occur during the maximum

cooling season. The peaks during winter months which could be caused by electric heaters.



The natural gas usage is mostly driven by space heating in the winter months with a tail-off of usage during the summer months. The building does not have major kitchen use and at least half of domestic hot water is generated by electric water heaters.

See Appendix A for utility analysis.

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

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	Building Average Rate	NJ Average Rate	
Electricity	$/kWh	$0.153	$0.13	Y
Natural Gas	$/Therm	$1.255	$0.96	Y

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

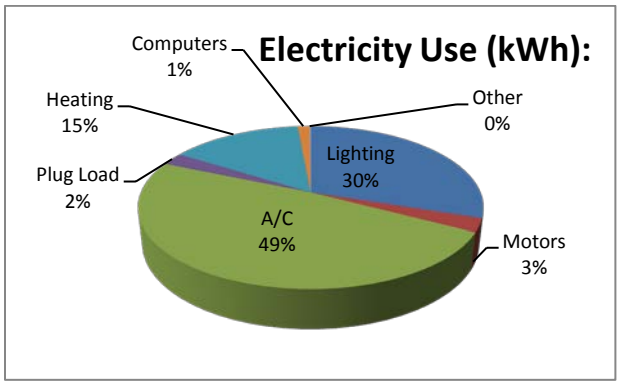
Additional information on selecting a third party energy supplier is available here:

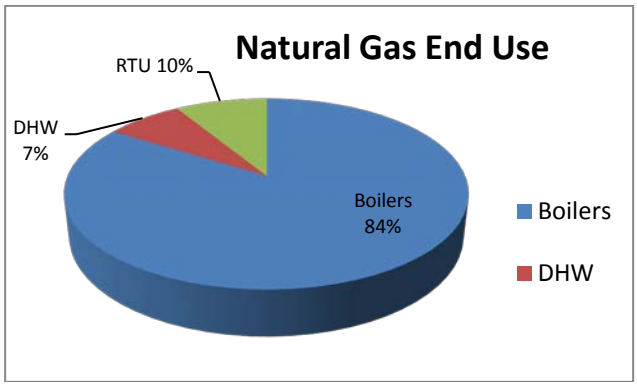
http://www.state.nj.us/bpu/commercial/shopping.html.

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.

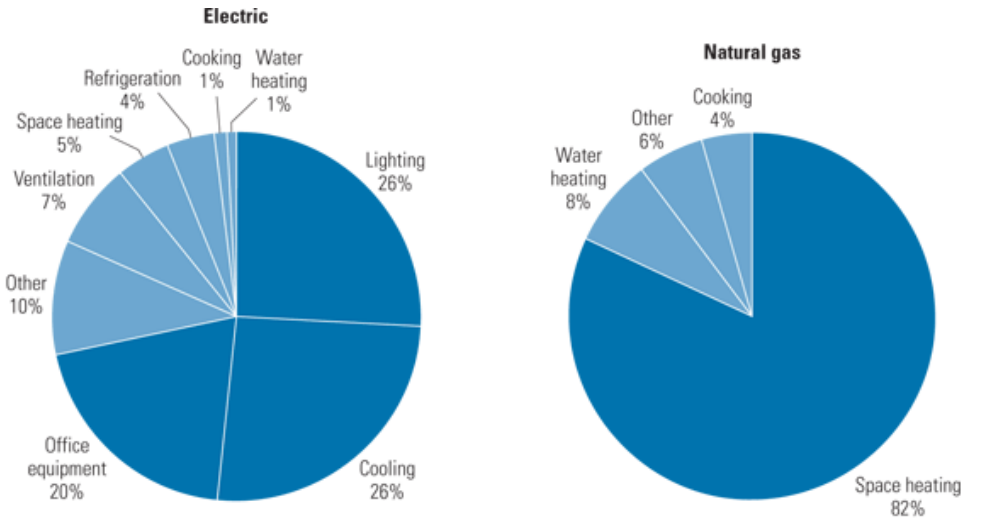
Site End-Use Utility Profile





Most of the electricity consumed by municipal buildings 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 building's energy profile is different, and the following charts represent typical utility profiles for commercial buildings per U.S. Department of Energy.

Typical End-Use Utility Profile for Commercial Buildings



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.

Building	Site EUI kBtu/ft^2/yr	Source EUI Btu/ft^2/yr	Energy Star Rating (1-100)
Carteret Middle School	46.9	102.8	79

The building has an above average Energy Star Rating Score (50 being the median score). By implementing the measures discussed in this report, it is expected that the EUI can be further reduced and the Energy Star Rating 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 Add Hot Water Coils to the Airedale Units

The existing 1996 classroom addition is heated primarily by electric heat pump Airedale vertical unit ventilators. Although efficient by industry standards (high COPs at partial loading) they do employ electric resistance heating elements for heating the code required outside air on the coldest days of the year. Electric heat is efficient—but due to the high cost of electricity relative to natural gas, using electricity as a source of heating energy does not provide a cost savings. This ECM reviews the installation of a hot water coil into the discharge air side of each of the Airedale units, and turning off the electric heating elements. It is estimated that existing boiler capacity is sufficient to provide hot water heat to the fifteen (15) or so of these classrooms.

The calculation uses bin weather data estimation for the occupied and unoccupied bin hours. This is converted to existing energy for the occupied cases only. In order to implement this ECM, extensive field work verification would be required to ensure 1) sufficient boiler capacity, and 2) new hot water piping routing. A base mounted pump would also need to be installed in the mechanical room.

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

ECM-1 Add Hot Water Coils to Airedale Units

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
259,200	0	41,932	(2,195)	(-1,752)	(0.6)	0	61.5	61.5

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

This measure is not recommended.

5.2 ECM-2 Install VFDs on Hot Water Pumps

The existing 7.5 HP base mounted B&G hot water pumps serving the building are not controlled by variable frequency drives (VFDs). Ideally pumps are perfectly selected to match the needs of a system operating a maximum capacity. Most times 1) pumps are over-sized somewhat for safety, and 2) the system is operating at less than full heating capacity. VFDs allow pumps to run at slower RPMs to better meet the needs of the system and in the process, energy is saved.

To implement this ECM, the existing motors would be removed and new motors and VFDs installed in their place. Piping and wiring modifications would be needed.

The order of magnitude implementation costs and savings related to these ECMs are detailed in Appendix C and summarized below:

ECM-2 Install VFDs on Hot Water Pumps

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
11,826	3.6	1,198	0	500	(0.3)	0	23.6	23.6

This measure is recommended.

5.3 ECM-3 Retro-Commission DDC Temperature Controls

The building is equipped with a Siemans DDC controls system. As observed during the site visit, however, the full capabilities of the system are not being realized: unoccupied setback is not implemented, optimum start / stop is not being utilized, and schedules are not in effect. This ECM reviews the re-programming and retro-commissioning of the existing system in order to better benefit from its energy-saving capabilities.

Commissioning is the process of verifying that systems are designed, installed, functionally tested, and capable of being operated and maintained according to the owner's operational needs. Retro-commissioning is the same systematic process applied to existing buildings.

Both controls and components of the heating and cooling systems present saving opportunities during the retro-commissioning process. The DDC system and controls within a building play a crucial role in providing a comfortable building environment. Over time, temperature sensors or thermostats may drift out of synch. Poorly calibrated sensors can increase heating and cooling loads and lead to occupant discomfort. The following procedure is recommended:

- Calibrate the indoor and outdoor building sensors. Calibration of room thermostats, duct thermostats, humidistats, and pressure and temperature sensors should be in accordance with the original design specifications. Calibrating these controls may require specialized skills or equipment and may require outside expertise.
- Inspect damper and valve controls to verify proper functioning. Dampers should also be examined for proper opening and closing. Stiff dampers can cause improper modulation of the amount of outside air being used in the supply airstream. In some cases, dampers may be wired in a single position or disconnected, violating minimum outside air requirements.
- Review building operating schedules. HVAC controls must be adjusted to heat and cool the building properly during occupied hours. Occupancy schedules can change frequently over the life of a building, and control schedules should be adjusted accordingly. When the building is unoccupied, the temperature should be set back to save heating or cooling energy; however, minimal heating and cooling may be required when the building is unoccupied. In cold climates, for example, heating may be needed to keep water pipes from freezing.

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

ECM-3 Retro-Commission DDC Temperature Controls

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
34,870	3.6	18,370	968	4,025	1.3	0	8.7	8.7

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

This measure is recommended.

5.4 ECM-4 Replace Gas DHW Heater w/ Condensing DHW Heater

The building has one gas-fired 50 gallon Rheemglas Fury hot water heater which has a rated thermal efficiency of 81%. The domestic hot water heater serves the toilet rooms and sinks located throughout the office building. Energy savings could be realized by replacing the existing unit with a high efficiency condensing gas fired heater, which can operate at efficiencies up to 94% and will not suffer from 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-4 Replace Gas DHW Heater w/ Condensing DHW Heater

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
17,696	0	0	1,048	1,316	(0.3)	600	13.4	13.0

This measure is recommended.

5.5 ECM-5 Replace Old RTUs with New more efficient RTUs

There are approximately three (3) gas fired roof top heating and air conditioning units that are approximately twenty (20) years old and as such, are approaching the end of their useful lives. These units have standard combustion efficiency and 9.0 EER cooling system efficiency. While gas furnace efficiencies (AFUE) have not increased significantly for packaged roof mounted HVAC equipment, there are new models available that have cooling EERs in the 15-16 range that use digital scroll compressors and variable speed evaporator fans.

It is proposed that the existing units be replaced by three (3) new high efficiency RTUs of equal capacity.

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

ECM-5 Replace Old RTUs with New more Efficient RTUs

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
106,900	11.5	25,343	0	4,327	(0.3)	3,600	24.7	23.9

This measure is recommended due to the age of the RTUs. The incremental cost difference between a standard efficiency replacement RTU and a higher efficient RTU will yield a much more favorable payback and provide continued operating savings for the life of the units.

5.6 ECM-6 Window A/C Unit Controllers

Approximately seventeen (17) window air conditioners were noted throughout the building during the site visit, in miscellaneous offices and locations. These units will occasionally be left 'on' when the room is not occupied, which is wasteful of energy.

This ECM evaluates the installation of programmable "smart" timers that interrupt the electrical supply to the window air conditioners when cooling is not needed due to the room being unoccupied. The timers are configurable to operate as a standalone timer or they can be wirelessly interconnected to provide remote temperature control using software.

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

ECM-6 Window A/C Unit Controllers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
3,500	0	28,860	0	4,416	11.6	0	0.8	0.8

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

This measure is recommended.

5.7.1 ECM-L1 Lighting Replacement / Upgrades

The lighting within the Carteret Middle School offices consists of 2x4 and 2x2 recessed and ceiling mounted troffers having 32W T8 fluorescent lamps with prismatic lenses. Several areas also contain recessed cans outfitted with compact fluorescent lamps. T-12 lamps are found in storage areas and stairwells, and a few compact fluorescent and

incandescent bulbs were noted. A combination of occupancy sensors and wall switches control the interior lighting.

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

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

ECM-L1 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
331,523	34.4	114,933	0	17,915	(0.4)	20,955	18.5	17.3

* 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.

5.7.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

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

This measure recommends installing occupancy sensors for the current lighting system. Using a process similar to that utilized in Section 5.7.1, the energy savings for this measure was calculated by applying the known fixture wattages in the space to the estimated existing and proposed times of operation for each fixture.

The 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
22,140	0	30,302	0	3,848	11.0	1,640	5.8	5.3

* 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.

5.7.3 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
353,663	34.4	133,052	0	20,216	(0.3)	22,595	17.5	16.4

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

This measure is recommended.

5.8 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:

- Re-insulate refrigerant lines
- Set computers monitors to turn off and computers to sleep mode when not in use
- Purchase ENERGY STAR® label Appliances
- Disconnect unnecessary or unused small appliances and electronics when not in use to reduce phantom loads
- Train staff to turn off lights when rooms are unoccupied
- Develop an Energy Master Plan to measure and track energy performance

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 Carteret Board of Education 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 greater than the maximum peak electrical demand of 200 kW for the last 12 month period.

Refer to Appendix D for more information on this program.

6.1.3 New Jersey Pay For Performance Program (P4P)

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

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

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

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

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

Electric

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

Gas

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

Incentive cap: 25% of total project cost

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

Electric

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

Gas

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

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

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

6.1.4 Energy Savings Improvement Plan

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

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

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

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

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

6.1.5 Renewable Energy Incentive Program

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

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

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

7.0 ALTERNATIVE ENERGY SCREENING EVALUATION

7.1 Solar

7.1.1 Photovoltaic Rooftop Solar Power Generation

The building was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The amount of available roof area determines how large of a solar array can be installed on any given roof. The table below summarizes the approximate roof area available on the building and the associated solar array size that can be installed.

Available Roof Area (Ft^2)	Potential PV Array Size (kW)
21,802	170

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 $155/SREC for 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 – 170 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
680,000	170.0	216,730	0	33,160	36,844	20.5	9.7	FS

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

7.1.2 Solar Thermal Hot Water Generation

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

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

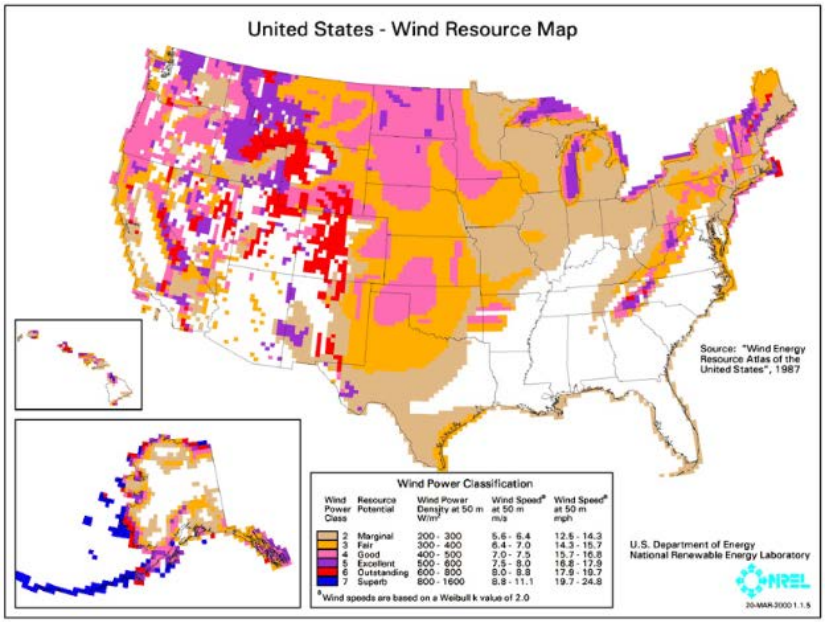
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping).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

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

7.2 Wind Powered Turbines

Wind power is the conversion of kinetic energy from wind into mechanical power that is used to drive a generator which creates electricity by means of a wind turbine. A wind turbine consists of rotor and blades connected to a gearbox and generator that are

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



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

7.3 Combined Heat and Power Plant

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

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. The building has sufficient need for electrical generation and the ability to use most of the thermal byproduct during the winter; however thermal usage during the summer months does not exist. Thermal energy produced by the CHP

plant in the warmer months will be wasted. An absorption chiller could be installed to utilize the heat to produce chilled water; however, there is no chilled water distribution system in the building. CHP is not recommended due to the building's limited summer thermal demand.

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

7.4 Demand Response Curtailment

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

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

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From January 2013 through December 2013 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
252	148	202.2	N	Y

This measure is not recommended for further review because the building usage does not lend itself to load sharing.

8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for Building Name.

The following projects should be considered for implementation:

- Install VFDs onto Hot Water Pumps
- Retro-commission DDC Temperature Controls
- Replace DHW Heater with Condensing DHW Heater
- Replace old RTUs with newer more efficient RTUs
- Install Window A/C Unit Controllers
- Lighting Replacements with Controls (Occupancy Sensors)

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

Electric Savings (kWh)	Natural Gas Savings (therms)	Total Savings ($)	Payback (years)
211,008	2,016	33,515	12.3

If the recommended ECMs are implemented, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	140,853	106,053	25%
Electricity (kWh)	749,800	542,977	28%
Natural Gas (therms)	20,817	18,801	10%
Site EUI (kbtu/SF/Yr)	59.0	47.5	

Next Steps: This energy audit has identified several areas of potential energy savings. The Carteret Board of Education can use this information to pursue incentives offered by the NJBPU's NJ Clean Energy Program.

APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

Carteret School District
Carteret Middle School
300 Carteret Ave. Carteret NJ

Utility Bills: Account Numbers

Account Number	Building	Meter Location	Type	Notes
42 006 032 09	Carteret Middle School		Electric	
7656265581	Carteret Middle School		Gas	

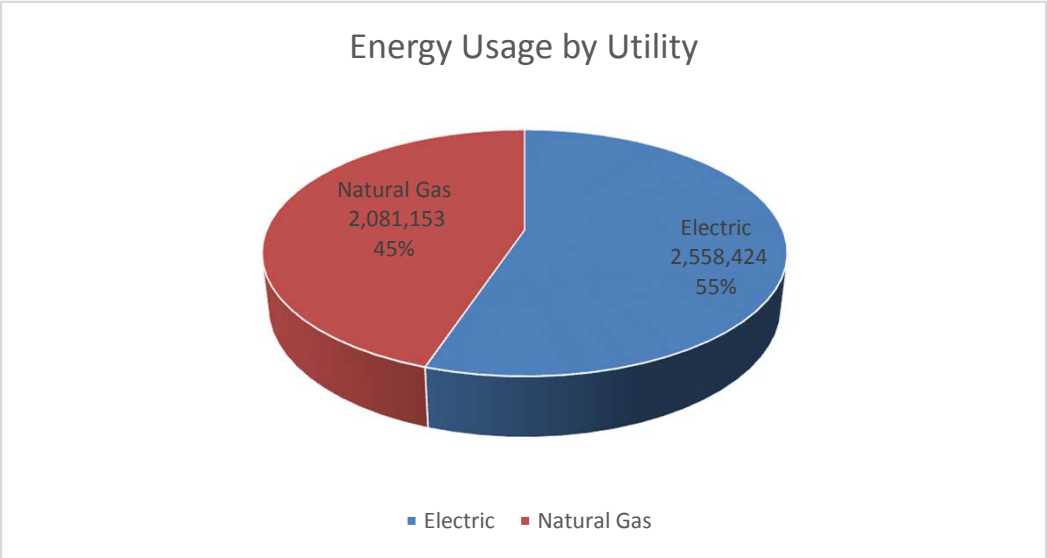
Carteret School District
Carteret Middle School
300 Carteret Ave. Carteret NJ

Annual Utilities

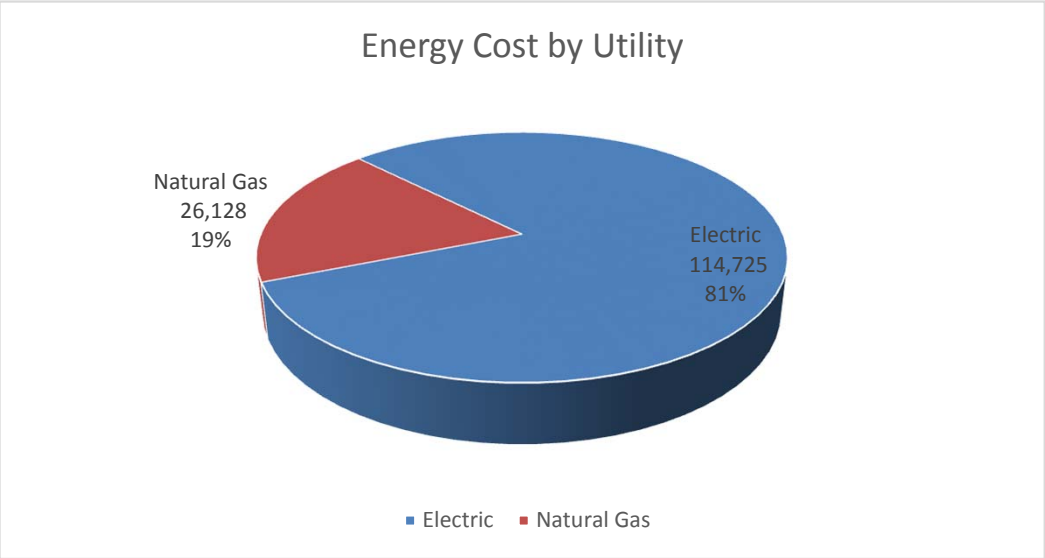
12-month Summary

Electric		
Annual Usage	749,800	kWh/yr
Annual Cost	114,725	$
Blended Rate	0.153	$/kWh
Consumption Rate	0.127	$/kWh
Demand Rate	8.04	$/kW
Peak Demand	252.0	kW
Min. Demand	148.0	kW
Avg. Demand	202.2	kW
Natural Gas		
Annual Usage	20,817	Therms/yr
Annual Cost	26,128	$
Rate	1.255	$/therm
Energy Summary		
Building Area	78,595	SF
Energy Usage Intensity (EUI)	59	KBtu/SF/yr
Energy Cost Index (ECI)	1.79	$/SF/yr
Total Annual Utility Costs	140,852	$

