

RIDGEWOOD BOARD OF EDUCATION

WILLARD ELEMENTARY SCHOOL

601 Morningside Road, Ridgewood NJ 07450

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

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CHA PROJECT NO. 30237

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REPORT DISCLAIMER

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

A thorough walkthrough of the 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 Ridgewood Board of Education 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 energy conservations measures (ECMs) have also been 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
Willard Elementary School	601 Morningside Road, Ridgewood NJ 07450	58,947	1927,1952,1966, and 2012

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)
Willard Elementary School	115,618	1,559	\$19,249	15.2

Each individual measure's annual savings are dependent on that measure alone, there are no interactive effects calculated. There are three options shown for lighting ECM savings; only one option can be chosen. The 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 further 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 chooses 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. This decision is generally based on the need to replace the piece(s) of equipment due to its age, such as a boiler.

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

Summary of Energy Conservation Measures

ECM #	Energy Conservation Measure	Est. Costs (\$)	Est. Savings (\$/year)	Payback w/o Incentive	Potential Incentive (\$)*	Payback w/ Incentive	Recommended
ECM-1A	Convert the Steam System to Hot Water System	1,646,025	4,782	344.2	4,500	343.2	N
ECM-1B	Boiler Replacement	133,153	1,328	100.2	4,500	96.8	Y
ECM-2	Replace Pneumatic Control Devices with DDC Devices	153,428	1,245	123.2	0	123.2	N
ECM-3	Install Window AC Controller	6,200	1,525	4.1	0	4.1	Y
ECM-4	DHW Heater Replacement	14,280	426	33.5	2,040	28.7	N
ECM-L1**	Lighting Replacements / Upgrades	144,534	15,708	9.2	4,495	8.9	N
ECM-L2**	Install Lighting Controls (Add Occupancy Sensors)	8,208	1,245	6.6	1,280	5.6	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	152,742	16,396	9.3	5,775	9.0	Y
Total**		2,105,827	25,703	81.9	16,815	81.3	
Total(Recommended)		292,095	19,249	15.2	10,275	14.6	

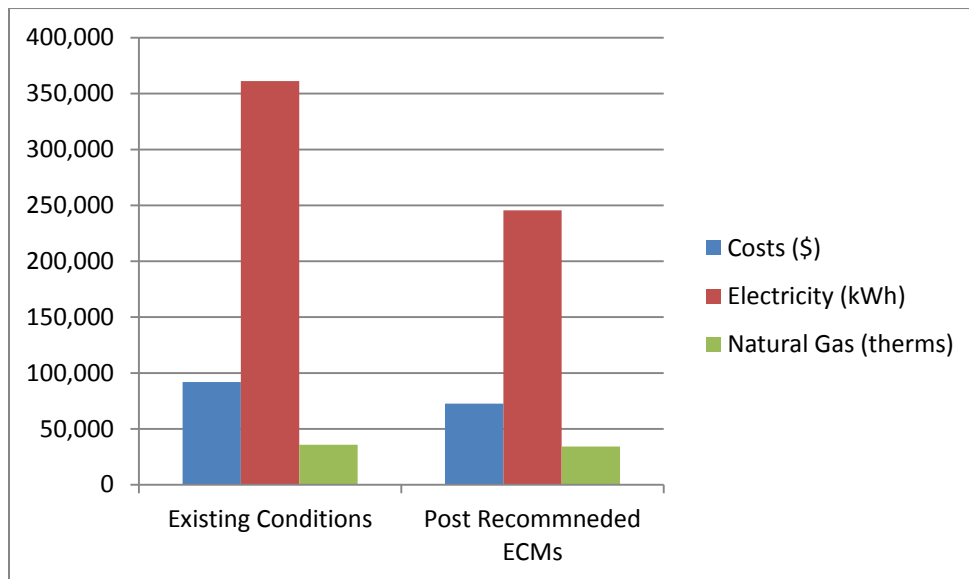
* Incentive shown is per the New Jersey SmartStart Program.

** These ECMs are not included in the Total, as they are alternate measures not recommended.

By implementing the recommended ECMs, the building could result in a total of 57 metric tons of greenhouse gas (GHG) reduction.

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs (\$)	91,903	72,654	21%
Electricity (kWh)	361,169	245,551	32%
Natural Gas (therms)	35,837	34,278	4%
Site EUI (kbtu/SF/Yr)	81.7	72.4	



2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

The following is a summary of the building information related to HVAC, plumbing, building envelope, lighting, kitchen equipment and domestic hot water systems as observed during CHA's 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: Willard Elementary School
Address: 601 Morningside Road, Ridgewood NJ 07450
Gross Floor Area: 58,947
Number of Floors: Two floors and one basement
Year Built: 1927, 1952, 1966 and 2012



Building Envelope

Description of Spaces: This is an academic and office building which has office rooms, classrooms, auditoriums, gymnasiums, cafeterias, computer labs, restrooms and mechanical rooms.

Description of Occupancy: The facility serves about 500 students from kindergarten to grade 5. There are also about 30 school faculty and staff members.

Number of Computers: The building has approximately 100 desktop and laptop computers.

Building Usage: The building's office hours are typically from 7:30AM to 3:30PM during school year; however, there are also some after school activities during the school year.

Construction Materials: Concrete Masonry Unit (CMU) and brick façade.

Roof: The building has a combination of sloped roof and flat roof which is covered with a grey rubber membrane. The roof has been recently renovated and is believed to be well insulated. The roof is in good condition and no ECMs associated with roof replacement were evaluated.

Windows: The windows throughout the building are double pane aluminum framed windows. The windows are in good condition and no ECMs associated with window replacement were evaluated.

Exterior Doors: The exterior doors throughout the school are alumina frame with double pane safety glass. The sweeps on the exterior doors are still in good condition. Therefore, no ECMs associated with exterior doors were evaluated.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: This building is heated by two Weil McLain steam boilers located in the basement mechanical room. Each of the boilers has a rated energy input of 2,713MBH and output of 2,176 MBH; which results in a nameplate efficiency of 80%. Condensate is returned to the boilers by using by a condensate tank which is equipped with two condensate return pumps. The boiler is producing 3 psig steam for heating and the stream traps appear to have no leaking issues according to the facility staff. However, it is suggested that the school do the steam trap survey periodically to ensure the steam system is operating efficiently. The steam is used in unit ventilators (UV) and baseboard fin-tube heaters in the old section of the building. There is a steam-to-hot water heat exchanger in the basement mechanical room. The heat exchanger produces heating hot water for two heating hot water loops. Each of the loops are circulated by two 1/2HP pumps; apart from the central heating system, there are five air handling units (AHU) or roof top units (RTU) equipped with gas fired furnace to heat the basement, auditorium and classrooms in the 2012 addition. The details of these units are listed in the cooling section.

Cooling: This building does not have a central chilled water cooling system. Large spaces such as auditoriums are cooled by AHUs/RTUs equipped with direct expansion (DX) cooling units. The details of these AHUs/RTUs are listed in the table below:

Name	No.	Manufacturer	Capacities	Location	Serving Area
AHU-Basement	1	Trane	12.5 ton cooling capacity and 100 MBH energy input, 81 MBH energy output	Ground	Basement
AHU-Auditorium	2	McQuay	30 ton cooling capacity and 400 MBH energy input, 320 MBH energy output	Attic and Roof (Condensing Unit)	Auditorium
RTU-New Section	2	AOON	15 ton cooling capacity and 292.5 MBH energy input, 234 MBH energy output	Roof	Classrooms in the New Section

Besides the roof top units, the building also has a 1.5 ton Daikin split heat pump unit and many window AC units used to cool offices and classrooms. These units appear to be in good condition.

An ECM associated with converting the central steam heating system to hot water system has been evaluated.

Ventilation: Each of the AHUs/RTUs has air intake to provide fresh air for the areas it serves. The amount of the outdoor air that is provided for ventilation is unknown due to the missing drawings/documents; however, it is believed that each unit provides minimum ventilation rate based on the discussions with school staff. Each classroom has an UV to provide minimum ventilation for the classrooms. The ventilation rate is minimum and therefore no ECM associated with ventilation system were evaluated.

Exhaust: This building has multiple fractional HP exhaust fans serving restrooms and general exhaust all located on the roof. The fans are enclosed and therefore the capacities of fan motors are unknown, however, the exhaust fan covers appear to be in good condition. Therefore, no ECM related to the exhaust system.

Controls Systems

This building has a hybrid control system which consists of an Automated Logic direct digital control (DDC) board and pneumatic control devices. The compressed air of the pneumatic control devices are provided by an Ingersoll Rand air compressor powered by two 2HP motors. The pneumatic control signals were converted to electronic/digital signals by using transducers. The control system is monitored and maintained by Energy for America. According to the Energy for America operation manual, the cooling season occupied temperature is typically set between 74°F and 78°F and the unoccupied temperature is set at 85°F. The heating season occupied temperature is typically set between 68°F and 72°F and the unoccupied temperature is set at 55°F. During the site visit, it was noted that there are some leaks in the pneumatic control system; therefore, an ECM related to replace the pneumatic devices with digital control devices has been included.

Domestic Hot Water Systems

This building has one A.O.Smith natural gas fired domestic hot water (DHW) heater, which has a rated energy input of 120MBH. There is also an electric domestic hot water heater for the two classrooms in the new addition. This electric heater has a rated 1.65kW heating capacity. This electric heater is located in the classroom closet which has no space for gas piping; therefore, an ECM related to replacing the gas fired heater with gas fired condensing hot water heater has been evaluated.

Kitchen Equipment

There is no kitchen in this building.

Plug Load

This building has computers, monitors, residential appliances (microwave, refrigerator, etc.), and printers which contribute to the plug load in the building. The appliances are turned off during unoccupied hours; therefore, no ECMs associated with plug load were evaluated. However, replacing the appliances with Energy Star rated appliances when the old ones reach the end of its useful life span is included as an O&M.

Plumbing Systems

This building has plumbing fixtures which appear to be low volume plumbing fixtures and waterless urinals. The sink faucets appear to have low-flow type aerators; therefore, no ECMs associated with plumbing systems were evaluated.

Lighting Systems

The building has a mixture of 32W T-8 fluorescent lighting, CFLs lights, metal halide and incandescent lights. The majority of lighting fixtures are T-8 fluorescent linear fixtures. The gymnasium has 16 400W metal halides. The majority of the lights are controlled by manual switches. We have provided three alternatives for lighting that include adding occupancy sensors to the existing lights, replacing the lights with LED lights and a third ECM that evaluates adding occupancy sensors to the proposed LED lights.

3.0 UTILITIES

Natural gas and electricity are separately metered into this building. Utilities used by the building are delivered and supplied by the following utility companies:

	Electric	Natural Gas	Water
Deliverer	PSE&G	PSE&G	Ridgewood Water
Supplier	Direct Energy	Direct Energy/ South Jersey Energy/ PSE&G	N/A

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

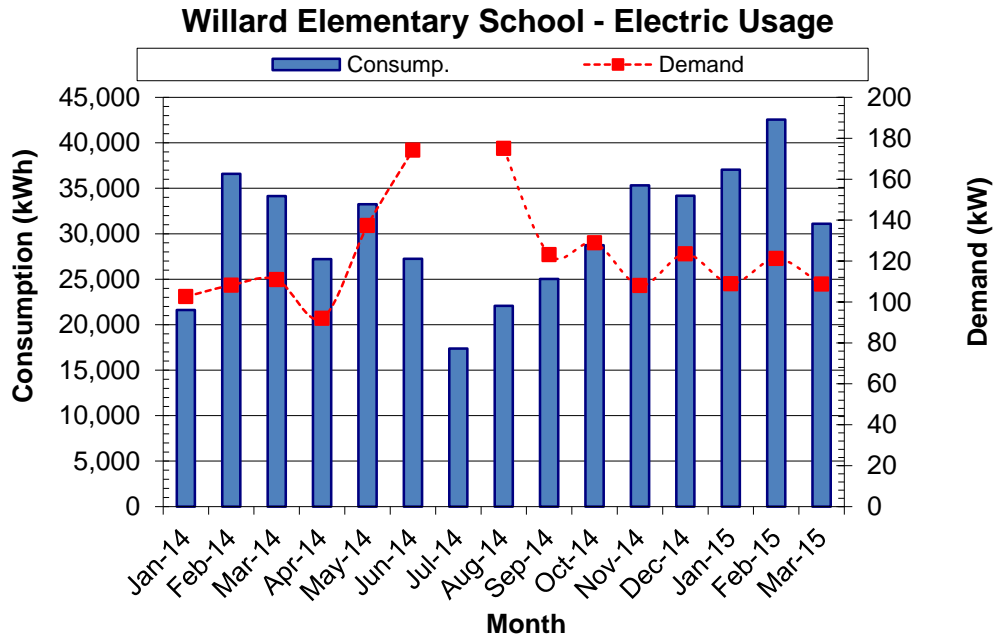
Electric		
Annual Usage	361,169	kWh/yr
Annual Cost	56,066	\$
Blended Rate	0.155	\$/kWh
Peak Demand	175.0	kW
Min. Demand	92.0	kW
Avg. Demand	123.0	kW
Natural Gas		
Annual Usage	35,837	Therms/yr
Annual Cost	30,535	\$
Rate	0.852	\$/therm
Water		
Annual Usage	855,000	Gallons
Annual Cost	6,461	\$
Rate	0.008	\$/Gallon

Blended Rate: Average rate charged determined by the annual cost / annual usage

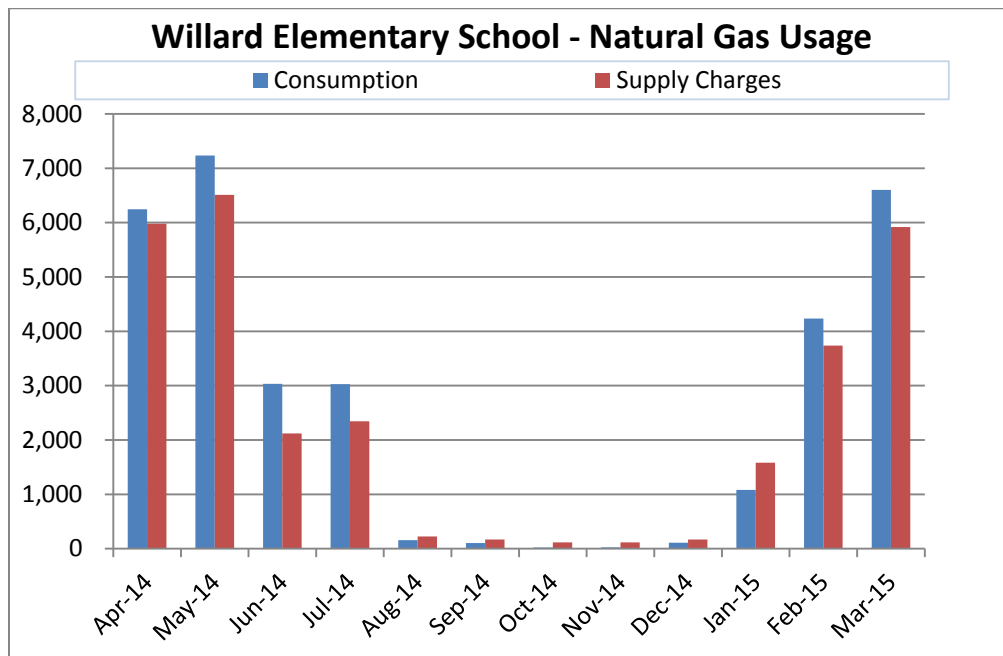
Supply Rate: Actual rate charged for electricity usage in kWh (based on most recent electric bill)

Demand Rate: Rate charged for actual electrical demand in kW (based on most recent electric bill)

*Some months that do not have utility data and the missing demand usage are estimated and highlighted in the utility spreadsheet



The electric usage is pretty consistent throughout the year and varies with the usage of the building. In the summer months, the electric usage is lower than other months due to decreased building usage.



The natural gas usage in this building is for heating and DHW production, and therefore the usage in summer months is relatively small compared with heating months. The gas usage during the heating season is correlated to winter weather conditions.

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	School Average Rate	NJ Average Rate	
Electricity	\$/kWh	\$0.155	\$0.13	Y
Natural Gas	\$/Therm	\$0.852	\$0.96	N

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

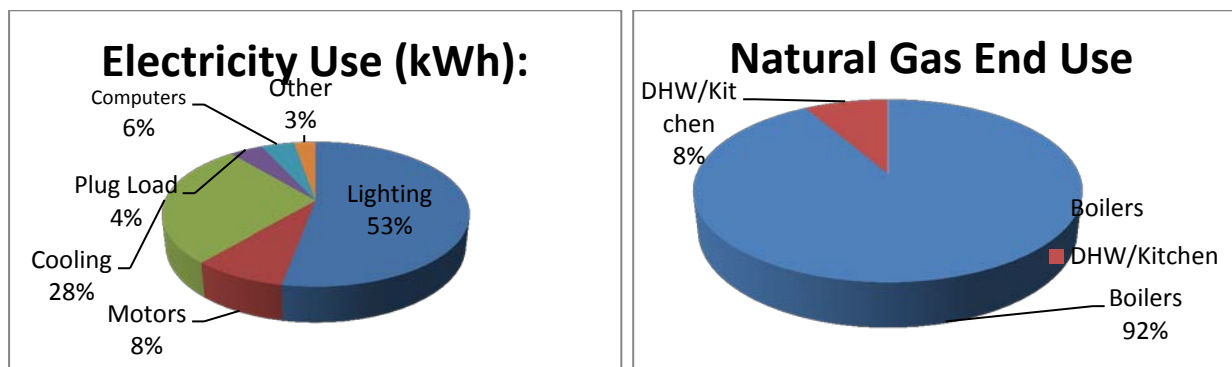
Additional information on selecting a third party energy supplier is available here:

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

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

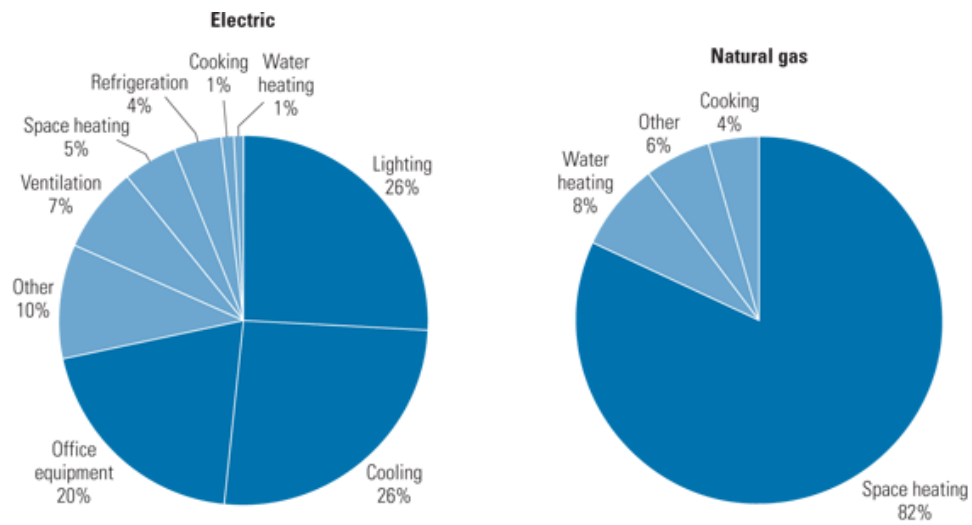
The charts below represent estimated end-use utility profiles for the building. The values used within the charts were estimated from a review of the utility analysis and the energy savings calculations.

Site End-Use Utility Profile



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

Typical End-Use Utility Profile for Educational Facilities



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

4.0 BENCHMARKING

The EPA Portfolio Manager benchmarking tool provides a site and source Energy Use Intensity (EUI), as well as, an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft²/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100; with 100 being the most efficient. In order for a building to receive an Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed measures, the Energy Star rating will increase. However, the EPA does not have scores for all buildings types. The buildings that do not have energy ratings now are compared with national median EUI.

The sites EUI is the amount of heat and electricity consumed by a building as reflected in its 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 provides an equivalent measure for various types of buildings with differing energy sources. The results of the benchmarking is contained in the table below. Copies of the benchmarking report are available in Appendix G.

Site EUI kBtu/ft ² /yr	Source EUI (kBtu/ft ² /yr)	Energy Star Rating (1-100)
81.7	129.5	53

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

5.0 ENERGY CONSERVATION MEASURES

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

- Energy conservation measures (ECMs) are energy savings recommendations that typically require a financial investment. For these areas of opportunity, CHA prepared detailed calculations, as summarized in this section and in Appendix C. In general, additional savings may exist from reductions in maintenance activities associated with new equipment or better controls; however, for conservatism, maintenance savings are not accounted for in this report; instead the only savings which are reported are those derived directly from reductions in energy which can be tracked by the utility bills.
- Operational and Maintenance measures (O&M) consist of low-cost 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 (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-1A Convert the Steam System to Hot Water System

This ECM evaluates the conversion of the existing natural gas fired steam boilers to high efficiency condensing hot water boilers which will also enable additional savings through hot water temperature reset based on outdoor air temperature.

Steam heating systems are inherently inefficient and high maintenance when compared to re-circulated hot water heating systems or other modern heating systems. As steam systems age, the steam traps fail which then requires more untreated cold make-up water. This in turn requires more chemical treatment and increases the risk of boiler thermal shock. Steam piping becomes fouled with scale and corrosion over time resulting in poor heat transfer and ultimately pipe failure. Steam heating systems use boilers that only operate up to 84% combustion efficiency and have even lower thermal efficiency. Multiple condensate pumps and boiler feed water pumps consume electricity that would not be needed in other modern heating systems.