Utility	KBtu	%
Electric	2,558,424	55%
Natural Gas	2,081,153	45%
	4,639,577	100%



Utility	$	%
Electric	114,725	81%
Natural Gas	26,128	19%
	140,852	100%

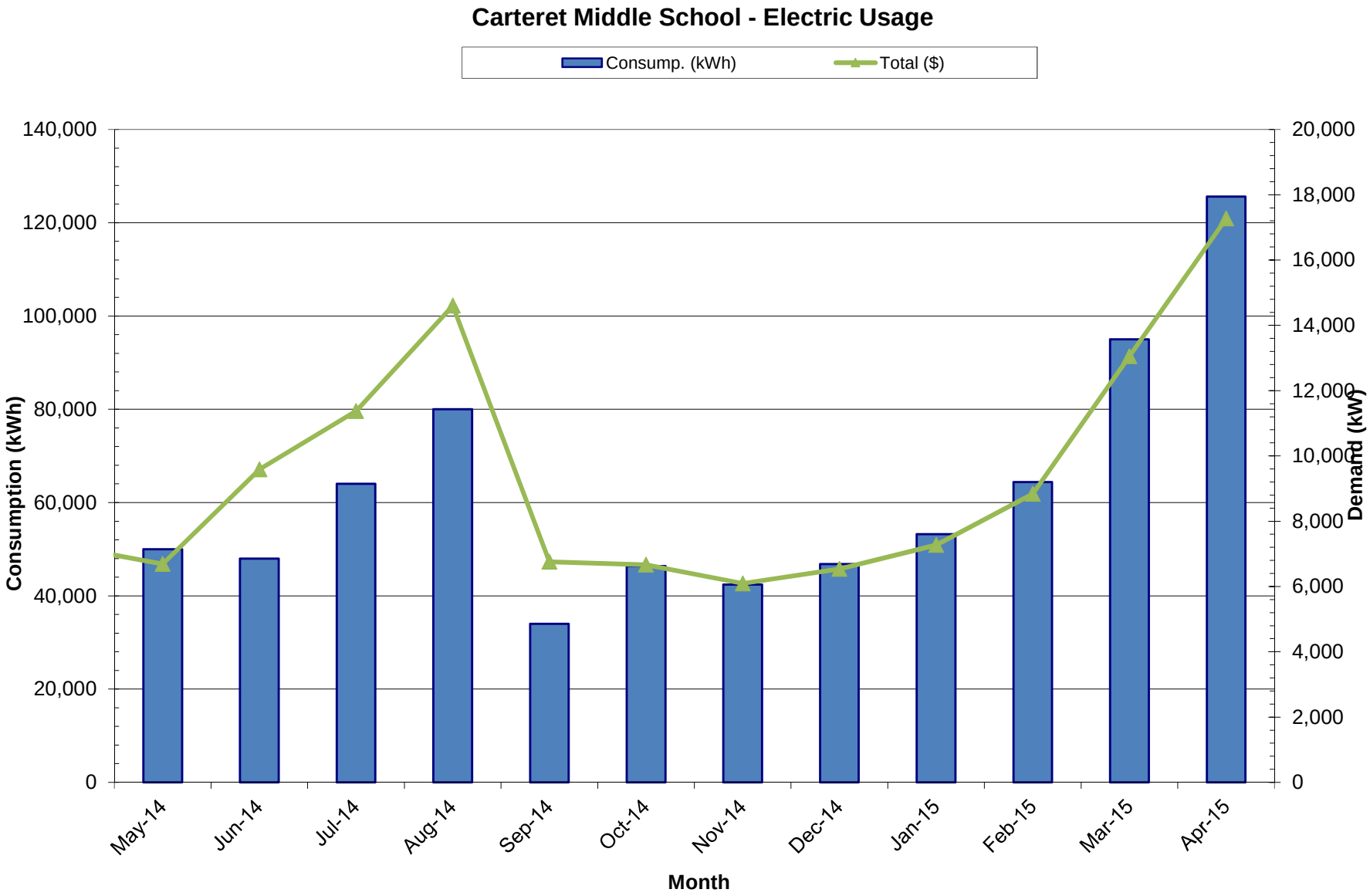


Carteret School District
Carteret Middle School
300 Carteret Ave. Carteret NJ

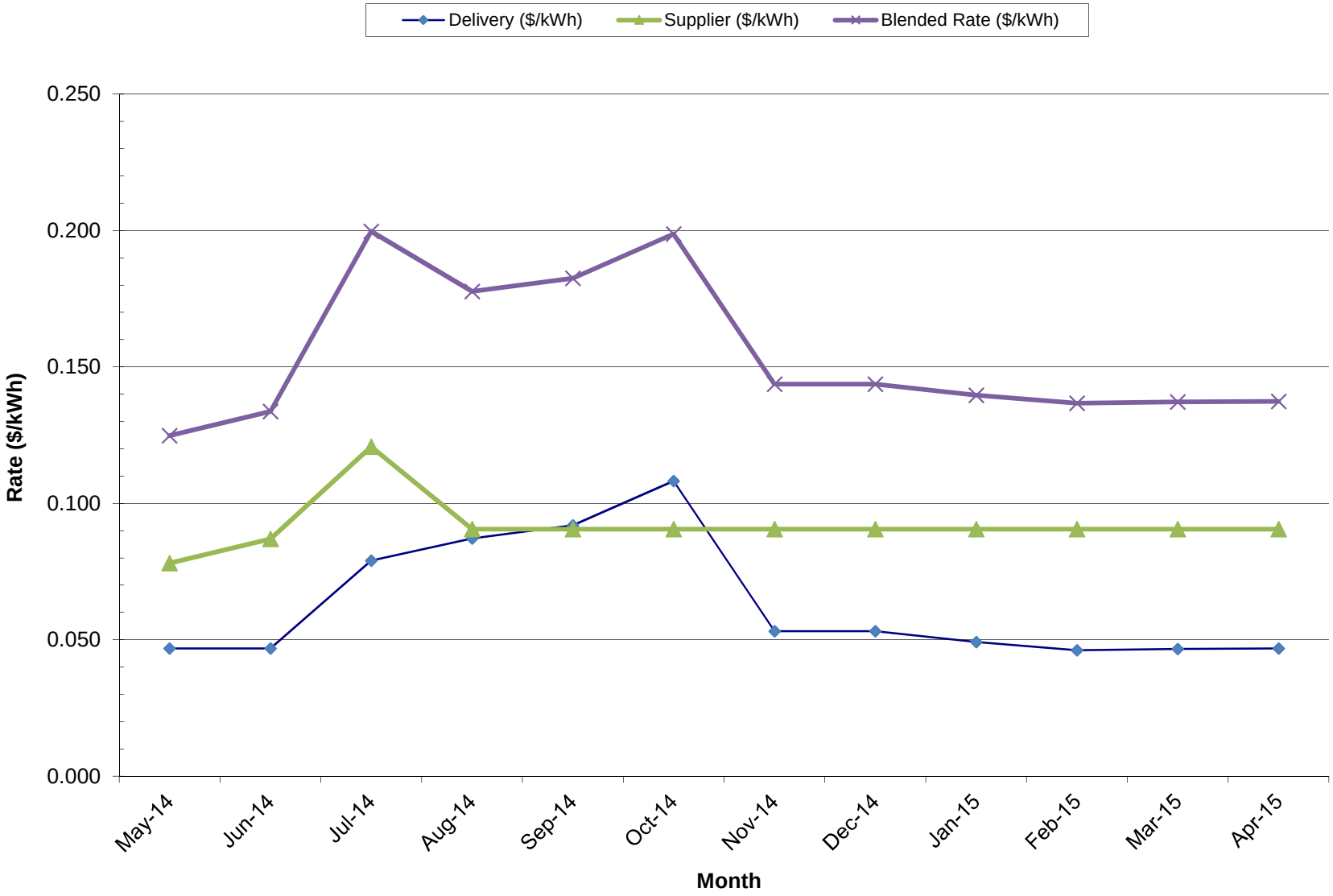
Electric Service
For Service at: 300 Carteret Ave. Carteret NJ
Account No.: 42 006 032 09 **Delivery: PSE&G**
Meter No.: 778015241 **Supply: Energy Direct**

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs				
Month	**Consump. (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Delivery ($/kWh)**	**Supplier ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**	**Blended Rate ($/kWh)**
April-14	58,000	188.00	2,712.58	4,526.50	7,239.08	6572.73	666.35	0.047	0.078	0.113	3.544	0.125
May-14	50,000	148.00	2,340.21	4,345.44	6,685.65	6161.08	524.57	0.047	0.087	0.123	3.544	0.134
June-14	48,000	172.00	3,792.12	5,793.92	9,586.04	7529.55	2056.49	0.079	0.121	0.157	11.956	0.200
July-14	64,000	178.00	5,575.34	5,793.92	11,369.26	8120.89	3,248	0.087	0.091	0.127	18.249	0.178
August-14	80,000	184.00	7,358.56	7,242.40	14,600.96	10160.70	4440.26	0.092	0.091	0.127	24.132	0.183
September-14	34,000	196.00	3,679.93	3,078.02	6,757.95	4374.12	2383.83	0.108	0.091	0.129	12.162	0.199
October-14	46,400	232.00	2,465.71	4,200.59	6,666.30	5831.23	835.07	0.053	0.091	0.126	3.599	0.144
November-14	42,400	208.00	2,254.56	3,838.47	6,093.03	5344.35	748.68	0.053	0.091	0.126	3.599	0.144
December-14	46,800	188.00	2,300.23	4,236.80	6,537.03	5860.34	676.69	0.049	0.091	0.125	3.599	0.140
January-15	53,200	184.00	2,457.62	4,816.20	7,273.82	6611.53	662.29	0.046	0.091	0.124	3.599	0.137
February-15	64,400	252.00	3,005.21	5,830.13	8,835.34	7928.29	907.05	0.047	0.091	0.123	3.599	0.137
March-15	95,000	250.00	4,451.23	8600.35	13051.58	11704.71	1346.88	0.05	0.09	0.12	5.39	0.14
April-15	125,600	248.00	5,897.25	11,370.57	17,267.82	15481.12	1786.70	0.047	0.091	0.123	7.204	0.137
Total (All)	**807,800**	**252.00**	**$48,290.55**	**$73,673.31**	**$121,963.86**	**$101,680.63**	**$20,283.23**	**$0.06**	**$0.09**	**$0.13**	**$7.72**	**$0.15**
Total (last 12-months)	**749,800**	**252.00**	**$45,577.97**	**$69,146.81**	**$114,724.78**	**$95,107.90**	**$19,616.88**	**$0.06**	**$0.09**	**$0.13**	**$8.04**	**$0.15**
Notes	1	2	3	4	5			6	7			8

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 - note, includes 8.875% tax
5.) Total charges (Delivery + Supplier)
6.) Delivery Charges ($) / Consumption (kWh)
7.) Supplier Charges ($) / Consumption (kWh)
8.) Total Charges ($) / Consumption (kWh)
9.) Values highlighted are estimated based on averages


Carteret Middle School - Electric Usage
Consump. (kWh)
Total ($)
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Consumption (kWh)
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Demand (kW)
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
Month

Carteret Middle School- Electric Rates

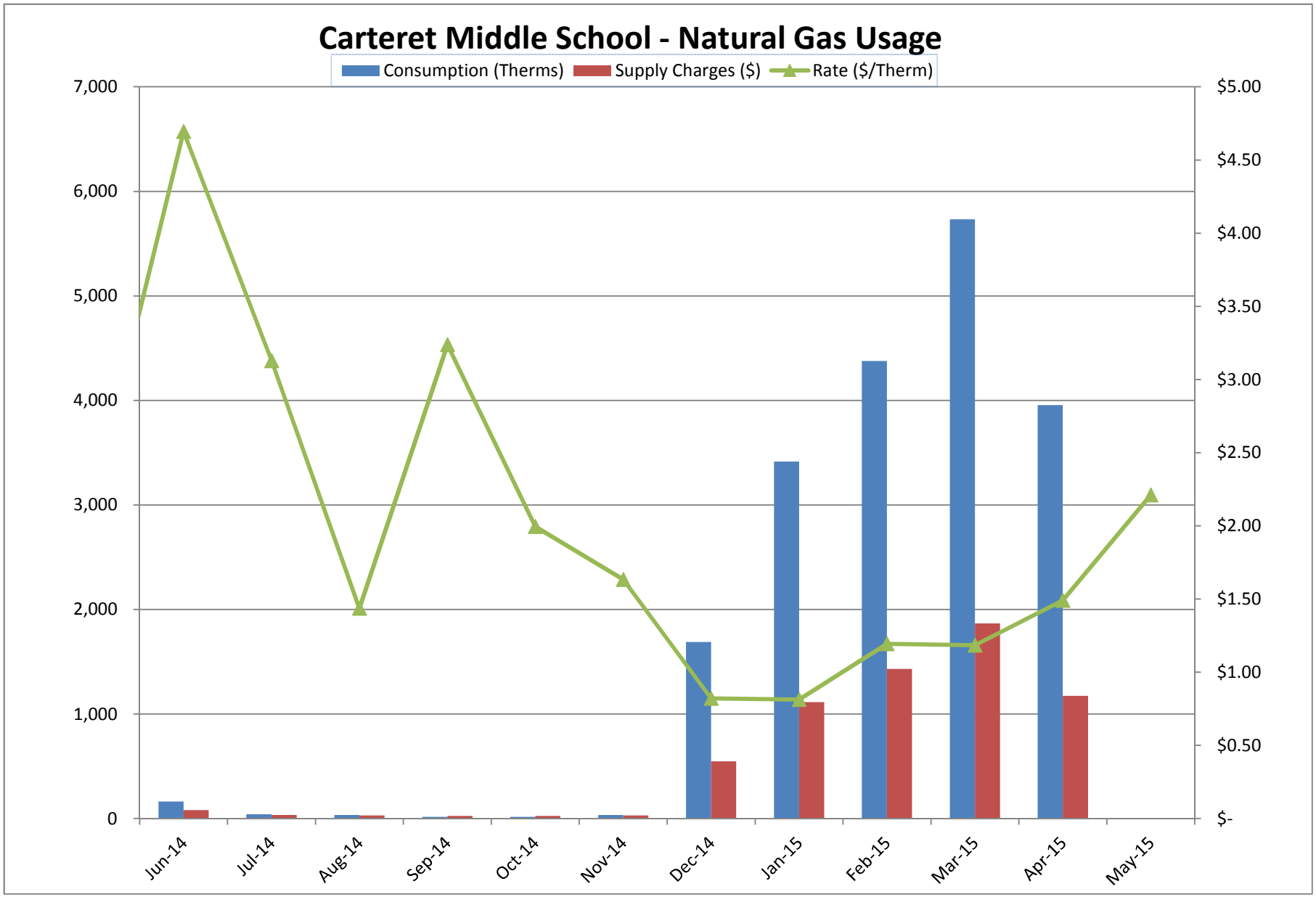


Carteret School District
Carteret Middle School
300 Carteret Ave. Carteret NJ

Natural Gas Service

For Service at: 300 Carteret Ave. Carteret NJ
Account No.: 7656265581
Meter No: 00036003
Delivery: Elizabethtown Gas
Supply: Woodruff Energy

Month	Consumption (Therms)	Delivery Charges ($)	Supply Charges ($)	Total Charges ($)	Rate ($/Therm)
April-14	1,400.50	537.29	2599.47	3,136.76	2.24
May-14	163.30	79.58	686.99	766.57	4.69
June-14	40.00	32.67	92.43	125.10	3.13
July-14	32.80	29.71	17.43	47.14	1.44
August-14	15.20	24.50	24.72	49.22	3.24
September-14	16.40	24.87	7.86	32.73	2.00
October-14	32.90	29.85	23.89	53.74	1.63
November-14	1,688.40	546.27	838.44	1,384.71	0.82
December-14	3,415.60	1,114.54	1663.72	2,778.26	0.81
January-15	4,376.80	1,430.20	3795.63	5,225.83	1.19
February-15	5,733.10	1,867.21	4924.46	6,791.67	1.18
March-15	3,954.60	1,173.89	4718.81	5,892.70	1.49
April-15	1,347.40	396.92	2583.06	2,979.98	2.21
Total (12 Months)	**20,817**	**6,750**	**$ 6,750.21**	**$ 26,127.65**	**$ 1.26**


Carteret Middle School - Natural Gas Usage
Consumption (Therms)
Supply Charges ($)
Rate ($/Therm)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
$5.00
$4.50
$4.00
$3.50
$3.00
$2.50
$2.00
$1.50
$1.00
$0.50
$-
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15

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

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

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

116 Village Blvd. Suite 200 Princeton, NJ 08540	www.greateasternenergy.com	**ACTIVE**
Berkshire Energy Partners, LLC 9 Berkshire Road Landenberg, PA 19350 Attn: Dana A. LeSage, P.E.	(610) 255-5070 www.berkshireenergypartners.com	**C/I** **ACTIVE**
Blue Pilot Energy, LLC 197 State Rte. 18 South Ste. 3000 East Brunswick, NJ 08816	(800) 451-6356 www.bluepilotenergy.com	**R/C** **ACTIVE**
Brick Standard, LLC 235 Hudson Street Suite 1 Hoboken, NJ 07030	(201)706-8101 www.standardalternative.com	**C/I** **ACTIVE**
CCES LLC dba Clean Currents Energy Services 566 Terhune Street Teaneck, NJ 07666	(877) 933-2453 www.cleancurrents.com	**R/C** **ACTIVE**
Champion Energy Services, LLC 1200 Route 22 Bridgewater, NJ 08807	(888) 653-0093 www.championenergyservices.com	**R/C/I** **ACTIVE**
Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	(888) 565-4490 www.4choiceenergy.com	**R/C** **ACTIVE**
Clearview Electric, Inc. 1744 Lexington Avenue Pennsauken, NJ 08110	(888) CLR-VIEW (800) 746- 4702 www.clearviewenergy.com	**R/C/I** **ACTIVE**
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07446	1-866-587-8674 www.commerceenergy.com	**R/C** **ACTIVE**
Community Energy Inc. 51 Sandbrook Headquarters Road Stockton, NJ 08559	(866)946-3123 www.communityenergyinc.com	**R/C/I** **ACTIVE**
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	**C/I** **ACTIVE**

ConocoPhillips Company 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(800) 646-4427 www.conocophillips.com	**C/I** **ACTIVE**
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 www.constellation.com	**R/C/I** **ACTIVE**
Constellation Energy 900A Lake Street, Suite 2 Ramsey, NJ 07446	(877) 997-9995 www.constellation.com	**R** **ACTIVE**
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	(212) 538-3124 www.creditsuisse.com	**C** **ACTIVE**
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 http://www.business.directenergy.com/	**R** **ACTIVE**
Direct Energy Business Marketing, LLC (fka Hess Energy Marketing) 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergy.com	**R** **ACTIVE**
Direct Energy Small Business, LLC (fka Hess Small Business Services, LLC) One Hess Plaza Woodbridge, NJ 07095	(888) 464-4377 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, New Jersey 08002	(800) 282-3331 www.discountenergygroup.com	**R/C** **ACTIVE**
DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102	(877) 332-2450 www.dtesupply.com	**C/I** **ACTIVE**

Energy.me Midwest LLC 90 Washington Blvd Bedminster, NJ 07921	(855) 243-7270 www.energy.me	**R/C/I** **ACTIVE**
Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054	(877) 866-9193 www.energypluscompany.com	**R/C** **ACTIVE**
Ethical Electric Benefit Co. d/b/a Ethical Electric 100 Overlook Center, 2nd Fl. Princeton, NJ 08540	(888) 444-9452 www.ethicalelectric.com	**R/C** **ACTIVE**
Energy Service Providers, Inc., d/b/a New Jersey Gas & Electric 1 Bridge Plaza fl. 2 Fort Lee, NJ 07024	(866) 568-0290 www.njgande.com	**R/C** **ACTIVE**
FirstEnergy Solutions 150 West State Street Trenton, NJ 08608	(866) 625-7318 www.fes.com	**C/I** **ACTIVE**
Gateway Energy Services Corp. 120 Wood Avenue Suite 611 Iselin, NJ 08830	(866)348-4193 www.directenergybusiness.com	**R/C** **ACTIVE**
GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, NJ 08837	(866) 999-8374 www.gdfsuezenergyresources.com	**C/I** **ACTIVE**
GDF Suez Retail Energy Solutions LLC d/b/a THINK ENERGY 333 Thornall St. Sixth Floor Edison, NJ 08819	1-866-252-0078 www.mythinkenergy.com	**R/C/I** **ACTIVE**
Glacial Energy of New Jersey, Inc. 21 Pine Street, Suite 237 Rockaway, NJ 07866	(888) 452-2425 www.glacialenergy.com	**C/I** **ACTIVE**
Global Energy Marketing LLC 129 Wentz Avenue Springfield, NJ 07081	(800) 542-0778 www.globalp.com	**R/C/I** **ACTIVE**

Green Mountain Energy Company 211 Carnegie Center Drive Princeton, NJ 08540	(866) 767-5818 www.greenmountain.com/commercial-home	**C/I** **ACTIVE**
Harborside Energy LLC 101 Hudson Street Suite 2100 Jersey City, NJ 07302	(877) 940-3835 www.harborsideenergynj.com	**R/C** **ACTIVE**
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	**R/C/I** **ACTIVE**
Hudson Energy Services, LLC 7 Cedar Street Ramsey, New Jersey 07446	(877) Hudson 9 www.hudsonenergyservices.com	**C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	(877) 887-6866 www.idtenergy.com	**R/C** **ACTIVE**
Independence Energy Group, LLC 211 Carnegie Center Princeton, NJ 08540	(877) 235-6708 www.chooseindependence.com	**R/C** **ACTIVE**
Inspire Energy Holdings LLC 923 Haddonfield Road 3rd Fl. Building B2 Cherry Hill, NJ 08002	(866) 403-2620 www.inspireenergy.com	**R/C/I**
Integrys Energy Services, Inc. 33 Wood Ave, South, Suite 610 Iselin, NJ 08830	(800) 536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Jsynergy, LLC 445 Central Ave. Suite 204 Cedarhurst, NY 11516	(516) 331-2020 Jsynergyllc.com	**R/C/I** **ACTIVE**
Kuehne Chemical Company, Inc. 86 North Hackensack Avenue South Kearney, NJ 07032	(973) 589-0700 kuehnechemical@comcast.net	**I**

Liberty Power Delaware, LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	(866) 769-3799 www.libertypowercorp.com	**C/I** **ACTIVE**
Liberty Power Holdings, LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	(866) 769-3799 www.libertypowercorp.com	**R/C/I** **ACTIVE**
Linde Energy Services 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.linde.com	**C/I** **ACTIVE**
Marathon Power LLC 302 Main Street Paterson, NJ 07505	(888) 779-7255 www.mecny.com	**R/C/I** **ACTIVE**
MP2 Energy NJ, LLC 111 River Street, Suite 1204 Hoboken, NJ 07030	(877) 238-5343 www.mp2energy.com	**R/C/I** **ACTIVE**
Natures Current, LLC 95 Fairmount Avenue Philadelphia, Pennsylvania 19123	(215) 464-6000 www.naturescurrent.com	**R/C/I** **ACTIVE**
MPower Energy NJ LLC One University Plaza, Suite 507 Hackensack, NJ 07601	(877) 286-7693 www.mpowerenergy.com	**R/C/I** **ACTIVE**
NATGASCO, Inc. (Supreme Energy, Inc.) 532 Freeman St. Orange, NJ 07050	(800) 840-4427 www.supremeenergyinc.com	**R/C/I** **ACTIVE**
New Jersey Gas & Electric 10 North Park Place Suite 420 Morristown, NJ 07960	(866) 568-0290 www.njgande.com	**R/C/** **ACTIVE**
NextEra Energy Services New Jersey, LLC 651 Jernee Mill Road Sayreville, NJ 08872	(877) 528-2890 Commercial (800) 882-1276 Residential www.nexteraenergyservices.com	**R/C/I** **ACTIVE**
Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.noblesolutions.com	**C/I** **ACTIVE**

Nordic Energy Services, LLC 50 Tice Boulevard, Suite 340 Woodcliff Lake, NJ 07677	(877) 808-1027 www.nordiceenergy.us.com	**R/C/I** **ACTIVE**
North American Power and Gas, LLC 222 Ridgedale Avenue Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
North Eastern States, Inc. d/b/a Entrust Energy 90 Washington Valley Road Bedminster, NJ 07921	(888) 535-6340 www.entrustenergy.com	**R/C/I** **ACTIVE**
Oasis Power, LLC d/b/a Oasis Energy 11152 Westheimer, Suite 901 Houston, TX 77042	(800)324-3046 www.oasisenergy.com	**R/C** **ACTIVE**
Palmco Power NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Park Power, LLC 1200 South Church St. Suite 23 Mount Laurel, NJ 08054	(856) 778-0079 www.parkpower.com	**R/C/I** **ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**
Power Management Co., LLC b/b/a PMC Lightsavers Limited Liability Company 1600 Moseley Road Victor, NY 14564	(585) 249-1360 www.powermanagementco.com	**C/I** **ACTIVE**
PPL Energy Plus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com	**C/I** **ACTIVE**
PPL EnergyPlus Retail, LLC 788 Shrewsbury Avenue, Suite 220 Tinton Falls, NJ 07724	(732) 741-0505 – 2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Progressive Energy Consulting, LLC	(917) 837-7400	**R/C/I**

PO Box 4582 Wayne, New Jersey 07474	Progressivenrg@optionline.net	**ACTIVE**
Prospect Resources, Inc. 208 W. State Street Trenton, NJ 08608-1002	(847) 673-1959 www.prospectresources.com	**C** **ACTIVE**
Public Power & Utility of New Jersey, LLC One International Blvd, Suite 400 Mahwah, NJ 07495	(888) 354-4415 www.ppandu.com	**R/C/I** **ACTIVE**
Reliant Energy 211 Carnegie Center Princeton, NJ 08540	(877) 297-3795 (877) 297-3780 www.reliant.com	**R/C/I** **ACTIVE**
ResCom Energy LLC 18C Wave Crest Ave. Winfield Park, NJ 07036	(888) 238-4041 http://rescomenergy.com	**R/C/I** **ACTIVE**
Residents Energy, LLC 550 Broad Street Newark, NJ 07102	(888) 828-7374 www.residentsenergy.com	**R/C**
Respond Power LLC 1001 East Lawn Drive Teaneck, NJ 07666	(877) 973-7763 www.majorenergy.com	**R/C/I** **ACTIVE**
Save on Energy, LLC 1101 Red Ventures Drive Fort Mill, SC 29707	1 (877)-658-3183 www.saveonenergy.com	**R/C**
SFE Energy One Gateway Center Suite 2600 Newark, NJ 07012	1 (877) 316-6344 www.sfeenergy.com	**R/C/I** **ACTIVE**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	(800) 695-0666 www.sjnaturalgas.com	**C** **ACTIVE**
SmartEnergy Holdings, LLC 100 Overlook Center 2nd Floor Princeton, NJ NJ 08540 United States of America	(800) 443-4440 www.smartenergy.com	**R/C/I** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 266-6020 www.southjerseyenergy.com	**R/C/I** **ACTIVE**

Spark Energy Gas, LP/ Spark Energy 2105 City West Blvd. Suite 100 Houston, TX 77042	(713)600-2600 www.sparkenergy.com	**R/C/I** **ACTIVE**
Sperian Energy Corp. 1200 Route 22 East, Suite 2000 Bridgewater, NJ 08807	(888) 682-8082 www.sperianenergy.com	**R/C/I** **ACTIVE**
Starion Energy PA Inc. 101 Warburton Avenue Hawthorne, NJ 07506	(800) 600-3040 www.starionenergy.com	**R/C/I** **ACTIVE**
Stream Energy New Jersey, LLC 309 Fellowship Rd., Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	**R/C** **ACTIVE**
Summit Energy Services, Inc. 10350 Ormsby Park Place Suite 400 Louisville, KY 40223	1 (800) 90-SUMMIT www.summitenergy.com	**C/I** **ACTIVE**
Texas Retail Energy LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663 Attn: Chris Hendrix	(866) 532-0761 Texasretailenergy.com	**C/I** **ACTIVE**
TransCanada Power Marketing Ltd. 190 Middlesex Essex Turnpike, Suite 200 Iselin, NJ 08830	(877) MEGAWAT www.transcanada.com/powermarketing	**C/I** **ACTIVE**
TriEagle Energy, LP 90 Washington Valley Rd Bedminster, NJ 07921	(877) 933-2453 www.trieagleenergy.com	**R/C/I** **ACTIVE**
UGI Energy Services, Inc. dba UGI Energy Link 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(800) 427-8545 www.ugienergylink.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 2001 Route 46 Waterview Plaza Suite 301 Parsippany, NJ 07054	(800) 388-3862 www.lowcostpower.com	**R/C** **ACTIVE**

Viridian Energy 2001 Route 46, Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	**R/C/I** **ACTIVE**
XOOM Energy New Jersey, LLC 744 Broad Street. 16th Floor Newark, NJ 07102	(888) 997-8979 www.xoomenergy.com	**R/C/I** **ACTIVE**
YEP Energy 89 Headquarters Plaza North #1463 Morristown, NJ 07960	(855) 363-7736 www.yepenergyNJ.com	**R/C/I** **ACTIVE**
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	(855) 732-2493 www.thisisyourenergy.com	**R/C/I** **ACTIVE**

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

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

Supplier	Telephone & Web Site	*Customer Class
Ambit Northeast, LLC d/b/a Ambit Energy 103 Carnegie Center Suite 300 Princeton, NJ 08540	877-282-6284 www.ambitenergy.com	**R/C** **ACTIVE**
Amerigreen Energy, Inc. **333 Sylvan Avenue Suite 206** **Englewood Cliffs, NJ 07632**	(888)559-4567 www.amerigreen.com	**R/C/I** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	888-850-1872 www.AstralEnergyLLC.com	**R/C/I** **ACTIVE**
BBPC, LLC Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	**C** **ACTIVE**
Choice Energy, LLC **4257 US Highway 9, Suite 6C** **Freehold, NJ 07728**	(888) 565-4490 www.4choiceenergy.com	**R/C/I**
Clearview Electric Inc. **d/b/a Clearview Gas** 1744 Lexington Ave. Pennsauken, NJ 08110	800-746-4720 www.clearviewenergy.com	**R/C** **ACTIVE**
Colonial Energy, Inc. 83 Harding Road Wyckoff, NJ 07481	845-429-3229 www.colonialgroupinc.com	**C/I** **ACTIVE**
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07746	888 817-8572 www.commerceenergy.com	**R** **ACTIVE**
Compass Energy Services, Inc. 33 Wood Avenue South, 610 Iselin, NJ 08830	866-867-8328 www.compassenergy.net	**C/I** **ACTIVE**

Compass Energy Gas Services, LLC 33 Wood Avenue South Suite 610 Iselin, NJ 08830	866-867-8328 www.compassenergy.net	**C/I** **ACTIVE**
ConocoPhillips Company 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-646-4427 www.conocophillips.com	**C/I** **ACTIVE**
Consolidated Edison Energy, Inc. **d/b/a Con Edison Solutions** 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-686-1383 x2130 www.conedenergy.com	
Consolidated Edison Solutions, Inc. Cherry Tree Corporate Center 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-665-0955 www.conedsolutions.com	**C/I** **ACTIVE**
Constellation NewEnergy-Gas Division, LLC 116 Village Boulevard, Suite 200 Princeton, NJ 08540	800-785-4373 www.constellation.com	**C/I** **ACTIVE**
Constellation Energy Gas Choice, Inc. 116 Village Blvd., Suite 200 Princeton, NJ 08540	800-785-4373 www.constellation.com	**R/C/I** **ACTIVE**
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 http://www.business.directenergy.com/	**R** **ACTIVE**
Direct Energy Business Marketing, LLC (fka Hess Energy Marketing) One Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergy.com	**R** **ACTIVE**

Direct Energy Small Business, LLC (fka Hess Small Business Services, LLC) One Hess Plaza Woodbridge, NJ 07095	(888) 464-4377 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Gateway Energy Services Corp. 120 Wood Avenue Suite 611 Iselin, NJ 08830	(866) 348-4193 www.gesc.com	**R/C** **ACTIVE**
Glacial Energy of New Jersey, Inc. 21 Pine Street, Suite 237 Rockaway, NJ 07866	888-452-2425 www.glacialenergy.com	**C/I** **ACTIVE**
Global Energy Marketing, LLC 129 Wentz Avenue Springfield, NJ 07081	800-542-0778 www.globalp.com	**C/I** **ACTIVE**
Great Eastern Energy 116 Village Blvd., Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	**C/I** **ACTIVE**
Greenlight Energy 330 Hudson Street, Suite 4 Hoboken, NJ 07030	718-204-7467 www.greenlightenergy.us	**C** **ACTIVE**
Harborside Energy LLC 101 Hudson Street, Suite 2100 Jersey City, NJ 07302	877-940-3835 www.harborsideenergynj.com	**R/C** **ACTIVE**
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	888 264-4908 www.hikoenergy.com	**R/C/I** **ACTIVE**
Hudson Energy Services, LLC 7 Cedar Street Ramsey, NJ 07446	877- Hudson 9 www.hudsonenergyservices.com	**C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	877-887-6866 www.idtenergy.com	**R/C** **ACTIVE**

Infinite Energy dba Intelligent Energy 1200 Route 22 East Suite 2000 Bridgewater, NJ 08807-2943	(800) 927-9794 www.InfiniteEnergy.com	**R/C/I** **ACTIVE**
Integrys Energy Services-Natural Gas, LLC 101 Eisenhower Parkway Suite 300 Roseland, NJ 07068	(800) 536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Jsynergy LLC 445 Cental Ave. Suite 204 Cedarhurst, NY 11516	(516) 331-2020 www.Jsnergyllc.com	**R/C/I** **ACTIVE**
Major Energy Services, LLC 1001 East Lawn Drive Teaneck NJ 07666	888-625-6760 www.majorenergy.com	**R/C/I** **ACTIVE**
Marathon Power LLC 302 Main Street Paterson, NJ 07505	888-779-7255 www.mecny.com	**R/C/I** **ACTIVE**
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	1-877-750-7046 www.metromediaenergy.com	**C/I** **ACTIVE**
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	888-53-Metro www.metroenergy.com	**R/C** **ACTIVE**
MPower Energy NJ LLC One University Plaza, Suite 507 Hackensack, NJ 07601	877-286-7693 www.mpowerenergy.com	**R/C/I** **ACTIVE**
NATGASCO (Supreme Energy, Inc.) 532 Freeman Street Orange, NJ 07050	800-840-4427 www.supremeenergyinc.com	**R/C/I** **ACTIVE**
New Energy Services LLC 101 Neptune Avenue Deal, New Jersey 07723	800-660-3643 www.newenergyservicesllc.com	**R/C/I** **ACTIVE**
New Jersey Gas & Electric 10 North Park Place Suite 420 Morristown, NJ 07960	866-568-0290 www.njgande.com	**R/C** **ACTIVE**

Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th fl. Woodbridge, NJ 07095	877-273-6772 www.noblesolutions.com	**C/I** **ACTIVE**
North American Power & Gas, LLC d/b/a North American Power 197 Route 18 South Ste. 300 New Brunswick, NJ 08816	888- 313-8086 www.napower.com	**R/C/I** **ACTIVE**
North Eastern States, Inc. d/b/a Entrust Energy 90 Washington Valley Road Bedminster, NJ 07921	(888) 535-6340 www.entrustenergy.com	**R/C/I** **ACTIVE**
Oasis Power, LLC d/b/a Oasis Energy 11152 Westheimer, Suite 901 Houston, TX 77042	(800)324-3046 www.oasisenergy.com	**R/C** **ACTIVE**
Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	855-32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**
PPL EnergyPlus, LLC Shrewsbury Executive Offices 788 Shrewsbury Avenue Suite 2200 Tinton Falls, NJ 07724	(732) 741-0505 www.pplenergyplus.com	**C/I** **ACTIVE**
PPL EnergyPlus Retail, LLC Shrewsbury Executive Offices 788 Shrewsbury Avenue, Suite 220 Tinton Falls, NJ 07724	(732) 741-0505 – 2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Public Power & Utility of New Jersey, LLC One International Blvd, Suite 400 Mahwah, NJ 07495	(888) 354-4415 www.ppandu.com	**R/C/I** **ACTIVE**

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

Stream Energy New Jersey, LLC 309 Fellowship Road Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	**R/C** **ACTIVE**
Summit Energy Services, Inc. 10350 Ormsby Park Place Suite 400 Louisville, KY 40223	1 (800) 90-SUMMIT www.summitenergy.com	**C/I** **ACTIVE**
Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	877-797-8786 www.systrumenergy.com	**R/C/I** **ACTIVE**
Tiger Natural Gas, Inc. dba Tiger, Inc. 234 20th Avenue Brick, NJ 008724	888-875-6122 www.tigernaturalgas.com	**R/C/I** **ACTIVE**
UGI Energy Services, Inc. dba UGI Energy Link 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-427-8545 www.ugienergylink.com	**C/I** **ACTIVE**
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergylink.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 2001 Route 46 Waterview Plaza, Suite 301 Parsippany, NJ 07054	800-388-3862 www.lowcostpower.com	**R/C** **ACTIVE**
Viridian Energy PA LLC 2001 Route 46, Waterview Plaza Suite 230 Parsippany, NJ 07054	866-663-2508 www.viridian.com	**R/C** **ACTIVE**
Vista Energy Marketing, L.P. 197 State Route 18 South, Suite 3000 South Wing East Brunswick, NJ 08816	888-508-4782 www.vistaenergymarketing.com	**R/C/I** **ACTIVE**
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	800-557-1121 www.woodruffenergy.com	**R/C/I** **ACTIVE**

Woodruff Energy US LLC 73 Water Street, P.O. Box 777 Bridgeton, NJ 08302	856-455-1111 800-557-1121 www.woodruffenergy.com	**C/I** **ACTIVE**
XOOM Energy New Jersey, LLC 744 Broad Street. 16th Floor Newark, NJ 07102	888-997-8979 www.xoomenergy.com	**R/C/I** **ACTIVE**
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	855-732-2493 www.thisisyourenergy.com	**R/C/I** **ACTIVE**

Back to main supplier information page

APPENDIX B

Equipment Inventory

Carteret School District
CHA Project# 30201
Carteret Middle School

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.
B-1	1	Burnham	MPC12	65041273	Boiler	2,325,000 BTU/h	84%	Boiler Room	Building	2008	18	
B-2	1	Burnham	MPC13	65041274	Boiler	2,325,000 BTU/h	84%	Boiler Room	Building	2008	18	
WH-1	1	AO Smith	N/A	N/A	Water Heater	N/A	N/A	Boiler Room	Building	N/A	N/A	
P-1	1	Bell & Gossett	36B103T848H1	F0804150664	Motor	7.5 HP	89%	Boiler Room	Hot water pumps	2008	8	
P-2	1	Bell & Gossett	36B103T848H1	F0804150724	Motor	7.5 HP	89%	Boiler Room	Hot water pumps	2008	8	
CU-1	1	Fujitsu	N/A	N/A	Split Unit (Indoor)	N/A	N/A	Room	Room	N/A	N/A	
B-3	1	Burnham	MPC7	65041254	Boiler	1,216,000 BTU/h	84%	Mechanical Room	Building	2008	18	
WH-2	1	AO Smith	FCG 75 270	J06A029547	Water Heater	75,100 BTU/h	N/A	Utility Room	Building	N/A	N/A	
P-3	1	Bell & Gossett	FVH 145TTDR5630DD	N/A	Motor	1.5 HP	N/A	Utility Room	Hot water pumps	N/A	8	
P-4	1	Bell & Gossett	FVH 145TTDR5630DD	N/A	Motor	1.5 HP	N/A	Utility Room	Hot water pumps	N/A	8	
AC-1	1	Quincy	QC00503D00204	20050211-0088	Air Compressor	.5 HP	N/A	Utility Room	N/A	N/A	N/A	
UH-1	1	N/A	N/A	N/A	Unit Space Heater	N/A	N/A	Utility Room	N/A	N/A	N/A	
Window AC	1	Friedrich	N/A	N/A	Window AC unit	N/A	N/A	Classroom	Classroom	N/A	N/A	
Unit Ventilator	XX	Nesbitt	N/A	N/A	Unit Ventilator	N/A	N/A	Classroom	Classroom	1961	exceeded	
UH-2	1	N/A	N/A	N/A	Unit Space Heater	N/A	N/A	Utility Room	Utility Room	N/A	N/A	
UH-3	1	Dayton	N/A	N/A	Unit Space Heater	N/A	N/A	Classroom	Classroom	N/A	N/A	
RTU-1	1	Carrier	48TCED14A3A6A0A0A0	5110G10618	Heating/cooling	224,000/140,000 BTU/h	82%	Roof	Building	N/A	N/A	
RTU-2	1	Carrier	48HCEB06A20A0C0	2513C86894	Heating	115,000 BTU/h	81%	Roof	Building	N/A	N/A	
EF-1		ACME	N/A	UUF543101	Exhaust Fan	.5 HP	N/A	Roof	Building	N/A	N/A	
RCU-1	1	Troulsen	N/A	N/A	Condensing Unit (commercial Refridgerator)	N/A	N/A	Kitchen	N/A	N/A	N/A	
RCU-2	1	Cres Cor	N/A	N/A	Condensing Unit (commercial Refridgerator)	N/A	N/A	Kitchen	N/A	N/A	N/A	
WH-3	2	AO Smith	N/A	N/A	Water Heater	N/A	N/A	Kitchen	Kitchen	N/A	0	
RTU-3	1	Lennox	LGA180SH1G	5696E 00072	Heating/Cooling	470,000/180,000 BTU/h	Thermal: 80%	Roof	Building	1996	1	
RTU-4	1	Lennox	LGA180SH1G	5696C 04254	Heating/Cooling	470,000/180,000 BTU/h	Thermal: 80%	Roof	Building	1996	1	
AHU-1	1	Sterling	N/A	N/A	Heating/cooling	N/A	N/A	Roof	Building	N/A	N/A	
RTU-5	1	Carrier	50HJ-006---531--	262029G30145	Cooling	61,000 BTU/h	11 EER	Roof	Building	N/A	N/A	
RTU-6	1	Carrier	50MH054400	E756850	Rooftop unit	N/A	N/A	Roof	Building	N/A	N/A	

APPENDIX C

ECM Calculations

Carteret Board of Education
CHA Project Number: 30201

Rate of Discount (used for NPV) 3.0%

Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
$ 0.153	$/kWh blended		0.000420205	78,595	Electric	Natural Gas	Fuel Oil
$ 0.127	$/kWh supply	749,800	0.000420205		$ 114,725	$ 26,128	
$ 8.04	$/kW	252.0	0				
$ 1.26	$/Therm	20,817	0.00533471				
$ 5.56	$/kgals	1	0				
	$/Gal						