In lieu of replacing the boilers in kind, this ECM evaluates replacing the steam system in its entirety with a more efficient hot water system, due to the school is interested in hot water system. New modulating condensing gas boilers are available that minimally operate at 88%, and can operate as high as 96%. To implement this ECM, the old steam boilers, distribution piping, venting and terminal units would be removed and the new hot water boilers, distribution piping and primary pumps put in their place. Significant piping and wiring modifications would be needed. New dedicated boiler venting would also need to be installed either through the roof or sidewall. Asbestos abatement may need to be performed prior to any work and the cost for this is not included in the payback analysis.

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

ECM-1A Convert the Steam System to Hot Water System

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
1,646,025	0	0	5,613	4,782	(0.9)	4,500	344.2	343.2

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

This measure is not recommended due to the long payback period.

5.2 ECM-1B Replace steam boiler

The existing steam boilers are more than 30 years old and beyond the ASHRAE useful life span. Therefore, it is suggested a new steam boiler be installed to run as the main boiler for the heating system. This ECM assesses the replacement of the boiler with the similar size steam boiler which will provide the same amount heating for the building.

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

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

ECM-1B Replace steam boiler

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
133,153	0	0	1,559	1,328	(0.7)	4,500	100.2	96.8

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

This measure is recommended since the existing boiler is beyond their useful lifespan.

5.3 ECM-2 Replace Pneumatic Control Devices with DDC Devices

This building has a hybrid control system which consists of an Automated Logic direct digital control (DDC) broad and pneumatic control devices. The compressed air of the pneumatic control devices are provided by an Ingersoll Rand air compressor powered by two 2HP motors. The pneumatic control signals were converted to electronic/digital signals by using transducers. The control system is monitored and maintained by Energy for America. According to the Energy for America operation manual, the cooling season occupied temperature is typically set between 74°F and 78°F and the unoccupied temperature is set at 85°F. The heating season occupied temperature is typically set between 68°F and 72°F and the unoccupied temperature is set at 55 °F. During the site visit, it was noted that the facility has not conducted a compressed air survey for a long time and a few air leaks were identified; therefore, it is recommended that the school convert the pneumatic devices to digital control devices to eliminate the air leaks as well as provide more accurate temperature control.

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

ECM-2 Replace Pneumatic Control Devices with DDC Devices

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
153,428	0	6,228	328	1,245	(0.8)	0	123.2	123.2

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

This measure is not recommended due to the long payback period.

5.4 ECM-3 Install Window AC Controllers

There are about 30 window A/C units which on occasion, are left on by the occupants when they leave the room.

This ECM evaluates the installation of programmable “smart” timers that interrupt the electrical supply to the window air conditioners when the room is 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-3 Install Window A/C Units Controller

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
6,200	0	9,838	0	1,525	2.7	0	4.1	4.1

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

This measure is recommended.

5.5 ECM-4 Replace Domestic Hot Water Heaters with Condensing DHW Heater

This building has one A.O.Smith natural gas fired domestic hot water (DHW) heater which has rated energy input of 120MBH. This heater provides domestic hot water for the entire building except two classrooms. It is suggested that a high efficiency condensing DHW heater be installed to replace the existing one.

The gas fired heater has efficiency in the range of 80%. It is suggested to replace this heater with a gas fired condensing heater. The energy savings could be realized by replacing the heater with one high efficiency condensing gas fired heater, which can operate at efficiencies up to 96% and have less standby energy loss from the storage tank.

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

ECM-4 Replace Domestic Hot Water Heaters with 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
14,280	0	0	500	426	(0.6)	2,040	33.5	28.7

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

This measure is not recommended due to the long payback period.

5.6.1 ECM-L1 Lighting Replacement / Upgrades

The existing lighting system consists of mostly 32 watt T8 linear fluorescent fixtures which until recently represented the most efficient lighting technology available. Recent technological improvements in light emitting diode (LED) technologies have driven down the initial costs making it a viable option for installation.

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
144,534	30	101,344	0	15,708	0.6	4,495	9.2	8.9

* LED new fixtures are still qualified for prescribed incentives, however, LED retrofits must go through the custom incentive which is not calculated in LGEA study therefore, the potential incentive shown in the table is the possible prescribed incentive.

This measure is not recommended in lieu of ECM L3.

5.6.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

Presently, this building has a central lighting control system which turns off all the lights except safety lights at midnight and turn on the lights at 7:00AM. The timer system overrides the switches. A 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 ECM-L1, 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
8,208	0	8,034	0	1,245	1.3	1,280	6.6	5.6

* 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.

5.6.3 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. The 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
152,742	30	105,780	0	16,396	0.6	5,775	9.3	9.0

* LED new fixtures are still qualified for prescribed incentives, however, LED retrofits must go through the custom incentive which is not calculated in LGEA study therefore, the potential incentive shown in the table is the possible prescribed incentive.

This measure is recommended.

5.7 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:

- Purchase ENERGY STAR® appliances when needed
- Cover window AC units during winter season

6.0 PROJECT INCENTIVES

6.1 Incentives Overview

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

6.1.1 New Jersey Smart Start Program

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

- Electric Chillers
- Gas Chillers
- Gas Heating
- Unitary HVAC
- Ground Source Heat Pumps
- Variable Frequency Drives/Motors
- Refrigeration
- Prescriptive and Performance Lighting and Lighting Controls

The equipment is procured using a typical bid-build method. It is then installed, 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 was 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 more 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 school district has solar photovoltaic (PV) panels study done on the school district buildings. This building has a mixture of pitched roof and small portion flat roof which was determined to be not suitable for installing PV solar panels; therefore, no rooftop solar PV system is included.

7.1.2 Solar Thermal Hot Water Generation

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

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

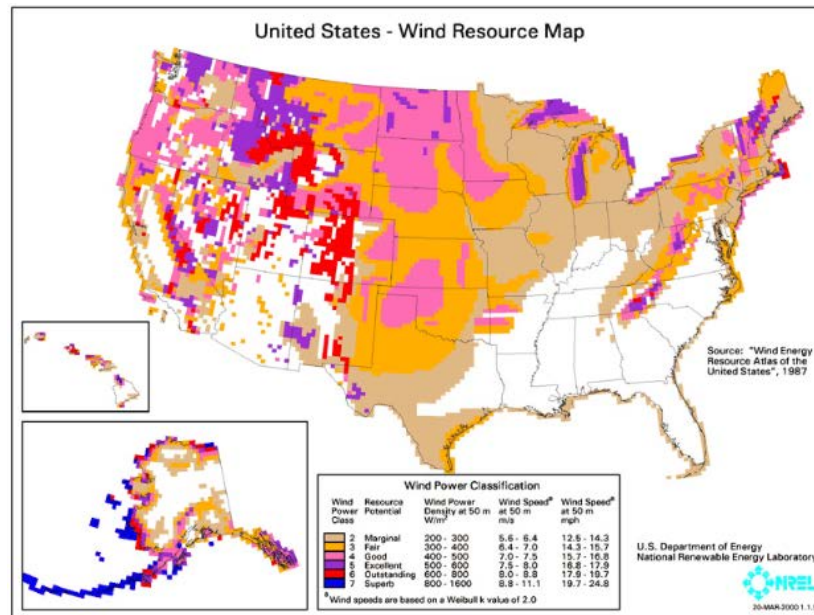
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping).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

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

7.2 Wind Powered Turbines

Wind power is the conversion of kinetic energy from wind into mechanical power that is used to drive a generator which creates electricity by means of a wind turbine. A wind turbine consists of rotor and blades connected to a gearbox and generator that are mounted onto a tower. Newer wind turbines also use advanced technology to generate electricity at a variety of frequencies depending on the wind speed, convert it to DC and then back to AC before sending it to the grid. Wind turbines range from 50 – 750 kW for utility scale turbines down to below 50 kW for residential use. On a scale of 1 (the

lowest) to 7 (the highest), Class 3 and above (wind speeds of 13 mph or greater) are generally considered “good wind resource” according to the Wind Energy Development Programmatic EIS Information Center hosted by the Bureau of Land Management. According to the map below, published by NREL, Newark, NJ is classified as Class 1 at 50m, meaning the city would not be a good candidate for wind power.



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

7.3 Combined Heat and Power Plant

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

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. This 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. However, a mini-size CHP could be an option for the school to consider. The sizing and energy savings of the mini-size CHP require further study.

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 the 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 June 2014 the following table summarizes the electricity load profile for the building.

Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
175.0	92.0	123.0	N	Y

*the demand is estimated from one month bill

This measure is not recommended due to the lack of enough onsite generation.

8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for the Willard Elementary School.

The following projects should be considered for implementation:

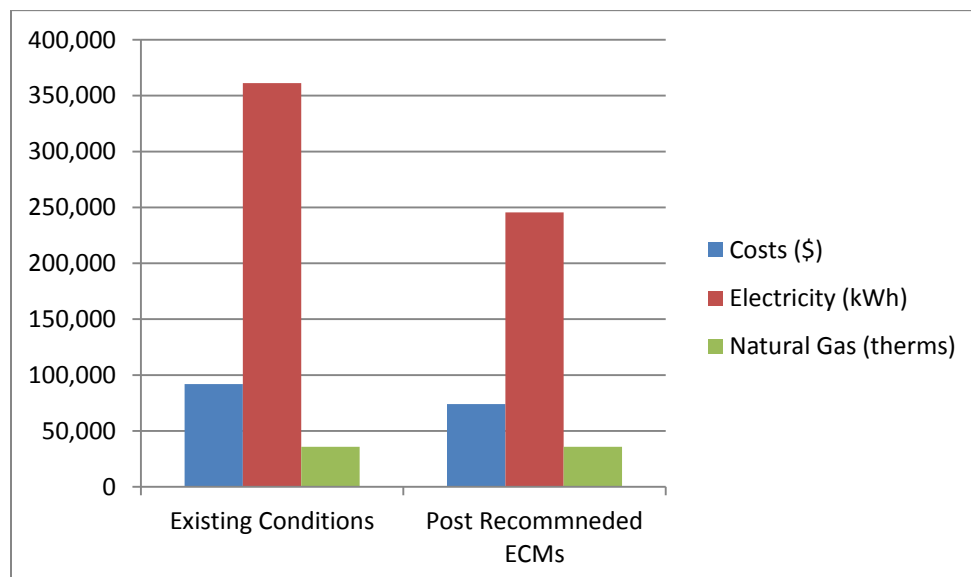
- Install Window AC Controller
- Lighting Replacements / Upgrades

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)
115,618	1,559	\$19,249	15.2

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs (\$)	91,903	72,654	21%
Electricity (kWh)	361,169	245,551	32%
Natural Gas (therms)	35,837	34,278	4%
Site EUI (kbtu/SF/Yr)	81.7	72.4	



Next Steps: This energy audit has identified several areas of potential energy savings. Ridgewood Board Of Education can use this information to pursue incentives offered by the NJBPU's NJ Clean Energy Program. Additional meetings will be scheduled with school staff members to review possible options.

APPENDIX A

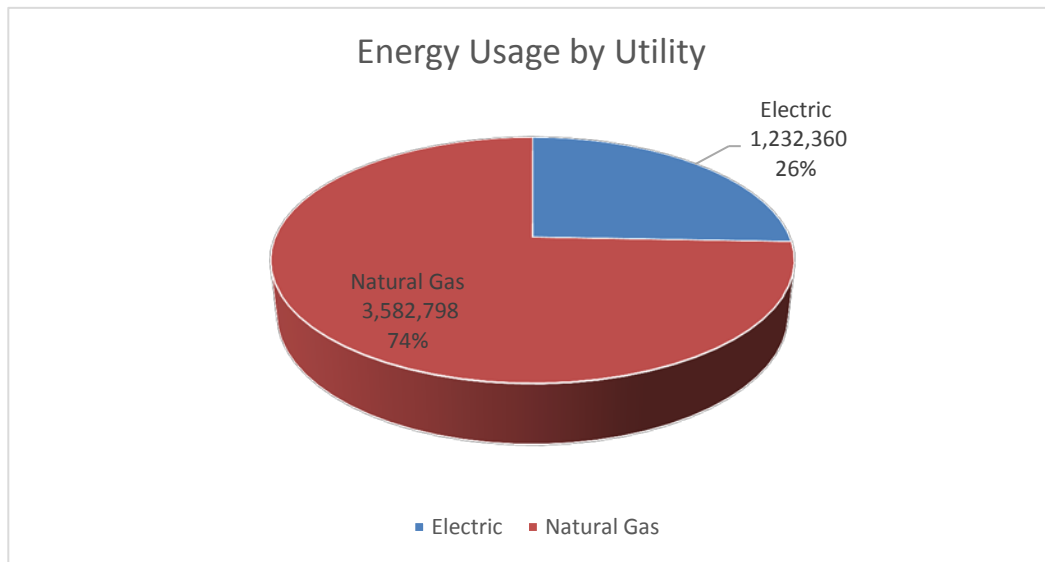
Utility Usage Analysis and Alternate Utility Suppliers

Ridgewood BOE NJBPU LGEA
Willard Elementary School
601 Morningside Rd. Ridgewood, NJ

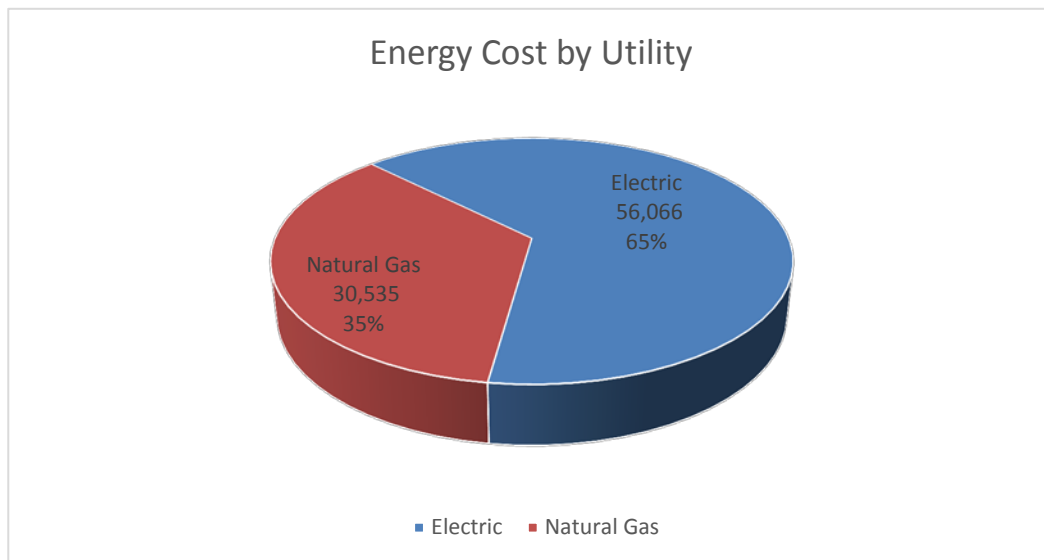
Annual Utilities
12-month Summary

Electric		
Annual Usage	361,169	kWh/yr
Annual Cost	56,066	\$
Blended Rate	0.155	\$/kWh
Peak Demand	175.0	kW
Min. Demand	92.0	kW
Avg. Demand	123.0	kW
Natural Gas		
Annual Usage	35,837	Therms/yr
Annual Cost	30,535	\$
Rate	0.852	\$/therm
Water		
Annual Usage	855,000	Gallons
Annual Cost	6,461	\$
Rate	0.008	\$/Gallon
Energy Summary		
Building Area	58,947	SF
Energy Usage Intensity (EUI)	82	KBtu/SF/yr
Energy Cost Index (ECI)	1.58	\$/SF/yr
Total Annual Utility Costs	93,062	\$

Utility	KBtu	%
Electric	1,232,360	26%
Natural Gas	3,582,798	74%
	4,815,158	100%



Utility	\$	%
Electric	56,066	65%
Natural Gas	30,535	35%
	86,600	100%



Ridgewood BOE NJBPU LGEA
 Willard Elementary School
 601 Morningside Rd. Ridgewood, NJ

Electric Service

For Service at: 601 Morningside Rd. Ridgewood, NJ

Account No.: 0

Meter No.:

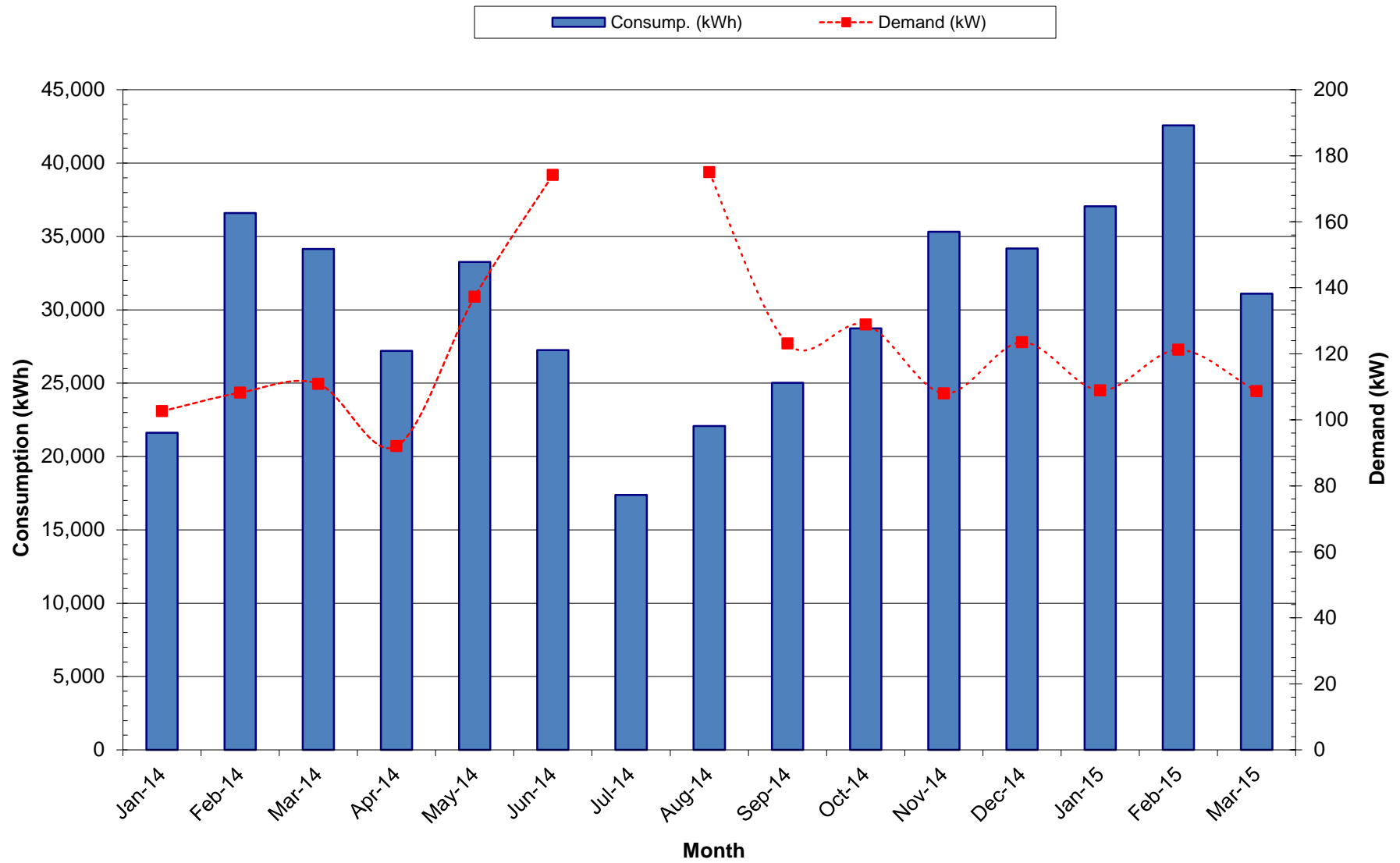
Delivery: PSE&G

Supply: Energy Direct

Month			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs				
	Consump. (kWh)	Demand (kW)	Delivery (\$)	Supplier (\$)	Total (\$)	Consumption (\$)	Demand (\$)	Delivery (\$/kWh)	Supplier (\$/kWh)	Consumption Rate (\$/kWh)	Demand (\$/kW)	Blended Rate (\$/kWh)
January-14	21,618	102.60	3,200.65		3,200.65	3200.65		0.148	0.000	0.148	0.000	0.148
February-14	36,595	108.20	5,432.35		5,432.35	5432.35		0.148	0.000	0.148	0.000	0.148
March-14	34,138	110.90	5,304.36		5,304.36	5304.36		0.155	0.000	0.155	0.000	0.155
April-14	27,206	92.00	4,422.57		4,422.57	4422.57		0.163	0.000	0.163	0.000	0.163
May-14	33,252	137.30	6,169.99		6,169.99	6169.99		0.186	0.000	0.186	0.000	0.186
June-14	27,253	174.20	5,719.09		5,719.09	5719.09		0.210	0.000	0.210	0.000	0.210
July-14	17,384		3,848.24		3,848.24	3848.24		0.221	0.000	0.221	#DIV/0!	0.221
August-14	22,084	175.00	4,889.65		4,889.65	4889.65		0.221	0.000	0.221	0.000	0.221
September-14	25,028	123.10	3,876.29		3,876.29	3876.29		0.155	0.000	0.155	0.000	0.155
October-14	28,740	128.90	4,093.46		4,093.46	4093.46		0.142	0.000	0.142	0.000	0.142
November-14	35,327	108.00	4,679.62		4,679.62	4679.62		0.132	0.000	0.132	0.000	0.132
December-14	34,184	123.50	4,425.65		4,425.65	4425.65		0.129	0.000	0.129	0.000	0.129
January-15	37,050	108.90	4,554.00		4,554.00	4554.00		0.123	0.000	0.123	0.000	0.123
February-15	42,563	121.20	5,180.00		5,180.00	5180.00		0.12	0.00	0.12	0.00	0.12
March-15	31,098	108.70	4,207.00		4,207.00	4207.00		0.135	0.000	0.135	0.000	0.135
Total (All)	453,520	175.00	\$70,002.92	\$0.00	\$70,002.92	\$70,002.92	\$0.00	\$0.15	\$0.00	\$0.15	\$0.00	\$0.15
Total (last 12-months)	361,169	175.00	\$56,065.56	\$0.00	\$56,065.56	\$56,065.56	\$0.00	\$0.155	\$0.00	\$0.16	\$0.00	\$0.16
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)