Carteret Middle 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
N	ECM-1	Add Hot Water Coils to Airedale Units	0.0	41,932	(1,752)	0	0	4,216	$ 259,200	61.5	25.0	8.3		N	61.5	0.0	1,048,298	(43,812)	0	$ 105,406	(0.6)	($185,782)	-6.0%
Y	ECM-2	Install VFDs on Hot Water Pumps	3.6	1198	0	0	0	500	$ 11,826	23.6	15.0	0.5	$ -	N	23.6	54.1	17,963	0	0	$ 7,969	(0.3)	($5,856)	-5.2%
Y	ECM-3	Retro-Commission DDC Temperature Controls	0.0	18,370	968	0	0	4,025	$ 34,870	8.7	20.0	12.9	$ -	N	8.7	0.0	367,402	19,360	0	$ 80,509	1.3	$25,019	9.7%
Y	ECM-4	Replace Gas DHW Heater w/ Condensing DHW Heater	0.0	0	1,048	0	0	1,316	$ 17,696	13.4	10.0	5.6	$ 600	N	13.0	0.0	0	10,484	0	$ 13,158	(0.3)	($5,872)	-4.5%
Y	ECM-5	Replace Old RTUs with High Efficient RTUs	11.5	25,343	0	0	0	4,327	$ 106,900	24.7	15.0	10.6	$ 3,600	N	23.9	172.3	380,143	0	0	$ 74,784	(0.3)	($51,648)	-5.3%
Y	ECM-6	Install Window A/C Unit Controllers	0.0	28,860	0	0	0	4,416	$ 3,500	0.8	10.0	12.1		N	0.8	0.0	288,603	0	0	$ 44,156	11.6	$34,166	126.1%
N	ECM-L1	Lighting Replacements / Upgrades	34.4	114,933	0	0	0	17,915	$ 331,523	18.5	10.0	48.3	$ 20,955	N	17.3	344.0	1,149,330	0	0	$ 209,037	(0.4)	($157,749)	-8.9%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	30,302	0	0	0	3,848	$ 22,140	5.8	10.0	12.7	$ 1,640	N	5.3	0.0	303,020	0	0	$ 46,362	1.1	$12,324	13.5%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	34.4	133,052	0	0	0	20,216	$ 353,663	17.5	10.0	55.9	$ 22,595	N	16.4	344.0	1,330,520	0	0	$ 236,759	(0.3)	($158,621)	-8.1%
		Total (Not Including ECMs L1, L2)	**49.5**	**248,755**	**264**	**0**	**0**	**$ 39,016**	**$ 787,655**	**20.2**	**11.7**	**127**	**$ 26,795**		**19.5**	**570**	**3,432,928**	**(13,968)**	**-**	**$ 562,740**	**(0.3)**	**($399,860)**	**-8.5%**
		Recommended Measures (highlighted green above)	**49.5**	**206,823**	**2,016**	**0**	**0**	**$ 34,800**	**$ 528,455**	**15.2**	**10.0**	**98**	**$ 26,795**	**0**	**14.4**	**570**	**2,384,630**	**29,844**	**-**	**$ 457,334**	**(0.1)**	**($204,812)**	**-6.2%**
		% of Existing	**20%**	**27.58%**	**9.69%**	**0**	**0**																

City: Newark, NJ

	Occupied Hours/Week		70 Building Operating Hours	70 Auditorium Occupied Hours	70 Gymnasium Occupied Hours	70 Library Occupied Hours	50 Classrooms Occupied Hours
Temp	Enthalpy h (Btu/lb)	Bin Hours					
102.5							
97.5	35.4	6	3	3	3	3	2
92.5	37.4	31	13	13	13	13	9
87.5	35.0	131	55	55	55	55	39
82.5	33.0	500	208	208	208	208	149
77.5	31.5	620	258	258	258	258	185
72.5	29.9	664	277	277	277	277	198
67.5	27.2	854	356	356	356	356	254
62.5	24.0	927	386	386	386	386	276
57.5	20.3	600	250	250	250	250	179
52.5	18.2	730	304	304	304	304	217
47.5	16.0	491	205	205	205	205	146
42.5	14.5	656	273	273	273	273	195
37.5	12.5	1,023	426	426	426	426	304
32.5	10.5	734	306	306	306	306	218
27.5	8.7	334	139	139	139	139	99
22.5	7.0	252	105	105	105	105	75
17.5	5.4	125	52	52	52	52	37
12.5	3.7	47	20	20	20	20	14
7.5	2.1	34	14	14	14	14	10
2.5	1.3	1	0	0	0	0	0
-2.5							
-7.5							

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

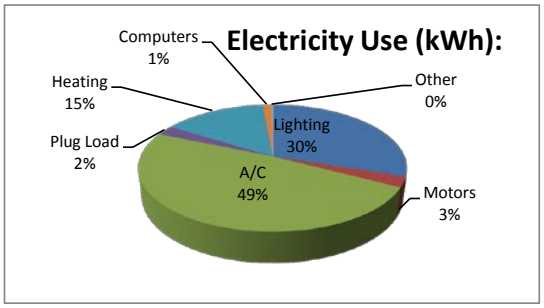
Heating System Efficiency	80%
Cooling Eff (kW/ton)	1.2

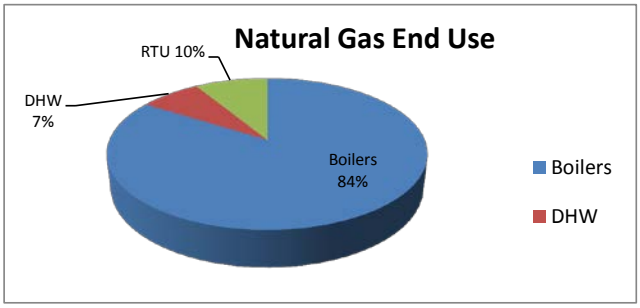
Heating		
Hours	4,427	Hrs
Weighted Avg	40	F
Avg	28	F

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

Carteret Board of Education
CHA Project Number: 30201
Carteret Middle School

Utility End Use Analysis			
Electricity Use (kWh):		**Notes/Comments:**	
749,800	Total	Based on utility analysis	
225,000	Lighting	From Lighting Calculations	30.01%
20,000	Motors	Calculated	2.67%
365,000	A/C	Estimated	48.68%
19,000	Plug Load	Estimated	2.53%
110,000	Heating	Calculated	14.67%
10,000	Computers	Estimated	1.33%
800	Other	Remaining	0.11%
			100.00%
Natural Gas Use (Therms):		**Notes/Comments:**	
20,817	Total	Based on utility analysis	
19,152	Boilers	Therms/SF x Square Feet Served	0.920017294
1,665	DHW	Based on utility analysis	0.079982706
2,000	RTU	Based on utility analysis	0.096075323





Carteret Board of Education
CHA Project Number: 30201
Private Nicholas Minue School

ECM-1: Add Hot Water Coils to Airedales and Convert Classroom Wing to Hot Water

Description: This ECM evaluates the installation of a hot water heating coil to an existing Airedale classroom vertical unit ventilator, and shutting off the electric resistance heater. It is assumed that as the OA temperature drops to 27.5 degrees F and below, the heat pump shuts off and the electric heater is activated. It is assumed that no other modifications need to be made to the Aerdale unit. The purpose of the ECM is to replace electric resistance heating with hydronic heating.

Item	Value	Units	Formula/Comments
Electricity Rate	$ 0.13	/kWh	Blended rate
Natural Gas Rate	$ 1.27	therm	
FORMULA CONSTANTS			
Heating on temperature	58	degrees F	
Room setpoint temperature (occ. & unocc. hrs)	72	degrees F	
Number of Classrooms	15		per construction drawings
Average amount Supply Air per classroom	1400		per construction drawings
Average amount Outside Air per classroom	400	cfm	per construction drawings
Average Design BTUH heating per classroom	59,833	BTUH	assuming 0°F heating design temp. and 400 cfm OA
Average hot water flow per new coil	6.0		assuming 20°F delta T
Conversion	3,412	BTUH/kWh	
BTUH per therm			
Avg. wall, ceiling, & perimeter sq.ft. per classroom	910.0	sq. ft.	
Avg. BTUH loss per classroom per degree F	70.0	BTUH/sq.ft./°F	skin losses only, on average per classroom
HEATING - Existing Electric Resistance Heat / vs. Gas Fired Hydronic Heating per Classroom			
Existing Electric Heating COP	1.0		Electric resistance heat 27.5 degrees and below
Existing Heat Pump COP	3.0		Average heat pump performance between 57.5°F and 22.5°F
Existing Boiler performance	83.9%		Nameplate data
Heating Degree Days, 27.5°F and below	594	degrees F	from "http://www.degreedays.net/#generate for NYC area
Electric heat kWh total OA 27.5°F and below	2,068	kWh	annual per classroom
Electric heat kWh skin losses 27.5°F and below	804	kWh	annual per classroom
Total electric heat req'd 27.5°F and below	2,873	kWh	per classroom
Total BTUH 27.5°F and below	9,802,125	BTUH	per classroom
Heating NG (therms) total 27.5°F and below	117	therms	per classroom, adjusted for the efficiency of the boiler
PUMP RUN HOURS			
Pump hp	3.0	hp	Additional pump installed provides hot water circulation all
Run hours	636.3	hours	
Load factor	0.75		
Motor efficiency	92%		
Annual electricity consumption (pump)	1,161	kWh	an additional cost
SAVINGS			
kWh Energy Savings per classroom wing	43,093	kWh	
kWh Classroom wing savings minus pump kWh	41,932	kWh	savings
Additional Therms consumed per classroom wing	1,752	therms	an additional cost
Total Cost Savings	$ 3,252.38		per building

Savings calculation formulas are taken from NJ Protocols document for Electric HVAC Equipment

Avg OA Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Bin Hours (Occ. +	Heating BTUH Occupied Totals	Electric Resistance Heat kWh
97.5	35.4	6.0	2.5	3.5	0	0	0
92.5	37.4	31.0	12.9	18.1	0	0	0
87.5	35.0	131.0	54.6	76.4	0	0	0
82.5	33.0	500.0	208.3	291.7	0	0	0
77.5	31.5	620.0	258.3	361.7	0	0	0
72.5	29.9	664.0	276.7	387.3	0	0	0
67.5	27.2	854.0	355.8	498.2	0	0	0
62.5	24.0	927.0	386.3	540.8	0	0	0
57.5	20.3	600.0	250.0	350.0	8700	1,566,000	459
52.5	18.2	730.0	304.2	425.8	14235	2,562,300	751
47.5	16.0	491.0	204.6	286.4	12030	2,165,310	635
42.5	14.5	656.0	273.3	382.7	19352	3,483,360	1,021
37.5	12.5	1023.0	426.3	596.8	35294	6,352,830	1,862
32.5	10.5	734.0	305.8	428.2	28993	5,218,740	1,530
27.5	8.7	334.0	139.2	194.8	14863	2,675,340	784
22.5	7.0	252.0	105.0	147.0	12474	2,245,320	658
17.5	5.4	125.0	52.1	72.9	6813	1,226,250	359
12.5	3.7	47.0	19.6	27.4	2797	503,370	148
7.5	2.1	34.0	14.2	19.8	2193	394,740	116
2.5	1.3	1.0	0.4	0.6	70	12,510	4
TOTALS		8760	3650	5110		28406070	8325
			27.5 degrees F and below totals:		39209		2068.4

Carteret Board of Education
CHA Project Number: 30201
Carteret Middle School

ECM-1: Hot Water Coils Airedales - Cost

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
New 3.0 hp HW pump & assoc. piping & electric	1	EA	$ 4,775	$ 500		$ 4,904	$ 623		$ 5,527	RSMeans 2015
New hot water coil, 60,000 BTUH, 1400 cfm	15	EA	$ 1,150	$ 300		$ 17,716	$ 5,607	$ -	$ 23,323	RSMeans 2015
-- New ductwork / ductwork modifications	15	EA	$ 1,000	$ 3,000		$ 15,405	$ 56,070		$ 71,475	Engineering Estimate
-- Hot water piping, valves, and specialties	1	LS	$ 10,000	$ 10,000		$ 10,270	$ 12,460		$ 22,730	Engineering Estimate
-- Electrical - misc.	15	EA	$ 100	$ 200		$ 1,541	$ 3,738	$ -	$ 5,279	Engineering Estimate
-- Controls programming	15	EA	$ 1,000	$ 2,000		$ 15,405	$ 37,380	$ -	$ 52,785	Engineering Estimate
Shut of Aerdale electric heat	15	EA	$ 100	$ 500		$ 1,541	$ 9,345		$ 10,886	Engineering Estimate

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

$ 192,004	Subtotal
$ 67,201	35% Contingency
$ 259,200	**Total**

Carteret Board of Education
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Carteret Middle School

ECM-2: Install High Efficiency Motors & Variable Speed Drives

Description: This ECM evaluates the energy (electrical) savings associated with replacing existing 7.5 HP heating pumps motors with high efficiency motors (based on ASHRAE 2010 NEMA ratings) and adding variable frequency drives to control motor speed based on actual load verses constant volume / constant flow. Pumps operate in a lead/ lag fashion, therefore run hours are 50% for each pump.

Variable Inputs

Electric Rate	$0.13	**$/kWh**
Demand Rate	$8.04	**$/kW**

MOTOR SCHEDULE										Savings Factor		Existing Motor Energy		Proposed Motor Energy		Energy Savings	
Motor ID	Motor Type	Qty	HP	Total HP	Upgrade Motor	Load Factor	Existing Motor Eff.	New Motor Eff.	Annual Hours	Demand Savings Factor	Energy Savings Factor	Demand Energy (kW)	Electrical Energy (kWh)	Demand Energy (kW)	Electrical Energy (kWh)	Peak Demand Savings (kW)	Annual Energy Savings (kWh)
HWP-1,2	HW	1	7.5	7.5	N	0.75	91.7%	93.6%	2,213	0.216	0.240	4.6	10,125	1.0	8,928	3.6	1,198
															Total:	3.6	1,197.5
																$ 348	$ 152
																	$ 500

Savings calculation formulas are taken from NJ Protocols document for VFDs

Carteret Board of Education
CHA Project Number: 30201
Carteret Middle School

ECM-2: Install Variable Speed Drives - 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.		
						$ -	$ -	$ -	$ -	
VFDs for Hot Water Pumps	2	ea	$ 2,100	$ 525		$ 4,313	$ 1,308	$ -	$ 5,622	RS Means 2012
Motors -7.5 HP	2	ea	$ 550	$ 100		$ 1,130	$ 249	$ -	$ 1,379	RS Means 2012
Electrical - misc.	2	ls	$ 250	$ 500		$ 514	$ 1,246	$ -	$ 1,760	RS Means 2012
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

$ 8,760	Subtotal
$ 3,066	35% Contingency
$ 11,826	**Total**

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

Carteret Board of Education
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Carteret Middle School

ECM-3: Retro-Commission DDC Controls

Summary: The existing controls system consists of a Siemens DDC system that is multi-functional but is not programmed to operate at full capacity. This ECM reviews re-programming and retro-commissioning the existing system in order to better benefit from its energy-saving capabilities .

Building Information:

78,595 Sq Footage

$0.15 $/kWh Blended
$1.26 $/Therm

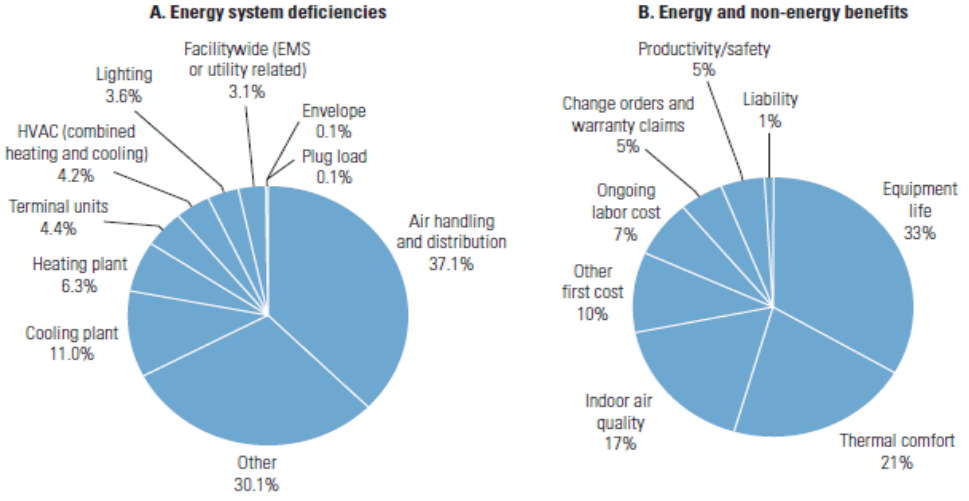
EXISTING CONDITIONS		
Existing Facility Total Electric usage	749,800	kWh
Existing Facility Total Gas usage	20,817	Therms
Existing Facility Cooling Electric usage	367,402	kWh[1]
Existing Facility Heating Natural Gas usage	19359.81	Therms[2]
PROPOSED CONDITIONS		
Proposed Facility Cooling Electric Savings	18,370	kWh
Proposed Facility Natural Gas Savings	967.9905	Therms
SAVINGS		
Retro-Commissioning Electric Savings	18,370	**kWh**
Retro-Commissioning Natural Gas Savings	968	**Therms**
Total cost savings	$ 4,025	

Assumptions

1 49% of facility total electricity dedicated to Cooling based on Building Utility Analysis
2 93% of facility total natural gas dedicated to Heating based on Building Utility Analysis
3 5% Typical Savings associated with Retro-Commissioning of controls based on EPA Energy Star Report (CH 5 - Retrocommissioning)

Figure 5.2: Retrocommissioning results

Building energy system deficiencies: A recent study of retrocommissioning revealed a wide variety of problems—those related to the overall HVAC system were the most common type (A). Energy and non-energy benefits: Retrocommissioning provided both energy and non-energy benefits—the most common of these, noted in one-third of the buildings surveyed, was the extension of equipment life (B).



Note: EMS = energy management system.

Courtesy: E SOURCE; data from Lawrence Berkeley National Laboratory, Portland Energy Conservation Inc., and Energy Systems Laboratory, Texas A&M University

Carteret Board of Education
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Carteret Middle School

ECM-3: Retro-Commission DDC Controls - 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.		
									$ -	
Retro-Commission Controls and Sensors	78595	SF	$ 0.27	INC	INC	$ 21,794	INC	INC	$21,794	EPA Estimate
Upgrade to remote access and password protection	78595	SF	$ 0.05	INC	INC	$ 4,036	INC	INC	$ 4,036	Engineering Estimate
						$ -	$ -	$ -	$ -	

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

$25,829	Subtotal
$ 9,040	35% Contingency
$34,870	**Total**

Carteret Board of Education
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Carteret Middle School

ECM-4: Replace Gas-Fired DHW Heaters w/ Tankless Condensing Gas-Fired DHW Heaters

Description: This ECM evaluates the energy savings associated with replacing a gas fired tank type water heater with an equivalent capacity instantaneous water heater.

Item	Value	Units	Formula/Comments
Avg. Monthly Utility Demand by Water Heater	**420**	Therms/month	Calculated from utility bill
Total Annual Utility Demand by Water Heater	504,000	MBTU/yr	1therm = 100 MBTU
Existing DHW Heater Efficiency	78%		Per manufacturer nameplate
Total Annual Hot Water Demand (w/ standby losses)	393,120	MBTU/yr	
Existing Tank Size	80	Gallons	Per manufacturer nameplate
Hot Water Piping System Capacity	5	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	140	˚F	Per building personnel
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)	1.2	MBH	
Annual Standby Hot Water Load	10,549	MBTU/yr	
New Tank Size	0	Gallons	Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Hot Water Piping System Capacity	5	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	140	˚F	
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)	0.1	MBH	
Annual Standby Hot Water Load	621	MBTU/yr	
Total Annual Hot Water Demand	383,192	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Proposed Fuel Use	3,992	Therns	Standby Losses and inefficient DHW heater eliminated
Utility Cost	$1.26	$/Therm	
Existing Operating Cost of DHW	$6,325	$/yr	
Proposed Operating Cost of DHW	$5,009	$/yr	

Savings Summary:

Utility	Energy Savings	Cost Savings
Therms/yr	1,048	$1,316

Carteret Board of Education
CHA Project Number: 30201
Carteret Middle School

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-4: Replace N.G. Water Heaters with Condensing DHW Heaters - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
DHW Heater Removal	2	LS		$ 250		$ -	$ 623	$ -	$ 623	RS Means 2012
High Efficiency Gas-Fired DHW Heater	2	EA	$ 4,000	$ 280		$ 8,216	$ 698	$ -	$ 8,914	RS Means 2012
Miscellaneous Electrical	2	LS	$ 300			$ 616	$ -	$ -	$ 616	RS Means 2012
Venting Kit	2	EA	$ 450	$ 650		$ 924	$ 1,620	$ -	$ 2,544	RS Means 2012
Miscellaneous Piping and Valves	2	LS	$ 200			$ 411	$ -	$ -	$ 411	RS Means 2012

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

$ 13,108		Subtotal
$ 4,588	35%	Contingency
$ 17,696		**Total**

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ECM-5: Replace RTU Equipment with High Efficient RTU Equipment

Description: This ECM evaluates the energy savings associated with replacing the two Lennox units and a Reznor unit with newer, more efficient heating and cooling equipment having the same capacity.

Equipment Tag	Equipment Description	General Type	Cooling Capacity (Btu/h)	Heating Capacity (Btu/h)
	RTU-1	HVAC	180,000	150,000
	RTU-2	HVAC	180,000	150,000
	RTU-3	HVAC	72,000	80,000

Item	Value	Units	Formula/Comments
Demand Rate	$ 8.04	/ kW	
Electricity Rate	$ 0.127	/kWh	Consumption rate
FORMULA CONSTANTS			
Coincidence Factor	0.67		
Conversion	3.412	btu/kW	
COOLING - HVAC			
Cooling Capacity	432,000	btu/hr	
Baseline EER	9.0	EER	
Proposed EER	14.0	EER	
Equivalent Full Load Hours	1,478	hrs	
Demand Savings	11.49	kW	
Energy Savings	25,343	kWh	
HEATING - HVAC			
Heating Capacity	380,000	btu/h	
Baseline Heating Efficiency	0.8		See Table Below
Proposed Heating Efficiency	0.8		Equipment
Equivalent Full Load Hours	931	hrs	
SAVINGS			
Demand Savings	11.49	kW	
Energy Savings	25,343	kWh	
Cost Savings	$ 4,327		

Carteret Board of Education
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Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-5: Replace RTU Equipment with High Efficient RTU Equipment - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Existing (3) RTU demolition	3	LS	$ -	$ 500	$ -	$ -	$ 1,869	$ -	$ 1,869	
(2) RTUs, 15 ton packaged units	2	EA	$ 14,500	$ 5,000		$ 29,783	$ 12,460	$ -	$ 42,243	
(1) RTU, 6 ton packaged unit	1	EA	$ 14,000	$ 5,000		$ 14,378	$ 6,230	$ -	$ 20,608	
Ductwork & insulation	125	LF	$ 50	$ 30		$ 6,419	$ 4,673	$ -	$ 11,091	
Gas piping	3	EA	$ 250	$ 250		$ 770	$ 935	$ -	$ 1,705	
Electrical - misc.	3	EA	$ 250	$ 250		$ 770	$ 935	$ -	$ 1,705	

Cost estimates are for calculation purposes only-- do not use for procurement.
Cost Estimates Do not Include Asbestos Abatement

$ 79,221	Subtotal
$ 27,727	35% Contingency
$ 106,900	**Total**

Carteret Board of Education
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Carteret Middle School

ECM-6: Window A/C Controller

EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (btu/h)
Window AC units		24,000

Quantity: *17* *Total btu/h of all window A/C Units:* *408,000* *btu/h*

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

ASSUMPTIONS			Comments
Electric Cost	$0.153	/ kWh	
Average run hours per Week	80	Hours	
Space Balance Point	55	F	
Space Temperature Setpoint	65	deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	408,000	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	11.0		
Existing Annual Electric Usage	49,561	kWh	

Item	Value	Units	Comments
Proposed Annual Electric Usage	20,700	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Electrical Usage Savings	28,860	kWh
Annual Cost Savings	$4,416	
Total Project Cost	$3,500	
Simple Payback	1	years

OAT - DB Bin Temp F	Annual Hours	**Existing Hours of Operation**	Proposed % of time of operation	**Proposed hrs of Operation**
102.5	0	0	100%	0
97.5	6	3	89%	3
92.5	31	15	79%	12
87.5	131	62	68%	43
82.5	500	238	58%	138
77.5	620	295	47%	140
72.5	664	316	37%	116
67.5	854	407	26%	107
62.5	927	0	0%	0
57.5	600	0	0%	0
52.5	730	0	0%	0
47.5	491	0	0%	0
42.5	656	0	0%	0
37.5	1,023	0	0%	0
32.5	734	0	0%	0
27.5	334	0	0%	0
22.5	252	0	0%	0
17.5	125	0	0%	0
12.5	47	0	0%	0
7.5	34	0	0%	0
2.5	1	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0

Total	8,760	**1,336**	42%	**558**

Carteret Board of Education
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ECM-6: Window A/C Controller - 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.		
Window AC Controller	17	EA	$ 150	$ -	$ -	2618.85	$ -	$ -	$ 2,619	Estimated

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

$ 2,619	Subtotal
$ 917	35% Contingency
$ 3,500	**Total**

Carteret Board of Education
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Carteret Middle 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)	78,595
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)	$114,725	$26,128
Existing Usage (from utility)	749,800	20,817
Proposed Savings	206,823	2,016
Existing Total MMBtus	4,641	
Proposed Savings MMBtus	908	
% Energy Reduction	**19.6%**	
Proposed Annual Savings	$34,800	

	Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm	$/kWh	$/therm
Incentive #2	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.11	$1.13
Incentive #3	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.11	$1.13

	Incentives $		
	Elec	Gas	Total
			$5,000
Incentive #1	$0	$0	$5,000
Incentive #2	$22,751	$2,274	$25,025
Incentive #3	$22,751	$2,274	$25,025
Total All Incentives	**$45,501**	**$4,548**	**$55,049**

Total Project Cost	$528,455

		Allowable Incentive
% Incentives #1 of Utility Cost*	3.5%	$5,000
% Incentives #2 of Project Cost**	4.7%	$25,025
% Incentives #3 of Project Cost**	4.7%	$25,025
Total Eligible Incentives***	**$55,049**	
Project Cost w/ Incentives	$473,405	

Project Payback (years)	
w/o Incentives	w/ Incentives
15.2	13.6

* 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 Carteret Middle School
CHA Project No. 30201

ECM-L1 Lighting Replacements

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$331,523	**34.4**	**114,933**	**0**	**$17,915**	**0**	**$17,915**	**$20,955**	**18.5**	**17.3**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-L2 Install Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$22,140	**0.0**	**30,302**	**0**	**$3,848**	**0**	**$3,848**	**$1,640**	**5.8**	**5.3**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-L3 Lighting Replacements with Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$353,663	**34.4**	**133,052**	**0**	**$20,216**	**0**	**$20,216**	**$22,595**	**17.5**	**16.4**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Energy Audit of Carteret Middle School
CHA Project No. 30201
Existing Lighting & Audit Input

Cost of Electricity: **$0.127** **$/kWh**
$8.04 **$/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	
40LED	Main Entrance	Hallways	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	4032	968	C-OCC	
35LED	Media Center	Library	38	T 32 R F 3 (ELE)	F43ILL/2	90	3.42	SW	2688	9,193	C-OCC	
35LED	Child Study	Offices	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	3024	1,089	C-OCC	
35LED	Office	Offices	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	3024	272	C-OCC	
35LED	Office	Offices	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	3024	1,089	C-OCC	
40LED	Office	Offices	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3024	363	C-OCC	
35LED	122	Offices	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	3024	544	C-OCC	
40LED	Hallway	Hallways	7	T 32 R F 2 (ELE)	F42LL	60	0.42	SW	4032	1,693	C-OCC	
35LED	135	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
35LED	133	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
35LED	131	Offices	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	3024	544	C-OCC	
35LED	Storage	Storage Areas	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2016	181	C-OCC	
32LED	Electric Room	Mechanical Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	8736	1,048	C-OCC	
35LED	129	Classrooms	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.44	C-OCC	3360	4,838	NONE	
35LED	127	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
32LED	Girls Room	Restroom	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2688	323	C-OCC	
32LED	Boys Room	Restroom	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2688	323	C-OCC	
32LED	Janitor	Storage Areas	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	2016	121	C-OCC	
32LED	Hallway	Hallways	15	1T 32 R F 2 (ELE)	F42LL	60	0.90	SW	4032	3,629	C-OCC	
32LED	105	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	103	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	101	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	102	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	104	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	106	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	Boiler Room	Mechanical Room	5	1T 32 R F 2 (ELE)	F42LL	60	0.30	SW	8736	2,621	C-OCC	
32LED	107	Classrooms	15	1T 32 R F 2 (ELE)	F42LL	60	0.90	SW	3360	3,024	C-OCC	
40LED	107	Classrooms	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3360	806	C-OCC	
32LED	Copy Room	Offices	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	3024	544	C-OCC	
185LED	Old Office	Offices	4	T 40 R F 4 (ELE)	F44SE	172	0.69	SW	3024	2,081	C-OCC	
35LED	124 Nurse Office	Offices	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	3024	1,633	C-OCC	
33	124 Nurse Office	Offices	1	13 W CF 1	CFQ13/1-L	15	0.02	SW	3024	45	C-OCC	
35LED	124 Nurse Office	Offices	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	3024	272	C-OCC	
40LED	Principle Office	Offices	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	3024	726	C-OCC	
71	Principle Office	Offices	1	I 60	I60/1	60	0.06	SW	3024	181	C-OCC	
35LED	Main Office	Offices	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	SW	3024	2,449	C-OCC	
40LED	Hallway	Hallways	6	T 32 R F 2 (ELE)	F42LL	60	0.36	SW	4032	1,452	C-OCC	
40LED	I.S.S Office	Offices	6	T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3024	1,089	C-OCC	
40LED	I.S.S Office	Offices	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3024	363	C-OCC	
40LED	I.S.S Office	Offices	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3024	363	C-OCC	
40LED	I.S.S Office	Offices	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3024	363	C-OCC	
40LED	Hallway	Hallways	9	T 32 R F 2 (ELE)	F42LL	60	0.54	SW	4032	2,177	C-OCC	
40LED	Hallway	Hallways	3	T 32 R F 2 (ELE)	F42LL	60	0.18	SW	4032	726	C-OCC	
40LED	Hallway	Hallways	10	T 32 R F 2 (ELE)	F42LL	60	0.60	SW	4032	2,419	C-OCC	
40LED	128	Classrooms	6	T 32 R F 2 (ELE)	F42LL	60	0.36	C-OCC	3360	1,210	NONE	
40LED	130	Classrooms	5	T 32 R F 2 (ELE)	F42LL	60	0.30	C-OCC	3360	1,008	NONE	
32LED	Girls Room	Restroom	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2688	323	C-OCC	
32LED	Boys Room	Restroom	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2688	323	C-OCC	
35LED	Multipurpose Room	Cafeteria	50	T 32 R F 3 (ELE)	F43ILL/2	90	4.50	SW	2688	12,096	C-OCC	
40LED	Kitchen	Kitchen	10	T 32 R F 2 (ELE)	F42LL	60	0.60	SW	2688	1,613	C-OCC	
40LED	Storage	Storage Areas	2	T 32 R F 2 (ELE)	F42LL	60	0.12	C-OCC	2016	242	NONE	
251	Gym	Gymnasium	30	T 54 W F 5 (ELE) (T-5)	F45GHL	294	8.82	SW	2688	23,708	C-OCC	
32LED	Girls Locker	Locker	8	1T 32 R F 2 (ELE)	F42LL	60	0.48	SW	2688	1,290	C-OCC	
32LED	Boys Locker	Locker	9	1T 32 R F 2 (ELE)	F42LL	60	0.54	SW	2688	1,452	C-OCC	
32LED	Coach Room 1	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3024	363	C-OCC	
40LED	Coach Room 1	Offices	1	T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3024	181	C-OCC	
32LED	Coach Room 2	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3024	363	C-OCC	
32LED	Room Next to Locker	Storage Areas	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	2016	363	C-OCC	
32LED	Teacher Room	Offices	10	1T 32 R F 2 (ELE)	F42LL	60	0.60	SW	3024	1,814	C-OCC	
32LED	Bath Room	Restroom	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2688	323	C-OCC	
32LED	Office	Offices	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	3024	363	C-OCC	
185LED	111	Classrooms	14	T 40 R F 4 (ELE)	F44SE	172	2.41	SW	3360	8,091	C-OCC	
35LED	115	Classrooms	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.54	SW	3360	1,814	C-OCC	
5LED	Hallway	Hallways	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	4032	968	C-OCC	
32LED	Boiler Room 2	Mechanical Room	4	1T 32 R F 2 (ELE)	F42LL	60	0.24	SW	8736	2,097	C-OCC	
32LED	108	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	
32LED	110	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	
32LED	112	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	
32LED	114	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	
32LED	116	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	
32LED	118	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	
32LED	117	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	C-OCC	3360	4,234	NONE	
32LED	119	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	C-OCC	3360	4,234	NONE	
32LED	121	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	
32LED	123	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	

Energy Audit of Carteret Middle School
CHA Project No. 30201
Existing Lighting & Audit Input

Cost of Electricity: **$0.127** **$/kWh**
$8.04 **$/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	
32LED	125	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	C-OCC	3360	3,629	NONE	
5LED	Hallway	Hallways	13	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.78	SW	4032	3,145	C-OCC	
32LED	201	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	203	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	205	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
33	Hallway	Hallways	4	13 W CF 1	CFQ13/1-L	15	0.06	SW	4032	242	C-OCC	
35LED	Hallway	Hallways	14	T 32 R F 3 (ELE)	F43ILL/2	90	1.26	SW	4032	5,080	C-OCC	
32LED	202	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	204	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
32LED	206B	Classrooms	6	1T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3360	1,210	C-OCC	
32LED	206A	Classrooms	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	SW	3360	3,629	C-OCC	
32LED	208A	Classrooms	8	1T 32 R F 2 (ELE)	F42LL	60	0.48	SW	3360	1,613	C-OCC	
32LED	208B	Classrooms	24	1T 32 R F 2 (ELE)	F42LL	60	1.44	SW	3360	4,838	C-OCC	
32LED	209	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	3360	4,234	C-OCC	
40LED	207	Classrooms	16	T 32 R F 2 (ELE)	F42LL	60	0.96	SW	3360	3,226	C-OCC	
40LED	Stairwell	Hallways	1	T 32 R F 2 (ELE)	F42LL	60	0.06	SW	4032	242	C-OCC	
35LED	211	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
35LED	213	Classrooms	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.44	C-OCC	3360	4,838	NONE	
40LED	Hallway	Hallways	6	T 32 R F 2 (ELE)	F42LL	60	0.36	SW	4032	1,452	C-OCC	
32LED	Electric Room	Mechanical Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	8736	1,048	C-OCC	
32LED	Faculty	Offices	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	3024	181	C-OCC	
35LED	212	Classrooms	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	3360	1,210	C-OCC	
35LED	210 VP Office	Offices	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	SW	3024	544	C-OCC	
32LED	Girls Room	Restroom	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2688	323	C-OCC	
32LED	Boys Room	Restroom	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	2688	323	C-OCC	
35LED	215	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
35LED	217	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
35LED	214	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
35LED	216	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
35LED	218	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
35LED	220	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	C-OCC	3360	3,629	NONE	
40LED	Hallway	Hallways	1	T 32 R F 2 (ELE)	F42LL	60	0.06	SW	4032	242	C-OCC	
40LED	Hallway	Hallways	7	T 32 R F 2 (ELE)	F42LL	60	0.42	SW	4032	1,693	C-OCC	
142LED	Outside Wallpack Light	Outdoor Lighting	16	MH 100	MH100/1	128	2.05	Breaker	4032	8,258	NONE	
	Total		**1,109**				**85.32**			**281,109**		

Energy Audit of Carteret Middle School
CHA Project No. 30201
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	Main Entrance	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	4032	968	4	T 38 R LED	RTLED38	38	0.2	SW	4,032	613	355	0.1	$ 53.55	$ 945.00	$100	17.6	15.8
35LED	Media Center	38	T 32 R F 3 (ELE)	F43ILL/2	90	3.4	SW	2688	9,193	38	T 59 R LED	RTLED38	38	1.4	SW	2,688	3,881	5,311	2.0	$ 865.20	$ 8,977.50	$950	10.4	9.3
35LED	Child Study	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3024	1,089	4	T 59 R LED	RTLED38	38	0.2	SW	3,024	460	629	0.2	$ 99.95	$ 945.00	$100	9.5	8.5
35LED	Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3024	272	1	T 59 R LED	RTLED38	38	0.0	SW	3,024	115	157	0.1	$ 24.99	$ 236.25	$25	9.5	8.5
35LED	Office	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3024	1,089	4	T 59 R LED	RTLED38	38	0.2	SW	3,024	460	629	0.2	$ 99.95	$ 945.00	$100	9.5	8.5
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	T 38 R LED	RTLED38	38	0.1	SW	3,024	230	133	0.0	$ 21.14	$ 472.50	$50	22.3	20.0
35LED	122	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544	2	T 59 R LED	RTLED38	38	0.1	SW	3,024	230	314	0.1	$ 49.97	$ 472.50	$50	9.5	8.5
40LED	Hallway	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,693	7	T 38 R LED	RTLED38	38	0.3	SW	4,032	1,073	621	0.2	$ 93.72	$ 1,653.75	$175	17.6	15.8
35LED	135	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
35LED	133	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
35LED	131	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544	2	T 59 R LED	RTLED38	38	0.1	SW	3,024	230	314	0.1	$ 49.97	$ 472.50	$50	9.5	8.5
35LED	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2016	181	1	T 59 R LED	RTLED38	38	0.0	SW	2,016	77	105	0.1	$ 18.33	$ 236.25	$25	12.9	11.5
32LED	Electric Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	8736	1,048	2	STLED4	STLED4	40	0.1	SW	8,736	699	349	0.0	$ 48.24	$ 713.40	$30	14.8	14.2
35LED	129	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	3360	4,838	16	T 59 R LED	RTLED38	38	0.6	C-OCC	3,360	2,043	2,796	0.8	$ 435.30	$ 3,780.00	$400	8.7	7.8
35LED	127	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	SW	2,688	215	108	0.0	$ 17.51	$ 713.40	$30	40.7	39.0
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	SW	2,688	215	108	0.0	$ 17.51	$ 713.40	$30	40.7	39.0
32LED	Janitor	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2016	121	1	STLED4	STLED4	40	0.0	SW	2,016	81	40	0.0	$ 7.05	$ 356.70	$15	50.6	48.5
32LED	Hallway	15	1T 32 R F 2 (ELE)	F42LL	60	0.9	SW	4032	3,629	15	STLED4	STLED4	40	0.6	SW	4,032	2,419	1,210	0.3	$ 182.56	$ 5,350.50	$225	29.3	28.1
32LED	105	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	103	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	101	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	102	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	104	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	106	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	Boiler Room	5	1T 32 R F 2 (ELE)	F42LL	60	0.3	SW	8736	2,621	5	STLED4	STLED4	40	0.2	SW	8,736	1,747	874	0.1	$ 120.60	$ 1,783.50	$75	14.8	14.2
32LED	107	15	1T 32 R F 2 (ELE)	F42LL	60	0.9	SW	3360	3,024	15	STLED4	STLED4	40	0.6	SW	3,360	2,016	1,008	0.3	$ 156.96	$ 5,350.50	$225	34.1	32.7
40LED	107	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3360	806	4	T 38 R LED	RTLED38	38	0.2	SW	3,360	511	296	0.1	$ 46.04	$ 945.00	$100	20.5	18.4
32LED	Copy Room	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3024	544	3	STLED4	STLED4	40	0.1	SW	3,024	363	181	0.1	$ 28.83	$ 1,070.10	$45	37.1	35.6
185LED	Old Office	4	T 40 R F 4 (ELE)	F44SE	172	0.7	SW	3024	2,081	4	T 50 R LED	RTLED50	50	0.2	SW	3,024	605	1,476	0.5	$ 234.50	$ 945.00	$100	4.0	3.6
35LED	124 Nurse Office	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	3024	1,633	6	T 59 R LED	RTLED38	38	0.2	SW	3,024	689	943	0.3	$ 149.92	$ 1,417.50	$150	9.5	8.5
33	124 Nurse Office	1	13 W CF 1	CFQ13/1-L	15	0.0	SW	3024	45	1	13 W CF 1	CFQ13/1-L	15	0.0	SW	3,024	45	-	0.0	$ -	$ -	$0		#DIV/0!
35LED	124 Nurse Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3024	272	1	T 59 R LED	RTLED38	38	0.0	SW	3,024	115	157	0.1	$ 24.99	$ 236.25	$25	9.5	8.5
40LED	Principle Office	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3024	726	4	T 38 R LED	RTLED38	38	0.2	SW	3,024	460	266	0.1	$ 42.29	$ 945.00	$100	22.3	20.0
71	Principle Office	1	I 60	I60/1	60	0.1	SW	3024	181	1	CF 26	CFQ26/1-L	27	0.0	SW	3,024	82	100	0.0	$ 15.86	$ 6.75	$0	0.4	0.4
35LED	Main Office	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	3024	2,449	9	T 59 R LED	RTLED38	38	0.3	SW	3,024	1,034	1,415	0.5	$ 224.89	$ 2,126.25	$225	9.5	8.5
40LED	Hallway	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,452	6	T 38 R LED	RTLED38	38	0.2	SW	4,032	919	532	0.1	$ 80.33	$ 1,417.50	$150	17.6	15.8
40LED	I.S.S Office	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3024	1,089	6	T 38 R LED	RTLED38	38	0.2	SW	3,024	689	399	0.1	$ 63.43	$ 1,417.50	$150	22.3	20.0
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	T 38 R LED	RTLED38	38	0.1	SW	3,024	230	133	0.0	$ 21.14	$ 472.50	$50	22.3	20.0
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	T 38 R LED	RTLED38	38	0.1	SW	3,024	230	133	0.0	$ 21.14	$ 472.50	$50	22.3	20.0
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	T 38 R LED	RTLED38	38	0.1	SW	3,024	230	133	0.0	$ 21.14	$ 472.50	$50	22.3	20.0
40LED	Hallway	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	4032	2,177	9	T 38 R LED	RTLED38	38	0.3	SW	4,032	1,379	798	0.2	$ 120.49	$ 2,126.25	$225	17.6	15.8
40LED	Hallway	3	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	4032	726	3	T 38 R LED	RTLED38	38	0.1	SW	4,032	460	266	0.1	$ 40.16	$ 708.75	$75	17.6	15.8
40LED	Hallway	10	T 32 R F 2 (ELE)	F42LL	60	0.6	SW	4032	2,419	10	T 38 R LED	RTLED38	38	0.4	SW	4,032	1,532	887	0.2	$ 133.88	$ 2,362.50	$250	17.6	15.8
40LED	128	6	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	3360	1,210	6	T 38 R LED	RTLED38	38	0.2	C-OCC	3,360	766	444	0.1	$ 69.06	$ 1,417.50	$150	20.5	18.4
40LED	130	5	T 32 R F 2 (ELE)	F42LL	60	0.3	C-OCC	3360	1,008	5	T 38 R LED	RTLED38	38	0.2	C-OCC	3,360	638	370	0.1	$ 57.55	$ 1,181.25	$125	20.5	18.4
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	SW	2,688	215	108	0.0	$ 17.51	$ 713.40	$30	40.7	39.0
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	SW	2,688	215	108	0.0	$ 17.51	$ 713.40	$30	40.7	39.0
35LED	Multipurpose Room	50	T 32 R F 3 (ELE)	F43ILL/2	90	4.5	SW	2688	12,096	50	T 59 R LED	RTLED38	38	1.9	SW	2,688	5,107	6,989	2.6	$ 1,138.43	$ 11,812.50	$1,250	10.4	9.3
40LED	Kitchen	10	T 32 R F 2 (ELE)	F42LL	60	0.6	SW	2688	1,613	10	T 38 R LED	RTLED38	38	0.4	SW	2,688	1,021	591	0.2	$ 96.33	$ 2,362.50	$250	24.5	21.9
40LED	Storage	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2016	242	2	T 38 R LED	RTLED38	38	0.1	C-OCC	2,016	153	89	0.0	$ 15.51	$ 472.50	$50	30.5	27.2
251	Gym	30	T 54 W F 5 (ELE) (T-5)	F45GHL	294	8.8	SW	2688	23,708	30	T 54 W F 5 (ELE) (T-5)	F45GHL	294	8.8	SW	2,688	23,708	-	0.0	$ -	$ -	$0		#DIV/0!
32LED	Girls Locker	8	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2688	1,290	8	STLED4	STLED4	40	0.3	SW	2,688	860	430	0.2	$ 70.06	$ 2,853.60	$120	40.7	39.0
32LED	Boys Locker	9	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2688	1,452	9	STLED4	STLED4	40	0.4	SW	2,688	968	484	0.2	$ 78.81	$ 3,210.30	$135	40.7	39.0
32LED	Coach Room 1	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	STLED4	STLED4	40	0.1	SW	3,024	242	121	0.0	$ 19.22	$ 713.40	$30	37.1	35.6
40LED	Coach Room 1	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	181	1	T 38 R LED	RTLED38	38	0.0	SW	3,024	115	67	0.0	$ 10.57	$ 236.25	$25	22.3	20.0
32LED	Coach Room 2	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	STLED4	STLED4	40	0.1	SW	3,024	242	121	0.0	$ 19.22	$ 713.40	$30	37.1	35.6
32LED	Room Next to Locker	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2016	363	3	STLED4	STLED4	40	0.1	SW	2,016	242	121	0.1	$ 21.15	$ 1,070.10	$45	50.6	48.5
32LED	Teacher Room	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	3024	1,814	10	STLED4	STLED4	40	0.4	SW	3,024	1,210	605	0.2	$ 96.11	$ 3,567.00	$150	37.1	35.6
32LED	Bath Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	SW	2,688	215	108	0.0	$ 17.51	$ 713.40	$30	40.7	39.0
32LED	Office	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	STLED4	STLED4	40	0.1	SW	3,024	242	121	0.0	$ 19.22	$ 713.40	$30	37.1	35.6
185LED	111	14	T 40 R F 4 (ELE)	F44SE	172	2.4	SW	3360	8,091	14	T 50 R LED	RTLED50	50	0.7	SW	3,360	2,352	5,739	1.7	$ 893.63	$ 3,307.50	$350	3.7	3.3
35LED	115	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	3360	1,814	6	T 59 R LED	RTLED38	38	0.2	SW	3,360	766	1,048	0.3	$ 163.24	$ 1,417.50	$150	8.7	7.8
5LED	Hallway	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	4032	968	4	2T 25 R LED	2RTLED	25	0.1	SW	4,032	403	564	0.1	$ 85.20	$ 810.00	$60	9.5	8.8
32LED	Boiler Room 2	4	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	8736	2,097	4	STLED4	STLED4	40	0.2	SW	8,736	1,398	699	0.1	$ 96.48	$ 1,426.80	$60	14.8	14.2
32LED	108	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	110	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	112	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	114	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	116	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	118	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	117	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	119	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	121	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	123	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	125	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
5LED	Hallway	13	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.8	SW	4032	3,145	13	2T 25 R LED	2RTLED	25	0.3	SW	4,032	1,310	1,835	0.5	$ 276.89	$ 2,632.50	$195	9.5	8.8
32LED	201	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	203	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	205	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
33	Hallway	4	13 W CF 1	CFQ13/1-L	15	0.1	SW	4032	242	4	13 W CF 1	CFQ13/1-L	15	0.1	SW	4,032	242	-	0.0	$ -	$ -	$0		#DIV/0!
35LED	Hallway	14	T 32 R F 3 (ELE)	F43ILL/2	90	1.3	SW	4032	5,080	14	T 59 R LED	RTLED38	38	0.5	SW	4,032	2,145	2,935	0.7	$ 443.02	$ 3,307.50	$350	7.5	6.7
32LED	202	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	204	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
32LED	206B	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,210	6	STLED4	STLED4	40	0.2	SW	3,360	806	403	0.1	$ 62.78	$ 2,140.20	$90	34.1	32.7
32LED	206A	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	SW	3360	3,629	18	STLED4	STLED4	40	0.7	SW	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$270	34.1	32.7
32LED	208A	8	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	3360	1,613	8	STLED4	STLED4	40	0.3	SW	3,360	1,075	538	0.2	$ 83.71	$ 2,853.60	$120	34.1	32.7
32LED	208B	24	1T 32 R F 2 (ELE)	F42LL	60	1.4	SW	3360	4,838	24	STLED4	STLED4	40	1.0	SW	3,360	3,226	1,613	0.5	$ 251.14	$ 8,560.80	$360	34.1	32.7
32LED	209	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	SW	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$315	34.1	32.7
40LED	207	16	T 32 R F 2 (ELE)	F42LL	60	1.0	SW	3360	3,226	16	T 38 R LED	RTLED38	38	0.6	SW	3,360	2,043	1,183	0.4	$ 184.17	$ 3,780.00	$400	20.5	18.4
40LED	Stairwell	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4032	242	1	T 38 R LED	RTLED38	38	0.0	SW	4,032	153	89	0.0	$ 13.39	$ 236.25	$25	17.6	15.8
35LED	211	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
35LED	213	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	3360	4,838	16	T 59 R LED	RTLED38	38	0.6	C-OCC	3,360	2,043	2,796	0.8	$ 435.30	$ 3,780.00	$400	8.7	7.8
40LED	Hallway	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,452	6	T 38 R LED	RTLED38	38	0.2	SW	4,032	919	532	0.1	$ 80.33	$ 1,417.50	$150	17.6	15.8
32LED	Electric Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	8736	1,048	2	STLED4	STLED4	40	0.1	SW	8,736	699	349	0.0	$ 48.24	$ 713.40	$30	14.8	14.2
32LED	Faculty	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	181	1	STLED4	STLED4	40	0.0	SW	3,024	121	60	0.0	$ 9.61	$ 356.70	$15	37.1	35.6
35LED	212	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3360	1,210	4	T 59 R LED	RTLED38	38	0.2	SW	3,360	511	699	0.2	$ 108.83	$ 945.00	$100	8.7	7.8
35LED	210 VP Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544	2	T 59 R LED	RTLED38	38	0.1	SW	3,024	230	314	0.1	$ 49.97	$ 472.50	$50	9.5	8.5
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	SW	2,688	215	108	0.0	$ 17.51	$ 713.40	$30	40.7	39.0
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	SW	2,688	215	108	0.0	$ 17.51	$ 713.40	$30	40.7	39.0
35LED	215	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
35LED	217	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
35LED	214	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
35LED	216	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
35LED	218	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
35LED	220	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	C-OCC	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$300	8.7	7.8
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4032	242	1	T 38 R LED	RTLED38	38	0.0	SW	4,032	153	89	0.0	$ 13.39	$ 236.25	$25	17.6	15.8
40LED	Hallway	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,693	7	T 38 R LED	RTLED38	38	0.3	SW	4,032	1,073	621	0.2	$ 93.72	$ 1,653.75	$175	17.6	15.8
142LED	Outside Wallpack Light	16	MH 100	MH100/1	128	2.0	Breaker	4032	8,258	16	FXLED39	FXLED39/1	39	0.6	Breaker	4,032	2,516	5,742	1.4	$ 866.57	$ 8,899.20	$800	10.3	9.3
	Total	1,109				85.3			281,109	1,109			4,440	50.9			166,176	114,933	34.4	$17,915	$331,523	$20,955		
																	Demand Savings			34.4	$3,318			
																	kWh Savings			114,933	$14,597			
																	Total savings				$17,915		18.5	17.3