Carteret Middle School - Electric Usage



**Ridgewood BOE NJBPU LGEA
Willard Elementary School
601 Morningside Rd. Ridgewood, NJ**

Natural Gas Service

For Service at: 601 Morningside Rd. Ridgewood, NJ

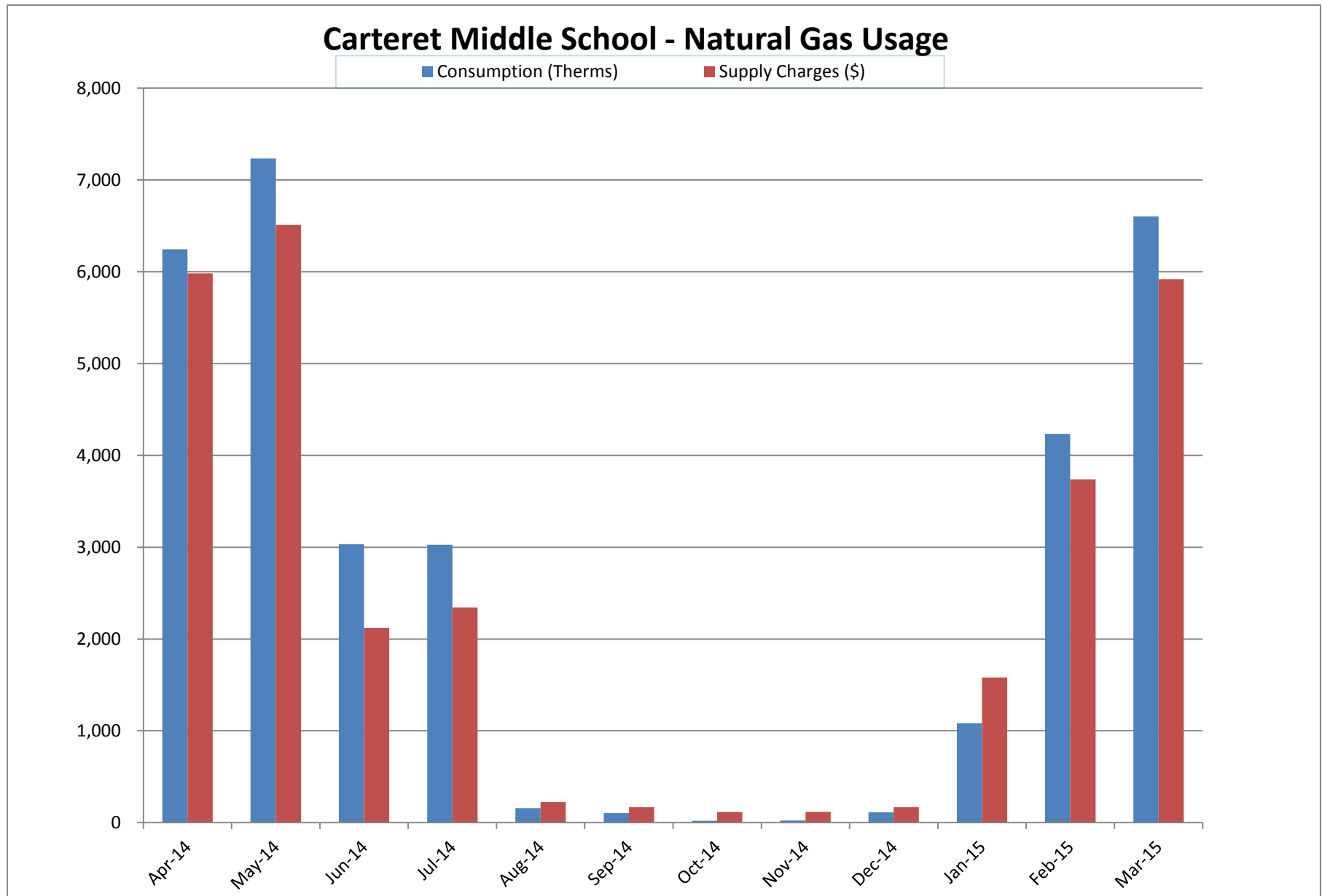
Account No.: 0

Meter No:

Delivery: PSE&G

Supply: Direct Energy/South Jersey Energy/PSE&G

Month	Consumption (Therms)	Delivery Charges (\$)	Supply Charges (\$)	Total Charges (\$)	Rate (\$/Therm)
January-14	6,245.18	5,981.88		5,981.88	0.96
February-14	7,233.85	6,511.37		6,511.37	0.90
March-14	3,032.90	2,120.26		2,120.26	0.70
April-14	3,028.21	2,344.06		2,344.06	0.77
May-14	156.79	223.45		223.45	1.43
June-14	104.00	168.70		168.70	1.62
July-14	21.00	115.16		115.16	5.48
August-14	23.29	116.80		116.80	5.02
September-14	111.20	167.89		167.89	1.51
October-14	1,081.90	1,580.78		1,580.78	1.46
November-14	4,233.75	3,738.16		3,738.16	0.88
December-14	6,603.40	5,919.76		5,919.76	0.90
January-15	6,603.00	5,920.00		5,920.00	0.90
February-15	9,890.00	7,946.00		7,946.00	0.80
March-15	3,980.00	2,294.00		2,294.00	0.58
Total (12 Months)	35,837	\$ 30,534.76	\$ 30,534.76	\$ 30,534.76	\$ 0.85



Ridgewood BOE NJBPU LGEA
Willard Elementary School
601 Morningside Rd. Ridgewood, NJ

For Service at:

Account No.:

Meter No.:

Water & Sewer Service

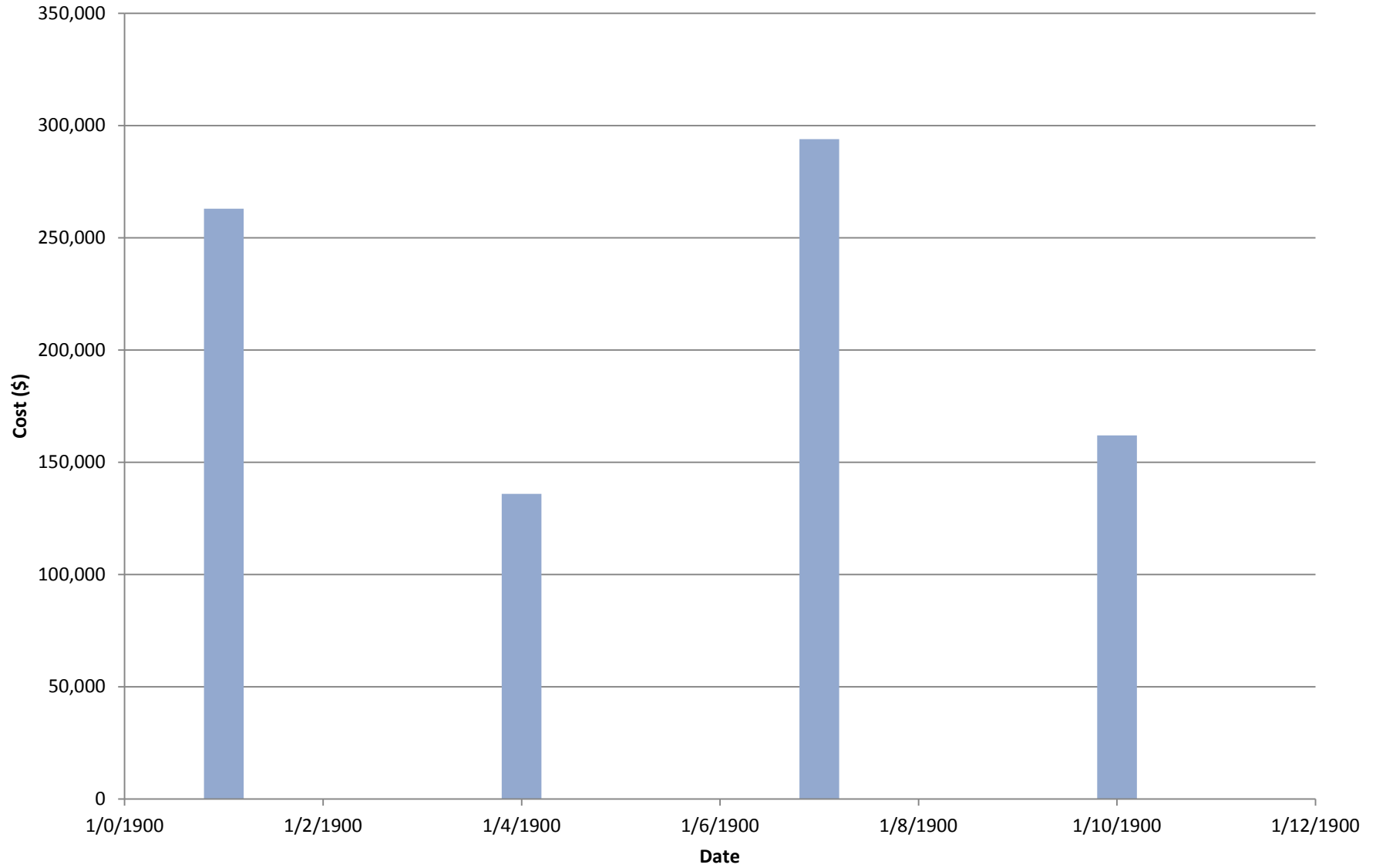
Delivery -
Supplier -

Ridgewood Water

Month	Total (\$)	Gallons	\$/Gallon
March-14	\$ 1,467.41	263,000	\$ 0.01
June-14	\$ 2,387.54	136,000	\$ 0.02
September-14	\$ 1,612.80	294,000	\$ 0.01
December-14	\$ 993.72	162,000	\$ 0.01
Total	\$ 6,461.47	855,000	\$ 0.01

Water Usage

■ Gallons



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 5 th 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, 2 nd 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
Integrus Energy Services, Inc. 33 Wood Ave, South, Suite 610 Iselin, NJ 08830	(800) 536-0151 www.integrusenergy.com	C/I ACTIVE
Jsynergy, LLC 445 Central Ave. Suite 204 Cedarhurst, NY 11516	(516) 331-2020 Jsynergylc.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. 16 th 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.Jsnergylc.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.ppandpu.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