Energy Audit of Carteret Middle School
CHA Project No. 30201
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	Main Entrance	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	4032	967.7	4	T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	4032	967.7	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
35LED	Media Center	38	T 32 R F 3 (ELE)	F43ILL/2	90	3.4	SW	2688	9,193.0	38	T 32 R F 3 (ELE)	F43ILL/2	90	3.4	C-OCC	2688	9,193.0	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
35LED	Child Study	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3024	1,088.6	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	C-OCC	2116.8	762.0	326.6	0.0	$41.48	$270.00	$20.00	6.5	6.0
35LED	Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3024	272.2	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	2116.8	190.5	81.6	0.0	$10.37	$270.00	$20.00	26.0	24.1
35LED	Office	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3024	1,088.6	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	C-OCC	2116.8	762.0	326.6	0.0	$41.48	$270.00	$20.00	6.5	6.0
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	362.9	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	254.0	108.9	0.0	$13.83	$270.00	$20.00	19.5	18.1
35LED	122	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544.3	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	C-OCC	2116.8	381.0	163.3	0.0	$20.74	$270.00	$20.00	13.0	12.1
40LED	Hallway	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,693.4	7	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	4032	1,693.4	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
35LED	135	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	133	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	131	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544.3	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	C-OCC	2116.8	381.0	163.3	0.0	$20.74	$270.00	$20.00	13.0	12.1
35LED	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2016	181.4	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	1411.2	127.0	54.4	0.0	$6.91	$270.00	$20.00	39.1	36.2
32LED	Electric Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	8736	1,048.3	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	8736	1,048.3	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
35LED	129	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	3360	4,838.4	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	NONE	3360	4,838.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	127	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	322.6	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1881.6	225.8	96.8	0.0	$12.29	$270.00	$20.00	22.0	20.3
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	322.6	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1881.6	225.8	96.8	0.0	$12.29	$270.00	$20.00	22.0	20.3
32LED	Janitor	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2016	121.0	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1411.2	84.7	36.3	0.0	$4.61	$270.00	$20.00	58.6	54.2
32LED	Hallway	15	1T 32 R F 2 (ELE)	F42LL	60	0.9	SW	4032	3,628.8	15	1T 32 R F 2 (ELE)	F42LL	60	0.9	C-OCC	4032	3,628.8	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	105	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	103	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	101	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	102	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	104	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	106	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	Boiler Room	5	1T 32 R F 2 (ELE)	F42LL	60	0.3	SW	8736	2,620.8	5	1T 32 R F 2 (ELE)	F42LL	60	0.3	C-OCC	8736	2,620.8	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	107	15	1T 32 R F 2 (ELE)	F42LL	60	0.9	SW	3360	3,024.0	15	1T 32 R F 2 (ELE)	F42LL	60	0.9	C-OCC	2352	2,116.8	907.2	0.0	$115.21	$270.00	$20.00	2.3	2.2
40LED	107	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3360	806.4	4	T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	2352	564.5	241.9	0.0	$30.72	$270.00	$20.00	8.8	8.1
32LED	Copy Room	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3024	544.3	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	2116.8	381.0	163.3	0.0	$20.74	$270.00	$20.00	13.0	12.1
185LED	Old Office	4	T 40 R F 4 (ELE)	F44SE	172	0.7	SW	3024	2,080.5	4	T 40 R F 4 (ELE)	F44SE	172	0.7	C-OCC	2116.8	1,456.4	624.2	0.0	$79.27	$270.00	$20.00	3.4	3.2
35LED	124 Nurse Office	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	3024	1,633.0	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2116.8	1,143.1	489.9	0.0	$62.22	$270.00	$20.00	4.3	4.0
33	124 Nurse Office	1	13 W CF 1	CFQ13/1-L	15	0.0	SW	3024	45.4	1	13 W CF 1	CFQ13/1-L	15	0.0	C-OCC	2116.8	31.8	13.6	0.0	$1.73	$270.00	$20.00	156.2	144.7
35LED	124 Nurse Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3024	272.2	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	C-OCC	2116.8	190.5	81.6	0.0	$10.37	$270.00	$20.00	26.0	24.1
40LED	Principle Office	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3024	725.8	4	T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	2116.8	508.0	217.7	0.0	$27.65	$270.00	$20.00	9.8	9.0
71	Principle Office	1	I 60	I60/1	60	0.1	SW	3024	181.4	1	I 60	I60/1	60	0.1	C-OCC	2116.8	127.0	54.4	0.0	$6.91	$270.00	$20.00	39.1	36.2
35LED	Main Office	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	3024	2,449.4	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	C-OCC	2116.8	1,714.6	734.8	0.0	$93.32	$270.00	$20.00	2.9	2.7
40LED	Hallway	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,451.5	6	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	4032	1,451.5	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
40LED	I.S.S Office	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3024	1,088.6	6	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	2116.8	762.0	326.6	0.0	$41.48	$270.00	$20.00	6.5	6.0
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	362.9	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	254.0	108.9	0.0	$13.83	$270.00	$20.00	19.5	18.1
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	362.9	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	254.0	108.9	0.0	$13.83	$270.00	$20.00	19.5	18.1
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	362.9	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	254.0	108.9	0.0	$13.83	$270.00	$20.00	19.5	18.1
40LED	Hallway	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	4032	2,177.3	9	T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	4032	2,177.3	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
40LED	Hallway	3	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	4032	725.8	3	T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	4032	725.8	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
40LED	Hallway	10	T 32 R F 2 (ELE)	F42LL	60	0.6	SW	4032	2,419.2	10	T 32 R F 2 (ELE)	F42LL	60	0.6	C-OCC	4032	2,419.2	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
40LED	128	6	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	3360	1,209.6	6	T 32 R F 2 (ELE)	F42LL	60	0.4	NONE	3360	1,209.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	130	5	T 32 R F 2 (ELE)	F42LL	60	0.3	C-OCC	3360	1,008.0	5	T 32 R F 2 (ELE)	F42LL	60	0.3	NONE	3360	1,008.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	322.6	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1881.6	225.8	96.8	0.0	$12.29	$270.00	$20.00	22.0	20.3
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	322.6	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1881.6	225.8	96.8	0.0	$12.29	$270.00	$20.00	22.0	20.3
35LED	Multipurpose Room	50	T 32 R F 3 (ELE)	F43ILL/2	90	4.5	SW	2688	12,096.0	50	T 32 R F 3 (ELE)	F43ILL/2	90	4.5	C-OCC	2688	12,096.0	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
40LED	Kitchen	10	T 32 R F 2 (ELE)	F42LL	60	0.6	SW	2688	1,612.8	10	T 32 R F 2 (ELE)	F42LL	60	0.6	C-OCC	2688	1,612.8	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
40LED	Storage	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2016	241.9	2	T 32 R F 2 (ELE)	F42LL	60	0.1	NONE	2016	241.9	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
251	Gym	30	T 54 W F 5 (ELE) (T-5)	F45GHL	294	8.8	SW	2688	23,708.2	30	T 54 W F 5 (ELE) (T-5)	F45GHL	294	8.8	C-OCC	2688	23,708.2	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	Girls Locker	8	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2688	1,290.2	8	1T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2688	1,290.2	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	Boys Locker	9	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2688	1,451.5	9	1T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2688	1,451.5	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	Coach Room 1	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	362.9	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	254.0	108.9	0.0	$13.83	$270.00	$20.00	19.5	18.1
40LED	Coach Room 1	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	181.4	1	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	127.0	54.4	0.0	$6.91	$270.00	$20.00	39.1	36.2
32LED	Coach Room 2	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	362.9	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	254.0	108.9	0.0	$13.83	$270.00	$20.00	19.5	18.1
32LED	Room Next to Locker	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2016	362.9	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	1411.2	254.0	108.9	0.0	$13.83	$270.00	$20.00	19.5	18.1
32LED	Teacher Room	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	3024	1,814.4	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	C-OCC	2116.8	1,270.1	544.3	0.0	$69.13	$270.00	$20.00	3.9	3.6
32LED	Bath Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	322.6	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1881.6	225.8	96.8	0.0	$12.29	$270.00	$20.00	22.0	20.3
32LED	Office	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	362.9	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	254.0	108.9	0.0	$13.83	$270.00	$20.00	19.5	18.1
185LED	111	14	T 40 R F 4 (ELE)	F44SE	172	2.4	SW	3360	8,090.9	14	T 40 R F 4 (ELE)	F44SE	172	2.4	C-OCC	2352	5,663.6	2,427.3	0.0	$308.26	$270.00	$20.00	0.9	0.8
35LED	115	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	3360	1,814.4	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	C-OCC	2352	1,270.1	544.3	0.0	$69.13	$270.00	$20.00	3.9	3.6
5LED	Hallway	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	4032	967.7	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	C-OCC	4032	967.7	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	Boiler Room 2	4	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	8736	2,096.6	4	1T 32 R F 2 (ELE)	F42LL	60	0.2	C-OCC	8736	2,096.6	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	108	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	110	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	112	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	114	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	116	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	118	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	117	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	NONE	3360	4,233.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	119	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	NONE	3360	4,233.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	121	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	123	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	125	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
5LED	Hallway	13	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.8	SW	4032	3,145.0	13	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.8	C-OCC	4032	3,145.0	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	201	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	203	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	205	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
33	Hallway	4	13 W CF 1	CFQ13/1-L	15	0.1	SW	4032	241.9	4	13 W CF 1	CFQ13/1-L	15	0.1	C-OCC	4032	241.9	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
35LED	Hallway	14	T 32 R F 3 (ELE)	F43ILL/2	90	1.3	SW	4032	5,080.3	14	T 32 R F 3 (ELE)	F43ILL/2	90	1.3	C-OCC	4032	5,080.3	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	202	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	204	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
32LED	206B	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,209.6	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	2352	846.7	362.9	0.0	$46.09	$270.00	$20.00	5.9	5.4
32LED	206A	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	SW	3360	3,628.8	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	2352	2,540.2	1,088.6	0.0	$138.26	$270.00	$20.00	2.0	1.8
32LED	208A	8	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	3360	1,612.8	8	1T 32 R F 2 (ELE)	F42LL	60	0.5	C-OCC	2352	1,129.0	483.8	0.0	$61.45	$270.00	$20.00	4.4	4.1
32LED	208B	24	1T 32 R F 2 (ELE)	F42LL	60	1.4	SW	3360	4,838.4	24	1T 32 R F 2 (ELE)	F42LL	60	1.4	C-OCC	2352	3,386.9	1,451.5	0.0	$184.34	$270.00	$20.00	1.5	1.4
32LED	209	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,233.6	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	2352	2,963.5	1,270.1	0.0	$161.30	$270.00	$20.00	1.7	1.5
40LED	207	16	T 32 R F 2 (ELE)	F42LL	60	1.0	SW	3360	3,225.6	16	T 32 R F 2 (ELE)	F42LL	60	1.0	C-OCC	2352	2,257.9	967.7	0.0	$122.90	$270.00	$20.00	2.2	2.0
40LED	Stairwell	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4032	241.9	1	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	4032	241.9	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
35LED	211	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	213	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	3360	4,838.4	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	NONE	3360	4,838.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Hallway	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,451.5	6	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	4032	1,451.5	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	Electric Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	8736	1,048.3	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	8736	1,048.3	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
32LED	Faculty	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	181.4	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2116.8	127.0	54.4	0.0	$6.91	$270.00	$20.00	39.1	36.2
35LED	212	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3360	1,209.6	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	C-OCC	2352	846.7	362.9	0.0	$46.09	$270.00	$20.00	5.9	5.4
35LED	210 VP Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544.3	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	C-OCC	2116.8	381.0	163.3	0.0	$20.74	$270.00	$20.00	13.0	12.1
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	322.6	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1881.6	225.8	96.8	0.0	$12.29	$270.00	$20.00	22.0	20.3
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	322.6	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	1881.6	225.8	96.8	0.0	$12.29	$270.00	$20.00	22.0	20.3
35LED	215	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	217	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	214	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	216	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	218	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	220	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,628.8	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	NONE	3360	3,628.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4032	241.9	1	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	4032	241.9	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
40LED	Hallway	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,693.4	7	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	4032	1,693.4	0.0	0.0	$0.00	$270.00	$20.00		#DIV/0!
142LED	Outside Wallpack Light	16	MH 100	MH100/1	128	2.0	Breaker	4032	8,257.5	16	MH 100	MH100/1	128	2.0	NONE	4032	8,257.5	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
															0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
	Total	**1,109**				**85.3**			**281108.7**	**1109.0**				**85.3**			**250806.5**	**30302.2**	**0.0**	**3848.4**	**22140.0**	**1640.0**		
																	Demand Savings			**0.0**	**$0**			
																	kWh Savings			**30,302**	**$3,848**			
																	Total Savings				**$3,848**		**5.8**	**5.3**

Energy Audit of Carteret Middle School
CHA Project No. 30201
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	Main Entrance	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	4032	968	4	T 38 R LED	RTLED38	38	0.2	C-OCC	4,032	613	355	0.1	$ 53.55	$ 1,215.00	$ 120	22.7	20.4
35LED	Media Center	38	T 32 R F 3 (ELE)	F43ILL/2	90	3.4	SW	2688	9,193	38	T 59 R LED	RTLED38	38	1.4	C-OCC	2,688	3,881	5,311	2.0	$ 865.20	$ 9,247.50	$ 970	10.7	9.6
35LED	Child Study	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3024	1,089	4	T 59 R LED	RTLED38	38	0.2	C-OCC	2,117	322	767	0.2	$ 117.46	$ 1,215.00	$ 120	10.3	9.3
35LED	Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3024	272	1	T 59 R LED	RTLED38	38	0.0	C-OCC	2,117	80	192	0.1	$ 29.37	$ 506.25	$ 45	17.2	15.7
35LED	Office	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3024	1,089	4	T 59 R LED	RTLED38	38	0.2	C-OCC	2,117	322	767	0.2	$ 117.46	$ 1,215.00	$ 120	10.3	9.3
40LED	Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	T 38 R LED	RTLED38	38	0.1	C-OCC	2,117	161	202	0.0	$ 29.90	$ 742.50	$ 70	24.8	22.5
35LED	122	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544	2	T 59 R LED	RTLED38	38	0.1	C-OCC	2,117	161	383	0.1	$ 58.73	$ 742.50	$ 70	12.6	11.5
40LED	Hallway	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,693	7	T 38 R LED	RTLED38	38	0.3	C-OCC	4,032	1,073	621	0.2	$ 93.72	$ 1,923.75	$ 195	20.5	18.4
35LED	135	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
35LED	133	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
35LED	131	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544	2	T 59 R LED	RTLED38	38	0.1	C-OCC	2,117	161	383	0.1	$ 58.73	$ 742.50	$ 70	12.6	11.5
35LED	Storage	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	2016	181	1	T 59 R LED	RTLED38	38	0.0	C-OCC	1,411	54	128	0.1	$ 21.25	$ 506.25	$ 45	23.8	21.7
32LED	Electric Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	8736	1,048	2	STLED4	STLED4	40	0.1	C-OCC	8,736	699	349	0.0	$ 48.24	$ 983.40	$ 50	20.4	19.3
35LED	129	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	3360	4,838	16	T 59 R LED	RTLED38	38	0.6	NONE	3,360	2,043	2,796	0.8	$ 435.30	$ 3,780.00	$ 400	8.7	7.8
35LED	127	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	C-OCC	1,882	151	172	0.0	$ 25.71	$ 983.40	$ 50	38.3	36.3
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	C-OCC	1,882	151	172	0.0	$ 25.71	$ 983.40	$ 50	38.3	36.3
32LED	Janitor	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2016	121	1	STLED4	STLED4	40	0.0	C-OCC	1,411	56	65	0.0	$ 10.12	$ 626.70	$ 35	61.9	58.5
32LED	Hallway	15	1T 32 R F 2 (ELE)	F42LL	60	0.9	SW	4032	3,629	15	STLED4	STLED4	40	0.6	C-OCC	4,032	2,419	1,210	0.3	$ 182.56	$ 5,620.50	$ 245	30.8	29.4
32LED	105	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	103	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	101	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	102	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	104	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	106	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	Boiler Room	5	1T 32 R F 2 (ELE)	F42LL	60	0.3	SW	8736	2,621	5	STLED4	STLED4	40	0.2	C-OCC	8,736	1,747	874	0.1	$ 120.60	$ 2,053.50	$ 95	17.0	16.2
32LED	107	15	1T 32 R F 2 (ELE)	F42LL	60	0.9	SW	3360	3,024	15	STLED4	STLED4	40	0.6	C-OCC	2,352	1,411	1,613	0.3	$ 233.77	$ 5,620.50	$ 245	24.0	23.0
40LED	107	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3360	806	4	T 38 R LED	RTLED38	38	0.2	C-OCC	2,352	358	449	0.1	$ 65.50	$ 1,215.00	$ 120	18.5	16.7
32LED	Copy Room	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3024	544	3	STLED4	STLED4	40	0.1	C-OCC	2,117	254	290	0.1	$ 42.66	$ 1,340.10	$ 65	31.4	29.9
185LED	Old Office	4	T 40 R F 4 (ELE)	F44SE	172	0.7	SW	3024	2,081	4	T 50 R LED	RTLED50	50	0.2	C-OCC	2,117	423	1,657	0.5	$ 257.54	$ 1,215.00	$ 120	4.7	4.3
35LED	124 Nurse Office	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	3024	1,633	6	T 59 R LED	RTLED38	38	0.2	C-OCC	2,117	483	1,150	0.3	$ 176.19	$ 1,687.50	$ 170	9.6	8.6
33	124 Nurse Office	1	13 W CF 1	CFQ13/1-L	15	0.0	SW	3024	45	1	13 W CF 1	CFQ13/1-L	15	0.0	C-OCC	2,117	32	14	0.0	$ 1.73	$ 270.00	$ 20	156.2	144.7
35LED	124 Nurse Office	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.1	SW	3024	272	1	T 59 R LED	RTLED38	38	0.0	C-OCC	2,117	80	192	0.1	$ 29.37	$ 506.25	$ 45	17.2	15.7
40LED	Principle Office	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3024	726	4	T 38 R LED	RTLED38	38	0.2	C-OCC	2,117	322	404	0.1	$ 59.80	$ 1,215.00	$ 120	20.3	18.3
71	Principle Office	1	I 60	I60/1	60	0.1	SW	3024	181	1	CF 26	CFQ26/1-L	27	0.0	C-OCC	2,117	57	124	0.0	$ 18.97	$ 276.75	$ 20	14.6	13.5
35LED	Main Office	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.8	SW	3024	2,449	9	T 59 R LED	RTLED38	38	0.3	C-OCC	2,117	724	1,725	0.5	$ 264.29	$ 2,396.25	$ 245	9.1	8.1
40LED	Hallway	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,452	6	T 38 R LED	RTLED38	38	0.2	C-OCC	4,032	919	532	0.1	$ 80.33	$ 1,687.50	$ 170	21.0	18.9
40LED	I.S.S Office	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3024	1,089	6	T 38 R LED	RTLED38	38	0.2	C-OCC	2,117	483	606	0.1	$ 89.70	$ 1,687.50	$ 170	18.8	16.9
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	T 38 R LED	RTLED38	38	0.1	C-OCC	2,117	161	202	0.0	$ 29.90	$ 742.50	$ 70	24.8	22.5
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	T 38 R LED	RTLED38	38	0.1	C-OCC	2,117	161	202	0.0	$ 29.90	$ 742.50	$ 70	24.8	22.5
40LED	I.S.S Office	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	T 38 R LED	RTLED38	38	0.1	C-OCC	2,117	161	202	0.0	$ 29.90	$ 742.50	$ 70	24.8	22.5
40LED	Hallway	9	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	4032	2,177	9	T 38 R LED	RTLED38	38	0.3	C-OCC	4,032	1,379	798	0.2	$ 120.49	$ 2,396.25	$ 245	19.9	17.9
40LED	Hallway	3	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	4032	726	3	T 38 R LED	RTLED38	38	0.1	C-OCC	4,032	460	266	0.1	$ 40.16	$ 978.75	$ 95	24.4	22.0
40LED	Hallway	10	T 32 R F 2 (ELE)	F42LL	60	0.6	SW	4032	2,419	10	T 38 R LED	RTLED38	38	0.4	C-OCC	4,032	1,532	887	0.2	$ 133.88	$ 2,632.50	$ 270	19.7	17.6
40LED	128	6	T 32 R F 2 (ELE)	F42LL	60	0.4	C-OCC	3360	1,210	6	T 38 R LED	RTLED38	38	0.2	NONE	3,360	766	444	0.1	$ 69.06	$ 1,417.50	$ 150	20.5	18.4
40LED	130	5	T 32 R F 2 (ELE)	F42LL	60	0.3	C-OCC	3360	1,008	5	T 38 R LED	RTLED38	38	0.2	NONE	3,360	638	370	0.1	$ 57.55	$ 1,181.25	$ 125	20.5	18.4
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	C-OCC	1,882	151	172	0.0	$ 25.71	$ 983.40	$ 50	38.3	36.3
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	C-OCC	1,882	151	172	0.0	$ 25.71	$ 983.40	$ 50	38.3	36.3
35LED	Multipurpose Room	50	T 32 R F 3 (ELE)	F43ILL/2	90	4.5	SW	2688	12,096	50	T 59 R LED	RTLED38	38	1.9	C-OCC	2,688	5,107	6,989	2.6	$ 1,138.43	$ 12,082.50	$ 1,270	10.6	9.5
40LED	Kitchen	10	T 32 R F 2 (ELE)	F42LL	60	0.6	SW	2688	1,613	10	T 38 R LED	RTLED38	38	0.4	C-OCC	2,688	1,021	591	0.2	$ 96.33	$ 2,632.50	$ 270	27.3	24.5
40LED	Storage	2	T 32 R F 2 (ELE)	F42LL	60	0.1	C-OCC	2016	242	2	T 38 R LED	RTLED38	38	0.1	NONE	2,016	153	89	0.0	$ 15.51	$ 472.50	$ 50	30.5	27.2
251	Gym	30	T 54 W F 5 (ELE) (T-5)	F45GHL	294	8.8	SW	2688	23,708	30	T 54 W F 5 (ELE) (T-5)	F45GHL	294	8.8	C-OCC	2,688	23,708	-	0.0	$ -	$ 270.00	$ 20		
32LED	Girls Locker	8	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2688	1,290	8	STLED4	STLED4	40	0.3	C-OCC	2,688	860	430	0.2	$ 70.06	$ 3,123.60	$ 140	44.6	42.6
32LED	Boys Locker	9	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	2688	1,452	9	STLED4	STLED4	40	0.4	C-OCC	2,688	968	484	0.2	$ 78.81	$ 3,480.30	$ 155	44.2	42.2
32LED	Coach Room 1	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	STLED4	STLED4	40	0.1	C-OCC	2,117	169	194	0.0	$ 28.44	$ 983.40	$ 50	34.6	32.8
40LED	Coach Room 1	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	181	1	T 38 R LED	RTLED38	38	0.0	C-OCC	2,117	80	101	0.0	$ 14.95	$ 506.25	$ 45	33.9	30.9
32LED	Coach Room 2	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	STLED4	STLED4	40	0.1	C-OCC	2,117	169	194	0.0	$ 28.44	$ 983.40	$ 50	34.6	32.8
32LED	Room Next to Locke	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2016	363	3	STLED4	STLED4	40	0.1	C-OCC	1,411	169	194	0.1	$ 30.37	$ 1,340.10	$ 65	44.1	42.0
32LED	Teacher Room	10	1T 32 R F 2 (ELE)	F42LL	60	0.6	SW	3024	1,814	10	STLED4	STLED4	40	0.4	C-OCC	2,117	847	968	0.2	$ 142.19	$ 3,837.00	$ 170	27.0	25.8
32LED	Bath Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	C-OCC	1,882	151	172	0.0	$ 25.71	$ 983.40	$ 50	38.3	36.3
32LED	Office	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	363	2	STLED4	STLED4	40	0.1	C-OCC	2,117	169	194	0.0	$ 28.44	$ 983.40	$ 50	34.6	32.8
185LED	111	14	T 40 R F 4 (ELE)	F44SE	172	2.4	SW	3360	8,091	14	T 50 R LED	RTLED50	50	0.7	C-OCC	2,352	1,646	6,444	1.7	$ 983.24	$ 3,577.50	$ 370	3.6	3.3
35LED	115	6	T 32 R F 3 (ELE)	F43ILL/2	90	0.5	SW	3360	1,814	6	T 59 R LED	RTLED38	38	0.2	C-OCC	2,352	536	1,278	0.3	$ 192.43	$ 1,687.50	$ 170	8.8	7.9
5LED	Hallway	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	4032	968	4	2T 25 R LED	2RTLED	25	0.1	C-OCC	4,032	403	564	0.1	$ 85.20	$ 1,080.00	$ 80	12.7	11.7
32LED	Boiler Room 2	4	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	8736	2,097	4	STLED4	STLED4	40	0.2	C-OCC	8,736	1,398	699	0.1	$ 96.48	$ 1,696.80	$ 80	17.6	16.8
32LED	108	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
32LED	110	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
32LED	112	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
32LED	114	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
32LED	116	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
32LED	118	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
32LED	117	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	3360	4,234	21	STLED4	STLED4	40	0.8	NONE	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$ 315	34.1	32.7
32LED	119	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	C-OCC	3360	4,234	21	STLED4	STLED4	40	0.8	NONE	3,360	2,822	1,411	0.4	$ 219.74	$ 7,490.70	$ 315	34.1	32.7
32LED	121	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
32LED	123	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
32LED	125	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	C-OCC	3360	3,629	18	STLED4	STLED4	40	0.7	NONE	3,360	2,419	1,210	0.4	$ 188.35	$ 6,420.60	$ 270	34.1	32.7
5LED	Hallway	13	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.8	SW	4032	3,145	13	2T 25 R LED	2RTLED	25	0.3	C-OCC	4,032	1,310	1,835	0.5	$ 276.89	$ 2,902.50	$ 215	10.5	9.7
32LED	201	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	203	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	205	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
33	Hallway	4	13 W CF 1	CFQ13/1-L	15	0.1	SW	4032	242	4	13 W CF 1	CFQ13/1-L	15	0.1	C-OCC	4,032	242	-	0.0	$ -	$ 270.00	$ 20		
35LED	Hallway	14	T 32 R F 3 (ELE)	F43ILL/2	90	1.3	SW	4032	5,080	14	T 59 R LED	RTLED38	38	0.5	C-OCC	4,032	2,145	2,935	0.7	$ 443.02	$ 3,577.50	$ 370	8.1	7.2
32LED	202	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	204	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
32LED	206B	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,210	6	STLED4	STLED4	40	0.2	C-OCC	2,352	564	645	0.1	$ 93.51	$ 2,410.20	$ 110	25.8	24.6
32LED	206A	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	SW	3360	3,629	18	STLED4	STLED4	40	0.7	C-OCC	2,352	1,693	1,935	0.4	$ 280.52	$ 6,690.60	$ 290	23.9	22.8
32LED	208A	8	1T 32 R F 2 (ELE)	F42LL	60	0.5	SW	3360	1,613	8	STLED4	STLED4	40	0.3	C-OCC	2,352	753	860	0.2	$ 124.68	$ 3,123.60	$ 140	25.1	23.9
32LED	208B	24	1T 32 R F 2 (ELE)	F42LL	60	1.4	SW	3360	4,838	24	STLED4	STLED4	40	1.0	C-OCC	2,352	2,258	2,580	0.5	$ 374.03	$ 8,830.80	$ 380	23.6	22.6
32LED	209	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	3360	4,234	21	STLED4	STLED4	40	0.8	C-OCC	2,352	1,976	2,258	0.4	$ 327.28	$ 7,760.70	$ 335	23.7	22.7
40LED	207	16	T 32 R F 2 (ELE)	F42LL	60	1.0	SW	3360	3,226	16	T 38 R LED	RTLED38	38	0.6	C-OCC	2,352	1,430	1,796	0.4	$ 262.00	$ 4,050.00	$ 420	15.5	13.9
40LED	Stairwell	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4032	242	1	T 38 R LED	RTLED38	38	0.0	C-OCC	4,032	153	89	0.0	$ 13.39	$ 506.25	$ 45	37.8	34.5
35LED	211	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
35LED	213	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	C-OCC	3360	4,838	16	T 59 R LED	RTLED38	38	0.6	NONE	3,360	2,043	2,796	0.8	$ 435.30	$ 3,780.00	$ 400	8.7	7.8
40LED	Hallway	6	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,452	6	T 38 R LED	RTLED38	38	0.2	C-OCC	4,032	919	532	0.1	$ 80.33	$ 1,687.50	$ 170	21.0	18.9
32LED	Electric Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	8736	1,048	2	STLED4	STLED4	40	0.1	C-OCC	8,736	699	349	0.0	$ 48.24	$ 983.40	$ 50	20.4	19.3
32LED	Faculty	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	3024	181	1	STLED4	STLED4	40	0.0	C-OCC	2,117	85	97	0.0	$ 14.22	$ 626.70	$ 35	44.1	41.6
35LED	212	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.4	SW	3360	1,210	4	T 59 R LED	RTLED38	38	0.2	C-OCC	2,352	358	852	0.2	$ 128.28	$ 1,215.00	$ 120	9.5	8.5
35LED	210 VP Office	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.2	SW	3024	544	2	T 59 R LED	RTLED38	38	0.1	C-OCC	2,117	161	383	0.1	$ 58.73	$ 742.50	$ 70	12.6	11.5
32LED	Girls Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	C-OCC	1,882	151	172	0.0	$ 25.71	$ 983.40	$ 50	38.3	36.3
32LED	Boys Room	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2688	323	2	STLED4	STLED4	40	0.1	C-OCC	1,882	151	172	0.0	$ 25.71	$ 983.40	$ 50	38.3	36.3
35LED	215	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
35LED	217	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
35LED	214	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
35LED	216	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
35LED	218	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
35LED	220	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	C-OCC	3360	3,629	12	T 59 R LED	RTLED38	38	0.5	NONE	3,360	1,532	2,097	0.6	$ 326.48	$ 2,835.00	$ 300	8.7	7.8
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	4032	242	1	T 38 R LED	RTLED38	38	0.0	C-OCC	4,032	153	89	0.0	$ 13.39	$ 506.25	$ 45	37.8	34.5
40LED	Hallway	7	T 32 R F 2 (ELE)	F42LL	60	0.4	SW	4032	1,693	7	T 38 R LED	RTLED38	38	0.3	C-OCC	4,032	1,073	621	0.2	$ 93.72	$ 1,923.75	$ 195	20.5	18.4
142LED	Outside Wallpack Light	16	MH 100	MH100/1	128	2.0	Breaker	4032	8,258	16	FXLED39	FXLED39/1	39	0.6	NONE	4,032	2,516	5,742	1.4	$ 866.57	$ 8,899.20	$ 800	10.3	9.3
															0	#N/A								#VALUE!
															0	#N/A								#VALUE!
															0	#N/A								#VALUE!
S	**Total**	**1,109**				**85.3**			**281,109**	**1,109**				**50.9**			**148,057**		**34.4**	**20,216**	**353,663**	**$22,595**		
S																	**Demand Savings**			**34.4**	**$3,318**			
S																	**kWh Savings**			**133,052**	**$16,898**			
S																	**Total Savings**				**$20,216**		**17.5**	**16.4**

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

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

- HURRICANE SANDY
- PROGRAMS
  - NJ SMARTSTART BUILDINGS
    - EQUIPMENT INCENTIVES
    - FOOD SERVICE EQUIPMENT
    - APPLICATION FORMS
    - TOOLS AND RESOURCES
  - PAY FOR PERFORMANCE
  - COMBINED HEAT & POWER AND FUEL CELLS
  - LOCAL GOVERNMENT ENERGY AUDIT
  - LARGE ENERGY USERS PROGRAM
  - ENERGY SAVINGS IMPROVEMENT PROGRAM
  - DIRECT INSTALL
  - ENERGY BENCHMARKING
  - OIL, PROPANE, MUNICIPAL & COOP ELECTRIC CUSTOMERS
  - EDA PROGRAMS
  - SBC CREDIT PROGRAM
  - PAST PROGRAMS
- TOOLS AND RESOURCES
- PROGRAM UPDATES
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NJ SmartStart Buildings

Program Overview

With New Jersey SmartStart Buildings …

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

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

- Project Categories
- SmartStart Applications
- Program Terms and Conditions
- Find a Trade Ally

Incentives for Qualifying Equipment and Projects

Financial incentives are available for size projects which can offset some - or maybe even all - of the added cost to purchase qualifying energy-efficient equipment.

Support for Custom Energy-Efficiency Measures

Custom measures gives you the opportunity to receive an incentive for unique energy-efficiency measures that are not on the prescriptive equipment list, but are new/innovative or project/facility specific.

Application and Eligibility Process

We have made it even easier to participate! Pre-approval is no longer required for prescriptive measures, with the exception of prescriptive & performance lighting and lighting controls. Please note that anyone who purchases and installs equipment without Market Manager approval does so at his/her own risk.

Program Updates

- Notice of Fiscal Year 2016 Program Changes

Other updates posted.

Program Literature

Applications and Brochures
Download the Latest Program Materials

Success Stories

Panasonic Corporation of North America
Continued Commitment to Saving Energy

Local Govt and Schools

Find out what financial incentives are available today!

Business Energy Advisor

Learn more about energy use & savings in your industry

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    - APPLICATION FORMS
    - TOOLS AND RESOURCES
  - PAY FOR PERFORMANCE
  - COMBINED HEAT & POWER AND FUEL CELLS
  - LOCAL GOVERNMENT ENERGY AUDIT
  - LARGE ENERGY USERS PROGRAM
  - ENERGY SAVINGS IMPROVEMENT PROGRAM
  - DIRECT INSTALL
  - ENERGY BENCHMARKING
  - OIL, PROPANE, MUNICIPAL & COOP ELECTRIC CUSTOMERS
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Equipment Incentives

More reasons for a smart start on your next project!

New Jersey SmartStart Buildings provides **financial incentives for qualifying equipment**. These incentives help 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)

Application and Eligibility Process

For all Prescriptive measures with the exception of Prescriptive & Performance Lighting and Lighting Controls, pre-approval is not required prior to installation, however any customer and/or agent who purchases and installs equipment without Market Manager approval does so at their own risk.

Eligibility: 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. A complete application package should include:

- Completed application forms signed by the customer
- Manufacturer specification sheets and supporting documentation of qualifications.
- Recent copy of a full utility bill from a participating utility (gas or electric depending on technology) showing societal benefits charge.
  - Name of the customer listed on the application must match the name of the customer listed on the utility bill.
  - For new construction projects where a utility account has not yet been established, the customer will be required to submit a utility bill prior to incentive payment however it does not need to be included with the initial application submission.
- W-9 form completed for incentive payee.

For completed projects that do not require program pre-approval (excluding Prescriptive Lighting, Prescriptive Lighting Controls, Performance Lighting and Custom Measures) the application must be submitted to the Market Manager within 12 months of equipment purchase. Sufficient documentation must be provided confirming the date of equipment purchase (material invoice, purchase order, etc.). Customers may choose to submit additional documentation to allow the program to process payment including a valid Tax Clearance Certificate for the customer (see tax clearance requirements) and final invoice documentation. All projects are subject to post-inspection to confirm equipment installation prior to payment.

Pre-Inspections: the Market Manager reserves the right to conduct a pre-inspection of the facility prior to the installation of lighting, lighting control equipment and custom measures. This will be done prior to the issuance of the approval letter. Work must not begin prior to formal program approval.

Tax Clearance Requirements: the name of the customer listed on the certificate must match the customer name listed on the utility bill and application. In addition, the customer tax ID listed on the application must agree with the tax ID on the Certificate. Certificates are valid for 180 days and must be valid on the date the Market Manager signs off on the incentive.