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APPENDIX B

Equipment Inventory

CHA Project # 30237
Willard Elementary School
Ridgewood Public Schools

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
Boiler	2	Weil-McLain	988	3	Steam Boiler	2,713 MBH energy Input and 2,176 MBH energy output	~80% Efficiency	Basement Mechanical Room	Entire Building	1980	-10	
DHW Heater	1	A O Smith	N/A	N/A	Natural Gas DHW heater	120MBH energy input	80% efficiency	Basement Mechanical Room	Entire Building except two classrooms	1980	-10	
DHW Heater	1	State	P6 20 10MS972 K	K98202562	Electric DHW heater	1.65kW		Classroom Closet	Two Classrooms	1999	9	
AHU-Basement	1	Trane	YCH150C3L0BB		AHU equipped with Cooling and Heating	12.5 ton cooling capacity and 100 MBH energy input, 81 MBH energy output	EER of 9.6 and heating efficiency of 81%	Gournd	Basement	1999	9	
AHU-Auditorium	2	McQuay	CAH014GDAC/RCS030DYY	FBOU110800908 00	AHU equipped with McQuay DX Cooling and Sterling Gas Fired Heating	30 ton cooling capacity and 400 MBH energy input, 320 MBH energy output	heating efficiency of 80%	Attic and Roof (Condensing Unit)	Auditorium	2005	10	
RTU-New Section	2	AOON	RN-015-8-0-EA09-3G9	2011111-ANGL19637	RTU equipped with Cooling and Heating	15 ton cooling capacity and 292.5 MBH energy input, 234 MBH energy output	EER of 12 and heating efficiency of 80%	Roof	Classrooms in the New Section	2012	17	

APPENDIX C

ECM Calculations

Energy Audit of Ridgewood Board of Education - Willard Elementary School
CHA Project No.30237

ECM-L1 Lighting Replacements

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$144,534	30.29	101,344	0	\$15,708	0	\$15,708	\$4,495	9.2	8.9

*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)
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$8,208	0.0	8,034	0	\$1,245	0	\$1,245	\$1,280	6.6	5.6

*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)
\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$152,742	30.3	105,780	0	\$16,396	0	\$16,395	\$5,775	9.3	9.0

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Cost of Electricity:

\$0.155 \$/kWh

\$/kW

Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	Usage Describe Usage Type using Operating Hours	No. of Fixtures No. of fixtures before the retrofit	Standard Fixture Code Lighting Fixture Code	EXISTING CONDITIONS						Retrofit Control Retrofit control device	Notes
					Fixture Code Code from Table of Standard Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control Pre-inst. control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/space) * (Annual Hours)		
35LED	Basement - Cafeteria	Cafeteria	25	T 32 R F 3 (ELE)	F43ILL/2	90	2.25	SW	1785	4,016	OCC	
234	Storage	Storage Areas	3	R 75 C I 1	i75/1	75	0.23	SW	2856	643	NONE	
46LED	Storage	Storage Areas	6	W 32 P F 2 (ELE)	F42ILL	59	0.35	SW	2856	1,011	NONE	
46LED	Storage	Storage Areas	6	W 32 P F 2 (ELE)	F42ILL	59	0.35	SW	2856	1,011	NONE	
46LED	Girls' Toilet	Restroom	4	W 32 P F 2 (ELE)	F42ILL	59	0.24	SW	2142	506	OCC	
46LED	Boys' Toilet	Restroom	3	W 32 P F 2 (ELE)	F42ILL	59	0.18	SW	2142	379	OCC	
46LED	Computer Lab	Media Center	8	W 32 P F 2 (ELE)	F42ILL	59	0.47	SW	3825	1,805	OCC	
46LED	Band Room	Classrooms	8	W 32 P F 2 (ELE)	F42ILL	59	0.47	SW	2856	1,348	OCC	
46LED	Storage	Storage Areas	4	W 32 P F 2 (ELE)	F42ILL	59	0.24	SW	2856	674	NONE	
46LED	Room B3	Classrooms	6	W 32 P F 2 (ELE)	F42ILL	59	0.35	SW	2856	1,011	OCC	
196LED	Room B2	Classrooms	12	W 32 C F 4 (ELE)	F44ILL	112	1.34	SW	2856	3,838	OCC	
46LED	Room B2	Classrooms	1	W 32 P F 2 (ELE)	F42ILL	59	0.06	SW	2856	169	OCC	
46LED	Hallways	Hallways	8	W 32 P F 2 (ELE)	F42ILL	59	0.47	SW	8736	4,123	NONE	
196LED	Room B1	Classrooms	12	W 32 C F 4 (ELE)	F44ILL	112	1.34	SW	2856	3,838	OCC	
46LED	Room XXX	Classrooms	2	W 32 P F 2 (ELE)	F42ILL	59	0.12	SW	2856	337	OCC	
46LED	Boiler Room	Boiler Room	5	W 32 P F 2 (ELE)	F42ILL	59	0.30	SW	3825	1,128	NONE	
46LED	Hallways	Hallways	5	W 32 P F 2 (ELE)	F42ILL	59	0.30	SW	8736	2,577	NONE	
46LED	Custodian's Office	Offices	1	W 32 P F 2 (ELE)	F42ILL	59	0.06	SW	3213	190	OCC	
46LED	Crawl Space	Linen/Utility/Wet/Janitor/Electrical	2	W 32 P F 2 (ELE)	F42ILL	59	0.12	SW	1000	118	NONE	
246	Storage	Storage Areas	1	W96CF1 (MAG)	F81EHS	83	0.08	SW	2856	237	NONE	
246	Storage	Storage Areas	1	W96CF1 (MAG)	F81EHS	83	0.08	SW	2856	237	NONE	
35LED	1st Floor - Room 118	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	SW	2856	3,084	OCC	
20LED	Room 118	Classrooms	2	S 28 P F 1 (ELE)	F41ILL	31	0.06	SW	2856	177	OCC	
20LED	Room 118 Closet	Storage Areas	1	S 28 P F 1 (ELE)	F41ILL	31	0.03	SW	2856	89	NONE	
35LED	Room 119	Classrooms	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.08	SW	2856	3,084	OCC	
20LED	Room 119	Classrooms	2	S 28 P F 1 (ELE)	F41ILL	31	0.06	SW	2856	177	OCC	
20LED	Room 119 Closet	Storage Areas	1	S 28 P F 1 (ELE)	F41ILL	31	0.03	SW	2856	89	NONE	
46LED	Room 117	Classrooms	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	2856	2,528	OCC	
46LED	Room 116	Classrooms	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	2856	2,528	OCC	
46LED	Room 115	Classrooms	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	2856	2,528	OCC	
46LED	Room 114	Classrooms	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	2856	2,528	OCC	
46LED	Room 113	Classrooms	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	2856	2,528	OCC	
46LED	Room 120	Classrooms	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	2856	2,528	OCC	
46LED	Room 121	Classrooms	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	2856	2,528	OCC	
46LED	Room 122	Classrooms	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	2856	2,528	OCC	
46LED	Corridor	Hallways	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	8736	7,731	NONE	
196LED	Boys' Toilet	Restroom	3	W 32 C F 4 (ELE)	F44ILL	112	0.34	SW	2142	720	OCC	
196LED	Girls' Toilet	Restroom	3	W 32 C F 4 (ELE)	F44ILL	112	0.34	SW	2142	720	OCC	
5LED	Principal's Office	Offices	5	2T 32 R F 2 (u) (ELE)	FU2ILL	60	0.30	SW	3213	964	OCC	
196LED	Copy Room	Offices	2	W 32 C F 4 (ELE)	F44ILL	112	0.22	SW	3213	720	OCC	
5LED	Main Office	Offices	9	2T 32 R F 2 (u) (ELE)	FU2ILL	60	0.54	SW	3213	1,735	OCC	
46LED	Corridor	Hallways	3	W 32 P F 2 (ELE)	F42ILL	59	0.18	SW	8736	1,546	NONE	
146LED	Gymnasium	Gymnasium	16	High Bay MH 400	MH400/1	458	7.33	SW	3570	26,161	OCC	
46LED	Auditorium	Auditorium	40	W 32 P F 2 (ELE)	F42ILL	59	2.36	SW	3825	9,027	OCC	
46LED	Room 134	Classrooms	22	W 32 P F 2 (ELE)	F42ILL	59	1.30	SW	2856	3,707	OCC	
46LED	Room 133	Classrooms	17	W 32 P F 2 (ELE)	F42ILL	59	1.00	SW	2856	2,865	OCC	
46LED	Office	Offices	2	W 32 P F 2 (ELE)	F42ILL	59	0.12	SW	3213	379	OCC	
46LED	Room 131 - Art Room	Classrooms	16	W 32 P F 2 (ELE)	F42ILL	59	0.94	SW	2856	2,696	OCC	
46LED	Room 111 - Resource	Offices	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	3213	2,275	OCC	
46LED	Corridor	Hallways	2	W 32 P F 2 (ELE)	F42ILL	59	0.12	SW	8736	1,031	NONE	
5LED	Room 112 - Nurse	Patient	9	2T 32 R F 2 (u) (ELE)	FU2ILL	60	0.54	SW	3000	1,620	OCC	
46LED	Room 110	Classrooms	4	W 32 P F 2 (ELE)	F42ILL	59	0.24	SW	2856	674	OCC	
46LED	Room 109	Classrooms	4	W 32 P F 2 (ELE)	F42ILL	59	0.24	SW	2856	674	OCC	
46LED	Room 108	Classrooms	18	W 32 P F 2 (ELE)	F42ILL	59	1.06	SW	2856	3,033	OCC	
46LED	Boys' Toilet	Restroom	3	W 32 P F 2 (ELE)	F42ILL	59	0.18	SW	2142	379	OCC	
46LED	Girls' Toilet	Restroom	3	W 32 P F 2 (ELE)	F42ILL	59	0.18	SW	2142	379	OCC	
46LED	Room 103	Classrooms	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	2856	2,022	OCC	
46LED	Room 104	Classrooms	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	2856	2,022	OCC	
46LED	Room 105	Classrooms	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	2856	2,022	OCC	
46LED	Room 106	Classrooms	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	2856	2,022	OCC	
46LED	Room 107	Classrooms	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	2856	2,022	OCC	
46LED	Room 102	Classrooms	16	W 32 P F 2 (ELE)	F42ILL	59	0.94	SW	2856	2,696	OCC	
46LED	Room 127	Classrooms	18	W 32 P F 2 (ELE)	F42ILL	59	1.06	SW	2856	3,033	OCC	
46LED	Room 129 - Vocal	Classrooms	20	W 32 P F 2 (ELE)	F42ILL	59	1.18	SW	2856	3,370	OCC	
46LED	Room 130	Classrooms	16	W 32 P F 2 (ELE)	F42ILL	59	0.94	SW	2856	2,696	OCC	
46LED	2nd Floor - Teacher's Area	Staff Lounge	5	W 32 P F 2 (ELE)	F42ILL	59	0.30	SW	4284	1,264	OCC	
234	Teacher's Area Storage	Storage Areas	1	R 75 C I 1	i75/1	75	0.08	SW	2856	214	NONE	
234	Teacher's Area Storage	Storage Areas	1	R 75 C I 1	i75/1	75	0.08	SW	2856	214	NONE	
234	Teacher's Area Storage	Storage Areas	1	R 75 C I 1	i75/1	75	0.08	SW	2856	214	NONE	
234	Teacher's Area Storage	Storage Areas	1	R 75 C I 1	i75/1	75	0.08	SW	2856	214	NONE	
234	Teacher's Area Storage	Storage Areas	1	R 75 C I 1	i75/1	75	0.08	SW	2856	214	NONE	
46LED	Room 213	Classrooms	18	W 32 P F 2 (ELE)	F42ILL	59	1.06	SW	2856	3,033	OCC	
46LED	Room 214	Classrooms	18	W 32 P F 2 (ELE)	F42ILL	59	1.06	SW	2856	3,033	OCC	