Utility account: Each utility account requires a complete, separate application. Projects for the same utility account that are being done at the same time must be submitted on one application. Applications for measures that are self-installed by customers must be signed 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 Market Manager on or before June 30, 2016 in order to be eligible for the fiscal year program (July 1, 2015 - June 30, 2016) incentives.

Expirations: Pre-approved projects are given a one year approval in which the proposed measure is to be installed and operational. When a project has expired the customer will have 30 days to either submit a request for an extension OR submit final project paperwork. Extension requests must be in writing from the customer and include the circumstances that led to the extension request, and the percentage of the project completed. Extension requests may be granted for a period no longer than six (6) months. The Market Manager may provide up to two, six month extensions from the original approval expiration date. If the project has not started and the applicant is still interested in installing the equipment, the existing application will be cancelled and a new application must be submitted and approved

Program Updates

- Notice of Fiscal Year 2016 Program Changes

Other updates posted.

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prior to installation. The incentive amount will be based upon the program guidelines in effect at the time of the new submission. If no response is received within 30 days of expiration the project will be cancelled.

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**.

Electric Chillers

Gas Cooling

Electric Unitary HVAC

Ground Source Heat Pumps

Gas Heating

Variable Frequency Drives

Gas Water Heating

Prescriptive lighting Application

Lighting Controls

Performance Lighting

Refrigeration Doors

Refrigeration Controls

Food Service Equipment

Refrigerator/Freezer Motors

Custom Measures

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

II. DIRECT INSTALL

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

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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 to start and how to get through the process. Created specifically for existing small to medium-sized facilities, Direct Install is a turnkey solution that makes it easy and affordable to upgrade to high efficiency equipment. Direct Install is designed to cut your facility's energy costs by replacing lighting, HVAC and other outdated operational equipment with energy efficiency alternatives. The program pays up to 70% of retrofit costs, dramatically improving your payback on the project. There is a $125,000 incentive cap on each project.

ELIGIBILITY

Existing small to mid-sized commercial and industrial facilities with a peak electric demand that did not exceed 200 kW in any of the preceding 12 months are eligible to participate in Direct Install. Applicants will submit the last 12 months of electric utility bills indicating that they are below the demand threshold and have occupied the building during that time. Buildings must be located in New Jersey and served by one of the state's public, regulated electric or natural gas utility 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, types and capacities. Boilers may not exceed 1,500,000 Btuh and furnaces may not exceed 140,000 Btuh. Limitations on packaged HVAC, motors and other equipment also apply. Larger capacity equipment may be eligible for financial incentives through NJ SmartStart Buildings.

See how other small businesses owners have saved!

BENEFITS OF DIRECT INSTALL

Turnkey Process - A network of selected participating contractors address your project from start to finish, beginning with an assessment of your facility, and ending with the installation of eligible energy-efficient equipment.

Minimal Cost - Your share of the project's cost will be approximately 30%, the program pays the remaining 70%. With incentives so dramatic, your upgrade project can very quickly pay for itself.

Fast Turnaround Time - Project installations are typically completed within 90 days from the time of scheduling your energy assessment.

Ongoing Savings - Your new energy-efficient equipment will provide savings for years to come through dramatically reduced energy costs on your monthly utility bills.

Program Updates

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Other updates posted.

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STEPS TO PARTICIPATION

View a step-by-step description of the program.

Program Participants

III. PAY FOR PERFORMANCE (P4P)

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Pay for Performance

NEW JERSEY'S CLEAN ENERGY PROGRAM
P4P
PAY FOR PERFORMANCE
APPROVED PARTNER

Pay for Performance is a comprehensive energy efficiency program that provides incentives towards whole-building energy improvements. Choose the component that best describes your building.

Program Participants

EXISTING BUILDINGS

The Existing Buildings component is designed for commercial and industrial buildings with a peak demand in excess of 200 kW in any of the preceding twelve months, and 100kW for select multifamily buildings. Save 15% or more on the energy consumption in your buildings with the help of our approved partners and receive incentives along the way.

NEW CONSTRUCTION

The New Construction component is designed for new commercial, industrial, and multifamily buildings with 50,000 square feet or more of planned space, as well as buildings undergoing substantial renovation. Construct your building to achieve energy costs 15% below the current energy code with the help of our approved partners and receive incentives.

Program Updates

- Notice of Fiscal Year 2016 Program Changes

Other updates posted.

Program Literature

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Pay for Performance - Existing Buildings - Participation Steps

Participating in the Pay for Performance Program is easy. Just follow this step-by-step process...

- Select a program partner from this list of approved partners. Be sure to download this flyer for tips on how to select a partner as well as ideas for what to expect from your working relationship.
- Submit Application Package - With your assistance, your partner will download and complete the Application and Participation Agreement and submit the forms and required documentation according to the Instructions section of the application.
- Receive Approval Notice - Program representatives will review your application package and if approved, will send a notice to proceed. A case manager will be assigned to your project.
- Develop Benchmarks and Goals. Your partner will benchmark your building, identify performance goals and create an energy reduction plan to achieve no less than 15% energy savings.
- Submit Your Plan - Your partner will submit your energy reduction plan, a complete benchmarking report and partner-participant contract with a request for Incentive #1 as defined in the participation agreement. When the energy reduction plan is approved, you will receive Incentive #1.
- Implement Your Project - Your partner will help you with the bidding process and will monitor construction to ensure that the appropriate steps are being taken to achieve the expected performance goals.

- Submit Request for Second Incentive - Your partner will submit a request for Incentive #2 along with the material and labor invoices when the project is complete. When approved, you will receive Incentive #2.
- Submit Request for Final Incentive - Within approximately 12 months after the project is completed, your partner will re-benchmark the building and submit a request for Incentive #3 along with the post-construction benchmarking report. If the building performance goal is met, you will receive Incentive #3.

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

Program Updates

- Notice of Fiscal Year 2016 Program Changes

Other updates posted.

Program Literature

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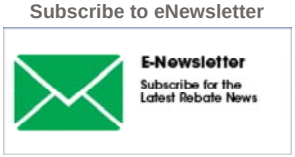

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Pay for Performance - Existing Buildings - Applications and Forms

Forms should be completed with the assistance of your program partner. The forms are available in electronic (eForms) format, which allows you to complete the forms on your computer and save them at your convenience. Acrobat Reader 5.0 or greater is required to use eForms.

Incentive Structure

- Program Application
- Incentive Request Form One
- Incentive Request Form Two
- Incentive Request Form Three
- Installation Agreement
- Building Performance with ENERGY STAR Participation Agreement

Program Updates

- Notice of Fiscal Year 2016 Program Changes

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New Jersey's cleanenergy program — njcleanenergy.com

BPU — New Jersey Board of Public Utilities

NEW JERSEY'S CLEAN ENERGY PROGRAM
P4P PAY FOR PERFORMANCE

How did you learn about this Energy Efficiency Program?
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☐ Tradeshow/Event ☐ Word of Mouth ☐ Radio ☐ Contractor
☐ Other _____

PAY FOR PERFORMANCE APPLICATION FORM

July 1, 2015 – June 30, 2016

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 Participation Agreement (pages 3,4) and sign where indicated.
2. Fill out all applicable spaces on this form. Note Customer/Owner Information must be listed for the utility rate payer of the Project facility.
3. Provide a copy of the customer's company W-9 form.
4. Provide the most recent (within 2 years) consecutive 12 month period of utility bills for the project for all accounts, organized in chronological order and separated by account. Utilize Utility Tool for applications with multiple accounts to organize data.
5. Provide brief description of facility, noting any special or unusual circumstances and/or site conditions.
6. 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	NAICS Code

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 – Utility:_____ Program Name: _____

Federal Program – Organization: _____ Program Name: _____

Other Program – Organization: _____ Program Name: _____

Additional Project information

Additional Utility Account(s)

Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number
Account type	Account number

Additional Comments:

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

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

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

Visit our website: NJCleanEnergy.com/P4P

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

ADMINISTRATOR – New Jersey Board of Public Utilities (NJBPU)

APPLICATION PROCESS – The Program pays incentives in phases upon satisfactory completion of each of three Program milestones - approval of a complete Energy Reduction Plan, installation of all recommended measures per the Energy Reduction Plan, completion of Post-Construction Benchmarking Report (for incentive amounts, please refer to Incentive Amounts). In order to be eligible for Program Incentives, a Participating Customer or an agent authorized by a Customer, must submit to the Market Manager a properly completed application package – application form, Participating Customer's company W-9, twelve consecutive months of the project's utility bills and executed Participation Agreement. All components of the application package must be filled out completely, truthfully and accurately. This application package must be received on or before June 30, 2016 in order to be eligible for the Fiscal Year 2016 Incentives. The Market Manager will review the application package to determine if the project is eligible for a Program Incentive. When approved, the Participating Customer will receive an approval letter from their Case Manager with the estimated authorized first incentive amount and the date by which the Energy Reduction Plan must be submitted. Upon receipt of the approval letter, the Participating Customer and Partner may proceed with work on the Energy Reduction Plan. The Market Manager or agent thereof reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the Energy Reduction Plan approval letter. Approval of this Application is not an approval of the project's scope of work. Scope of work is only approved upon approval of the Energy Reduction Plan. See application and program guidelines for more information.

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

ELIGIBILITY - Program Incentives are available to existing commercial and industrial buildings with peak kilowatt demand usage of more than 200 kW in any of the most recent preceding twelve months of utility bills, 100 kW for multifamily buildings, and a customer of the New Jersey Utilities. Market Manager has the discretion to approve applications that fall below the 200 kW minimum, 100 kW for multifamily, by no more than 10%. If the Participant is a municipal electric company customer, and a customer of an investor-owned gas New Jersey Utility, only gas measures will be eligible for incentives under the Program. Similarly, if the Participant is an oil/propane customer and a customer of an investor-owned electric New Jersey Utility, only electricity measures will be eligible for incentives under the Program.

Projects may not participate or apply for incentives for energy efficient measures through other New Jersey's Clean Energy Programs while participating in this Program. Equipment procured by participating Customer through another program offered by New Jersey Utilities, as applicable, is not eligible for incentives through this Program. Customers who, from July 1, 2014 - June 30, 2015, have not contributed to the Societal Benefits Charge of the applicable New Jersey Utility, may not be eligible for incentives offered through this program.

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

ENERGY-EFFICIENT MEASURES – Any device eligible to receive a Program Incentive payment through the New Jersey's Clean Energy Commercial and Industrial Program

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

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

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

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

INCENTIVE CAP – Program Incentives #2 and #3 will be capped not to exceed 50% of the total project cost, lesser of estimated or actual. Incentive #1 will be capped not to exceed 50% of the project's annual energy cost. Program Incentives (Incentive #1, #2 and #3) are restricted to $1M per gas and electric account (limited to $2M per project) in a program year. Campus style facilities, which are mastered-metered, are subject to the annual incentive cap of $1 million per gas and electric account. The Participating Customer will also be subject to an annual Entity Cap of $4M or $5M if a Combined Heat and Power/Fuel Cell Application is approved for the same facility (Definition of an Entity can be found in the Board Order Docket No. EO07030203).

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

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

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

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

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

Upon review of the submittal package (by the Market Manager or agent thereof), the remaining 50% of the total performance-based incentive (Incentives #2 & #3) will be released to the Participating Customer. If the Post-Construction Benchmarking Report indicates that the project did not meet the minimum performance target, the post-installation completion period may be extended to up to twenty-four months subsequent to the Incentive Payment #2 package approval date. If after this time the minimum performance target is still not met, the final Incentive #3 will not be paid.

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

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

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

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

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

PERFORMANCE TARGET – A minimum of a 15% annual source energy savings must be achieved in order to participate. The performance target is based on reducing the total energy consumption for the facility. No more than 50% of the total source energy savings may be derived from lighting measures; up to 70% lighting savings may be considered but performance target will increase by 1% for each percent over 50% (e.g. project with 60% savings from lighting will have a minimum performance target of 25%). A 4% performance target may be offered to customers whose annual energy consumption is heavily weighted to manufacturing and process loads, as well as hospitals. This approach will be reviewed on a case-by-case basis and must be pre-approved by the Market Manager. In order to be considered, the project must involve: A manufacturing facility, including such industries as plastics and packaging, chemicals, petrochemicals, metals, paper and pulp, transportation, biotechnology, pharmaceutical, food and beverage, mining and mineral processing, general manufacturing, equipment manufacturers and data centers; and manufacturing and/or process-related loads, including data center consumption, consume 50% or more of total facility energy consumption. For hospitals, 50% or more of the gross floor area must be used for general medical and surgical services and 50% or more of the licensed beds must provide acute care services. The total energy savings may not come from a single measure. No more than 50% of the total source energy savings may be derived from non-investor owned utilities or fuels.

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

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

PRE-INSTALLED MEASURES - An Energy Reduction Plan must be approved by the program and an approval letter sent to the customer in order for incentives to be committed. Upon receipt of an Energy Reduction Plan, all project facilities must be pre-inspected. Measures installed prior to pre-inspection of the facility shall not be included as part of the ERP scope of work and will not be eligible for incentive

Measure installation undertaken prior to ERP approval, but after pre-inspection, is done at the customer's own risk. In the event that an Energy Reduction Plan is rejected by the program, the customer will not receive any incentives.

PRODUCT INSTALLATION OR EQUIPMENT INSTALLATION – Installation of the Energy-Efficient Measures. Projects with a contract threshold of $15,444 are required to pay no less than prevailing wage rate to workers employed in the performance of any construction undertaken in connection with Board of Public Utilities financial assistance, or undertaken to fulfill any condition of receiving Board of Public Utilities financial assistance, including the performance of any contract to construct, renovate or otherwise prepare a facility, the operations of which are necessary for the receipt of Board of Public Utilities financial assistance. By submitting an application, or accepting program incentives, applicant agrees to adhere to New Jersey Prevailing Wage requirements, as applicable.

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

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

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

PROGRAM OFFER – The Program covers products purchased and/or services rendered on or after July 1, 2015.

PROJECT – A commercial or industrial existing building with peak demand in excess of 200 kW in any of the most recent preceding twelve months of electric usage, 100 kW for multifamily buildings. Multifamily building(s) must be four (4) stories or greater or three (3) stories and under having central heating, cooling, or metering serving more than one building. Refer to Multifamily Decision Tree.

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

TAX LIABILITY – The Market Manager will not be responsible for any tax liability that may be imposed on any Participating Customer as a result of the payment of Program Incentives. All Participating Customers must supply their federal tax identification number or social security number on the application form in addition to providing a copy of their W-9 form as part of the application package in order to receive a Program Incentive.

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

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

ACKNOWLEDGEMENT – I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Market Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the Pay For Performance Program, including the release of electric and natural gas utility billing information, as well as make available to the public non-sensitive information. I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of New Jersey's Clean Energy Program. This arrangement supersedes all other communications and representations.

CUSTOMER'S SIGNATURE

PARTNER SIGNATURE

By signing, I certify that I have read, understand and agree to the Participation Agreement listed above.

IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

- HURRICANE SANDY
- PROGRAMS
  - NJ SMARTSTART BUILDINGS
  - PAY FOR PERFORMANCE
  - COMBINED HEAT & POWER AND FUEL CELLS
  - LOCAL GOVERNMENT ENERGY AUDIT
  - LARGE ENERGY USERS PROGRAM
  - ENERGY SAVINGS IMPROVEMENT PROGRAM
  - DIRECT INSTALL
  - ENERGY BENCHMARKING
  - OIL, PROPANE, MUNICIPAL & COOP ELECTRIC CUSTOMERS
  - EDA PROGRAMS
  - SBC CREDIT PROGRAM
  - PAST PROGRAMS
- TOOLS AND RESOURCES
- PROGRAM UPDATES
- CONTACT US

Home » Commercial & Industrial » Programs

Energy Savings Improvement Program

A new State law allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. 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 improve and reduce energy usage with minimal expenditure of new financial resources.

Please review the New Jersey's Clean Energy Program (NJCEP) and ESIP Interaction memo and flow chart for recommendations on when to submit incentive applications to various NJCEP programs relative to the ESIP timeframe.

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

- Local Government
- School Districts (K-12)

All RFPs and final Energy Savings Plan (ESP) 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 efficiency improvements. Local units should carefully consider all alternatives to develop an approach that best meets their needs. Local units considering an ESIP should carefully review the Local Finance Notice, the law, and consult with qualified professionals to determine how they should approach the task.

The NJ Board of Public Utilities sponsored Sustainable Jersey in the creation of an ESIP Guidebook that explains how to implement the program. The guidebook also includes case studies 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 energy audit, as prescribed in P.L.2012 c.55.

ENERGY SAVINGS PLANS

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

- Ocean Township Board of Education:
  - Part 1
  - Part 2
  - Part 3
  - Part 4
- Tabernacle Board of Education
- Robbinsville Board of Education
- Frankford Township School District
- Northern Hunterdon-Voorhees Regional High School
- Manalapan Township (***180 MB*** *- Right Click, Save As)*

Program Updates

- Notice of Fiscal Year 2016 Program Changes

Other updates posted.

Program Literature

Success Stories

Local Govt and Schools

Business Energy Advisor

Subscribe to eNewsletter

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APPENDIX E

Photovoltaic Analysis

Carteret Board of Education
Carteret Middle School

Cost of Electricity	$0.153	/kWh
Electricity Usage	749,800	kWh/yr
System Unit Cost	$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$680,000	**170.0**	**216,730**	**0**	**$33,160**	**0**	**$33,160**	**$0**	**$36,844**	**20.5**	**9.7**

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= $170 /1000kwh

Area Output*
2,923 m2
31,463 ft2

Perimeter Output*
177 m
581 ft

Available Roof Space for PV:
(Area Output - 10 ft x Perimeter) x 85%
21,802 ft2

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

8 watt/ft2
174,413 DC watts
170 kW Enter into PV Watts

PV Watts Inputs***

Array Tilt Angle	20	Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)
Array Azimuth	180	Enter into PV Watts (default)
Zip Code	07008	Enter into PV Watts
DC/AC Derate Factor	0.83	Enter info PV Watts

PV Watts Output
216,730 annual kWh calculated in PV Watts program

% Offset Calc

Usage	749,800	(from utilities)
PV Generation	216,730	(generated using PV Watts)
% offset	29%	

* http://www.freemaptools.com/area-calculator.htm
** http://www.flettexchange.com
*** http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at http://sam.nrel.gov) that allow for more precise and complex modeling of PV systems.

RESULTS

216,730 kWh per Year *

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Energy Value ($)
January	2.78	12,800	1,920
February	3.52	14,482	2,172
March	4.34	19,256	2,888
April	4.95	20,511	3,077
May	5.69	23,671	3,551
June	5.86	22,991	3,449
July	5.73	22,949	3,442
August	5.47	21,720	3,258
September	4.91	19,401	2,910
October	3.99	16,852	2,528
November	2.68	11,450	1,717
December	2.35	10,648	1,597
Annual	4.36	216,731	$ 32,509

Location and Station Identification

Requested Location	300 carteret Avenue, carteret, NJ
Weather Data Source	(TMY2) NEWARK, NJ 9.7 mi
Latitude	40.7° N
Longitude	74.17° W

PV System Specifications *(Commercial)*

DC System Size	170 kW
Module Type	Standard
Array Type	Fixed (open rack)
Array Tilt	20°
Array Azimuth	180°
System Losses	14%
Inverter Efficiency	96%
DC to AC Size Ratio	1.1

Initial Economic Comparison

Average Cost of Electricity Purchased from Utility	0.15 $/kWh
Initial Cost	4.00 $/Wdc
Cost of Electricity Generated by System	0.19 $/kWh

Selected Incentives

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

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

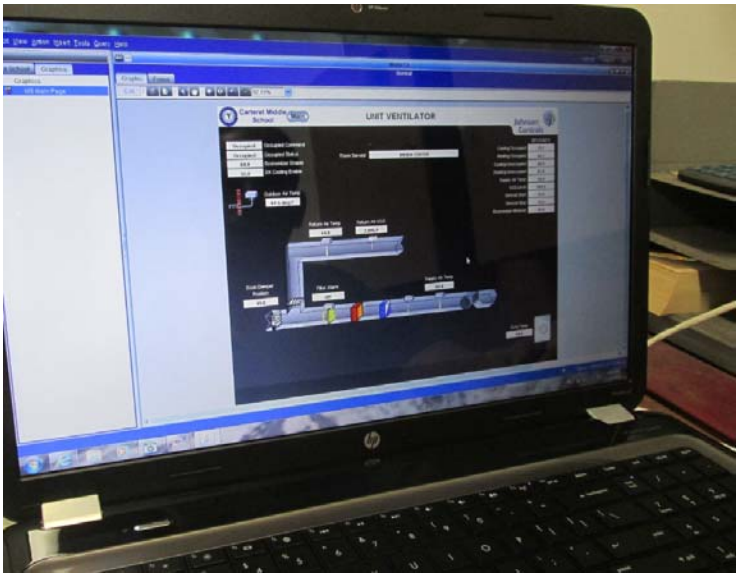
APPENDIX F

Photos

1: Carteret Middle School

2: Burnham cast iron sectional boilers

2: Aerdale heating, cooling, & ventilating unit



4: Siemans DDC temperature controls screen

5: Typical Friedrich window A/C unit

APPENDIX G

EPA Benchmarking Report

ENERGY STAR® Statement of Energy Performance

79

ENERGY STAR® Score[1]

Carteret Middle School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 100,000
Built: 1962

For Year Ending: April 30, 2015
Date Generated: June 05, 2015

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Carteret Middle School 300 Carteret Ave Carteret, New Jersey 07008	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4439840

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
46.9 kBtu/ft²

Source EUI
102.8 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	2,136,493 (46%)
Electric - Grid (kBtu)	2,558,318 (54%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	63.4
National Median Source EUI (kBtu/ft²)	138.7
% Diff from National Median Source EUI	-26%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	456

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)