[illegible]

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	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 R F(U) = 2'x2' Troff 40 w Recess. Floor 2	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	(kWh/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	(kWh/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		
35LED	Basement - Cafeteria	25	T 32 R F 3 (ELE)	F43ILL/2	90	2.3	SW	1785	4,016	25	T 59 R LED	RTLED38	38	1.0	SW	1,785	1,696	2,321	1.3	\$ 359.68	\$ 5,906.25	\$1,250	16.4	12.9		
234	Storage	3	R 75 C 1 I	I75/1	75	0.2	SW	2856	643	3	CF 26	CFQ26H-L	27	0.1	SW	2,856	231	411	0.1	\$ 63.75	\$ 60.75	\$0	1.0	1.0		
46LED	Storage	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	SW	2856	1,011	6	4 R LED Tube	200732x2	30	0.2	SW	2,856	514	497	0.2	\$ 77.03	\$ 980.10	\$0	12.7	12.7		
46LED	Storage	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	SW	2856	1,011	6	4 R LED Tube	200732x2	30	0.2	SW	2,856	514	497	0.2	\$ 77.03	\$ 980.10	\$0	12.7	12.7		
46LED	Girls Toilet	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2142	506	4	4 R LED Tube	200732x2	30	0.1	SW	2,142	257	248	0.1	\$ 38.51	\$ 653.40	\$0	17.0	17.0		
46LED	Boys Toilet	3	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2142	379	3	4 R LED Tube	200732x2	30	0.1	SW	2,142	193	186	0.1	\$ 28.88	\$ 490.05	\$0	17.0	17.0		
46LED	Computer Lab	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	SW	3825	1,805	8	4 R LED Tube	200732x2	30	0.2	SW	3,825	918	887	0.2	\$ 137.55	\$ 1,306.80	\$0	9.5	9.5		
46LED	Band Room	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	SW	2856	1,348	8	4 R LED Tube	200732x2	30	0.2	SW	2,856	685	1027	0.2	\$ 102.70	\$ 1,306.80	\$0	12.7	12.7		
46LED	Storage	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2856	674	4	4 R LED Tube	200732x2	30	0.1	SW	2,856	343	331	0.1	\$ 51.35	\$ 653.40	\$0	12.7	12.7		
46LED	Room B3	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	SW	2856	1,011	6	4 R LED Tube	200732x2	30	0.2	SW	2,856	514	497	0.2	\$ 77.03	\$ 980.10	\$0	12.7	12.7		
196LED	Room B2	12	W 32 C F 4 (ELE)	F44ILL	112	1.3	SW	2856	3,838	12	T 74 R LED	RTLED50	50	0.6	SW	2,856	1,714	2,125	0.7	\$ 329.35	\$ 2,835.00	\$0	8.6	8.6		
46LED	Room B2	1	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	2856	169	1	4 R LED Tube	200732x2	30	0.0	SW	2,856	86	83	0.0	\$ 12.84	\$ 163.35	\$0	12.7	12.7		
46LED	Hallways	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	SW	8736	4,123	8	4 R LED Tube	200732x2	30	0.2	SW	8,736	2,097	2,027	0.2	\$ 314.15	\$ 1,306.80	\$0	4.2	4.2		
196LED	Room B1	12	W 32 C F 4 (ELE)	F44ILL	112	1.3	SW	2856	3,838	12	T 74 R LED	RTLED50	50	0.6	SW	2,856	1,714	2,125	0.7	\$ 329.35	\$ 2,835.00	\$0	8.6	8.6		
46LED	Room XXX	12	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	2856	337	2	4 R LED Tube	200732x2	30	0.1	SW	2,856	171	166	0.1	\$ 25.68	\$ 326.70	\$0	12.7	12.7		
46LED	Boiler Room	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	SW	3825	1,128	5	4 R LED Tube	200732x2	30	0.2	SW	3,825	574	555	0.1	\$ 85.97	\$ 816.75	\$0	9.5	9.5		
46LED	Hallways	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	SW	8736	2,577	5	4 R LED Tube	200732x2	30	0.2	SW	8,736	1,310	1,267	0.1	\$ 196.34	\$ 816.75	\$0	4.2	4.2		
46LED	Custodian's Office	1	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	3213	190	1	4 R LED Tube	200732x2	30	0.0	SW	3,213	93	90	0.0	\$ 14.44	\$ 163.35	\$0	11.3	11.3		
46LED	Crawl Space	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	1000	118	2	4 R LED Tube	200732x2	30	0.1	SW	1,000	60	58	0.1	\$ 8.99	\$ 326.70	\$0	36.3	36.3		
246	Storage	1	W96CF1 (MAG)	F81EHS	83	0.1	SW	2856	237	1	W96CF1 (MAG)	F81EHS	125	0.1	SW	2,856	357	(120)	(0.0)	\$ (18.59)	\$ -	\$0	0.0	0.0		
246	Storage	1	W96CF1 (MAG)	F81EHS	83	0.1	SW	2856	237	1	W96CF1 (MAG)	F81EHS	125	0.1	SW	2,856	357	(120)	(0.0)	\$ (18.59)	\$ -	\$0	0.0	0.0		
35LED	1st Floor - Room 118	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2856	3,084	12	T 59 R LED	RTLED38	38	0.5	SW	2,856	1,302	1,782	0.6	\$ 276.23	\$ 2,835.00	\$600	10.3	8.1		
20LED	Room 118	2	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	2856	177	2	4 R LED Tube	200732x1	15	0.0	SW	2,856	86	91	0.0	\$ 14.17	\$ 290.40	\$10	20.5	19.8		
20LED	Room 118 Closet	1	S 28 P F 1 (ELE)	F41ILL	31	0.0	SW	2856	89	1	4 R LED Tube	200732x1	15	0.0	SW	2,856	43	46	0.0	\$ 7.08	\$ 145.20	\$5	20.5	19.8		
35LED	Room 119	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	SW	2856	3,084	12	T 59 R LED	RTLED38	38	0.5	SW	2,856	1,302	1,782	0.6	\$ 276.23	\$ 2,835.00	\$600	10.3	8.1		
20LED	Room 119	2	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	2856	177	2	4 R LED Tube	200732x1	15	0.0	SW	2,856	86	91	0.0	\$ 14.17	\$ 290.40	\$10	20.5	19.8		
20LED	Room 119 Closet	1	S 28 P F 1 (ELE)	F41ILL	31	0.0	SW	2856	89	1	4 R LED Tube	200732x1	15	0.0	SW	2,856	43	46	0.0	\$ 7.08	\$ 145.20	\$5	20.5	19.8		
46LED	Room 117	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	2856	2,528	15	4 R LED Tube	200732x2	30	0.5	SW	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,450.25	\$0	12.7	12.7		
46LED	Room 116	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	2856	2,528	15	4 R LED Tube	200732x2	30	0.5	SW	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,450.25	\$0	12.7	12.7		
46LED	Room 115	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	2856	2,528	15	4 R LED Tube	200732x2	30	0.5	SW	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,450.25	\$0	12.7	12.7		
46LED	Room 114	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	2856	2,528	15	4 R LED Tube	200732x2	30	0.5	SW	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,450.25	\$0	12.7	12.7		
46LED	Room 113	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	2856	2,528	15	4 R LED Tube	200732x2	30	0.5	SW	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,450.25	\$0	12.7	12.7		
46LED	Room 120	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	2856	2,528	15	4 R LED Tube	200732x2	30	0.5	SW	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,450.25	\$0	12.7	12.7		
46LED	Room 121	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	2856	2,528	15	4 R LED Tube	200732x2	30	0.5	SW	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,450.25	\$0	12.7	12.7		
46LED	Room 122	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	2856	2,528	15	4 R LED Tube	200732x2	30	0.5	SW	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,450.25	\$0	12.7	12.7		
46LED	Corridor	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	8736	7,731	15	4 R LED Tube	200732x2	30	0.5	SW	8,736	3,931	3,600	0.4	\$ 589.02	\$ 2,450.					

		EXISTING CONDITIONS						RETROFIT CONDITIONS				COST & SAVINGS ANALYSIS					
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	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.)	(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
35LED	Basement - Cafeteria	25	T 32 R F 3 (ELE)	F43ILL/2	90	2.3	2.3	OCC	1785	4,016.3	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
234	Storage	3	R 75 C 1 1	i75/1	75	0.2	0.2	NONE	2856	642.6	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
46LED	Storage	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	0.4	NONE	2856	1,011.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
46LED	Storage	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	0.4	NONE	2856	1,011.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
46LED	Girls' Toilet	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	0.2	OCC	1713.6	404.4	101.1	0.0	\$15.67	\$128.25	\$20.00	8.2	6.9
46LED	Boys' Toilet	3	W 32 P F 2 (ELE)	F42ILL	59	0.2	0.2	OCC	1713.6	303.3	75.8	0.0	\$11.75	\$128.25	\$20.00	10.9	9.2
46LED	Computer Lab	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	0.5	OCC	3060	1,444.3	361.1	0.0	\$55.97	\$128.25	\$20.00	2.3	1.9
46LED	Band Room	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	0.5	OCC	2856	1,348.0	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Storage	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	0.2	NONE	2856	674.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
46LED	Room B3	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	0.4	OCC	2856	1,011.0	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
196LED	Room B2	12	W 32 C F 4 (ELE)	F44ILL	112	1.3	1.3	OCC	2856	3,838.5	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room B2	1	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	OCC	2856	168.5	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Hallways	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	0.5	NONE	8736	4,123.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
196LED	Room B1	12	W 32 C F 4 (ELE)	F44ILL	112	1.3	1.3	OCC	2856	3,838.5	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room XXX	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	OCC	2856	337.0	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Boiler Room	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	0.3	NONE	3825	1,128.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
46LED	Hallways	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	0.3	NONE	8736	2,577.1	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
46LED	Custodian's Office	1	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	OCC	2570.4	151.7	37.9	0.0	\$5.88	\$128.25	\$20.00	21.8	18.4
46LED	Crawl Space	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	NONE	1000	118.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
246	Storage	1	W96CF1 (MAG)	F81EHS	83	0.1	0.1	NONE	2856	237.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
246	Storage	1	W96CF1 (MAG)	F81EHS	83	0.1	0.1	NONE	2856	237.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	1st Floor - Room 118	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	1.1	OCC	2856	3,084.5	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
20LED	Room 118	2	S 28 P F 1 (ELE)	F41ILL	31	0.1	0.1	OCC	2856	177.1	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
20LED	Room 118 Closet	1	S 28 P F 1 (ELE)	F41ILL	31	0.0	0.0	NONE	2856	88.5	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Room 119	12	T 32 R F 3 (ELE)	F43ILL/2	90	1.1	1.1	OCC	2856	3,084.5	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
20LED	Room 119	2	S 28 P F 1 (ELE)	F41ILL	31	0.1	0.1	OCC	2856	177.1	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
20LED	Room 119 Closet	1	S 28 P F 1 (ELE)	F41ILL	31	0.0	0.0	NONE	2856	88.5	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
46LED	Room 117	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	2856	2,527.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room 116	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	2856	2,527.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room 115	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	2856	2,527.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room 114	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	2856	2,527.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room 113	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	2856	2,527.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room 120	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	2856	2,527.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room 121	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	2856	2,527.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room 122	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	2856	2,527.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Corridor	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	NONE	8736	7,731.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
196LED	Boys' Toilet	3	W 32 C F 4 (ELE)	F44ILL	112	0.3	0.3	OCC	1713.6	575.8	143.9	0.0	\$22.31	\$128.25	\$20.00	5.7	4.9
196LED	Girls' Toilet	3	W 32 C F 4 (ELE)	F44ILL	112	0.3	0.3	OCC	1713.6	575.8	143.9	0.0	\$22.31	\$128.25	\$20.00	5.7	4.9
5LED	Principal's Office	5	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.3	0.3	OCC	2570.4	771.1	192.8	0.0	\$29.88	\$128.25	\$20.00	4.3	3.6
196LED	Copy Room	2	W 32 C F 4 (ELE)	F44ILL	112	0.2	0.2	OCC	2570.4	575.8	143.9	0.0	\$22.31	\$128.25	\$20.00	5.7	4.9
5LED	Main Office	9	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.5	0.5	OCC	2570.4	1,388.0	347.0	0.0	\$53.79	\$128.25	\$20.00	2.4	2.0
46LED	Corridor	3	W 32 P F 2 (ELE)	F42ILL	59	0.2	0.2	NONE	8736	1,546.3	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
146LED	Gymnasium	16	High Bay MH 400	MH400/1	458	7.3	7.3	OCC	3570	26,161.0	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Auditorium	40	W 32 P F 2 (ELE)	F42ILL	59	2.4	2.4	OCC	3060	7,221.6	1,805.4	0.0	\$279.84	\$128.25	\$20.00	0.5	0.4
46LED	Room 134	22	W 32 P F 2 (ELE)	F42ILL	59	1.3	1.3	OCC	2856	3,707.1	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Room 133	17	W 32 P F 2 (ELE)	F42ILL	59	1.0	1.0	OCC	2856	2,864.6	0.0	0.0	\$0.00	\$128.25	\$20.00		#DIV/0!
46LED	Office	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	OCC	2570.4	303.3	75.8	0.0	\$11.75	\$128.25	\$20.00	10.9	9.2

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EXISTING CONDITIONS											RETROFIT CONDITIONS											COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures before the retrofit	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space (Watts/Fixt * (Fist No.)	Exist Control	Annual Hours	Annual kWh (kW/Space) * (Annual Hours)	Number of Fixtures after the retrofit	Lighting Fixture Code	Fixture Code	Watts per Fixture	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Annual Hours	Annual kWh (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual \$ Saved (\$/kWh)	Retrofit Cost	Cost for renovations to lighting system	NJ Smart Start Incentive	Simple Payback Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered			
35LED	Basement - Cafeteria	25	T 32 R F 3 (ELE)	F43LL/2	90	2.3	SW	1785	4,016	25	T 59 R LED	RTLED38	38	1.0	OCC	1,785	1,696	2,321	1.3	\$ 359.68	\$ 6,034.50	\$ 1,270	16.8	13.2				
234	Storage	3	R 75 C 1	I75/1	75	0.2	SW	2856	643	3	CF 26	CFQ26/1-L	27	0.1	NONE	2,856	231	411	0.1	\$ 63.75	\$ 60.75	\$ -	1.0	1.0				
46LED	Storage	6	W 32 P F 2 (ELE)	F42LL	59	0.4	SW	2856	1,011	6	4 ft LED Tube	200732/2	30	0.2	NONE	2,856	514	497	0.2	\$ 77.03	\$ 980.10	\$ -	12.7	12.7				
46LED	Storage	6	W 32 P F 2 (ELE)	F42LL	59	0.4	SW	2856	1,011	6	4 ft LED Tube	200732/2	30	0.2	NONE	2,856	514	497	0.2	\$ 77.03	\$ 980.10	\$ -	12.7	12.7				
46LED	Girls Toilet	4	W 32 P F 2 (ELE)	F42LL	59	0.2	SW	2142	506	4	4 ft LED Tube	200732/2	30	0.1	OCC	1,714	206	300	0.1	\$ 46.48	\$ 781.65	\$ 20	16.8	16.4				
46LED	Boys Toilet	3	W 32 P F 2 (ELE)	F42LL	59	0.2	SW	2142	379	3	4 ft LED Tube	200732/2	30	0.1	OCC	1,714	154	225	0.1	\$ 34.86	\$ 618.30	\$ 20	17.7	17.2				
46LED	Computer Lab	8	W 32 P F 2 (ELE)	F42LL	59	0.5	SW	3825	1,805	8	4 ft LED Tube	200732/2	30	0.2	OCC	3,060	734	1,071	0.2	\$ 166.01	\$ 1,435.05	\$ 20	8.6	8.5				
46LED	Band Room	8	W 32 P F 2 (ELE)	F42LL	59	0.5	SW	2856	1,348	8	4 ft LED Tube	200732/2	30	0.2	OCC	2,856	685	663	0.2	\$ 102.70	\$ 1,435.05	\$ 20	14.0	13.8				
46LED	Storage	4	W 32 P F 2 (ELE)	F42LL	59	0.2	SW	2856	674	4	4 ft LED Tube	200732/2	30	0.1	NONE	2,856	343	331	0.1	\$ 51.35	\$ 653.40	\$ -	12.7	12.7				
46LED	Room B3	6	W 32 P F 2 (ELE)	F42LL	59	0.4	SW	2856	1,011	6	4 ft LED Tube	200732/2	30	0.2	OCC	2,856	514	497	0.2	\$ 77.03	\$ 1,108.35	\$ 20	14.4	14.1				
196LED	Room B2	12	W 32 C F 4 (ELE)	F44LL	112	1.3	SW	2856	3,838	12	T 74 R LED	RTLED50	50	0.6	OCC	2,856	1,714	2,125	0.7	\$ 329.35	\$ 2,963.25	\$ 20	9.0	8.9				
46LED	Room B2	1	W 32 P F 2 (ELE)	F42LL	59	0.1	SW	2856	169	1	4 ft LED Tube	200732/2	30	0.0	OCC	2,856	86	83	0.0	\$ 12.84	\$ 291.60	\$ 20	22.7	21.2				
46LED	Hallways	8	W 32 P F 2 (ELE)	F42LL	59	0.5	SW	8736	4,123	8	4 ft LED Tube	200732/2	30	0.2	NONE	8,736	2,097	2,027	0.2	\$ 314.15	\$ 1,306.80	\$ -	4.2	4.2				
196LED	Room B1	12	W 32 C F 4 (ELE)	F44LL	112	1.3	SW	2856	3,838	12	T 74 R LED	RTLED50	50	0.6	OCC	2,856	1,714	2,125	0.7	\$ 329.35	\$ 2,963.25	\$ 20	9.0	8.9				
46LED	Room XXX	2	W 32 P F 2 (ELE)	F42LL	59	0.1	SW	2856	337	2	4 ft LED Tube	200732/2	30	0.1	OCC	2,856	171	166	0.1	\$ 25.68	\$ 454.95	\$ 20	17.7	16.9				
46LED	Boiler Room	5	W 32 P F 2 (ELE)	F42LL	59	0.3	SW	3825	1,128	5	4 ft LED Tube	200732/2	30	0.2	NONE	3,825	574	555	0.1	\$ 85.97	\$ 816.75	\$ -	9.5	9.5				
46LED	Hallways	5	W 32 P F 2 (ELE)	F42LL	59	0.3	SW	8736	2,577	5	4 ft LED Tube	200732/2	30	0.2	NONE	8,736	1,310	1,267	0.1	\$ 196.34	\$ 816.75	\$ -	4.2	4.2				
46LED	Custodian's Office	1	W 32 P F 2 (ELE)	F42LL	59	0.1	SW	3213	190	1	4 ft LED Tube	200732/2	30	0.0	OCC	2,570	77	112	0.0	\$ 17.43	\$ 291.60	\$ 20	16.7	15.6				
46LED	Crawl Space	2	W 32 P F 2 (ELE)	F42LL	59	0.1	SW	1000	118	2	4 ft LED Tube	200732/2	30	0.1	NONE	1,000	60	58	0.1	\$ 8.99	\$ 326.70	\$ -	36.3	36.3				
246	Storage	1	W96CF1 (MAG)	F81EHS	83	0.1	SW	2856	237	1	W96CF1 (MAG)	F81EHS	125	0.1	NONE	2,856	357	(120)	(10.0)	\$ (18.59)	\$ -	\$ -	-	-				
246	Storage	1	W96CF1 (MAG)	F81EHS	83	0.1	SW	2856	237	1	W96CF1 (MAG)	F81EHS	125	0.1	NONE	2,856	357	(120)	(10.0)	\$ (18.59)	\$ -	\$ -	-	-				
35LED	1st Floor - Room 118	12	T 32 R F 3 (ELE)	F43LL/2	90	1.1	SW	2856	3,084	12	T 59 R LED	RTLED38	38	0.5	OCC	2,856	1,302	1,782	0.6	\$ 276.23	\$ 2,963.25	\$ 620	10.7	8.5				
20LED	Room 118	2	S 28 P F 1 (ELE)	F41LL	31	0.1	SW	2856	177	2	4 ft LED Tube	200732x1	15	0.0	OCC	2,856	96	91	0.0	\$ 14.17	\$ 418.65	\$ 30	29.6	27.4				
20LED	Room 118 Closet	1	S 28 P F 1 (ELE)	F41LL	31	0.0	SW	2856	89	1	4 ft LED Tube	200732x1	15	0.0	NONE	2,856	43	46	0.0	\$ 7.08	\$ 145.20	\$ 5	20.5	19.8				
35LED	Room 119	12	T 32 R F 3 (ELE)	F43LL/2	90	1.1	SW	2856	3,084	12	T 59 R LED	RTLED38	38	0.5	OCC	2,856	1,302	1,782	0.6	\$ 276.23	\$ 2,963.25	\$ 620	10.7	8.5				
20LED	Room 119	2	S 28 P F 1 (ELE)	F41LL	31	0.1	SW	2856	177	2	4 ft LED Tube	200732x1	15	0.0	OCC	2,856	96	91	0.0	\$ 14.17	\$ 418.65	\$ 30	29.6	27.4				
20LED	Room 119 Closet	1	S 28 P F 1 (ELE)	F41LL	31	0.0	SW	2856	89	1	4 ft LED Tube	200732x1	15	0.0	NONE	2,856	43	46	0.0	\$ 7.08	\$ 145.20	\$ 5	20.5	19.8				
46LED	Room 117	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	2856	2,528	15	4 ft LED Tube	200732/2	30	0.5	OCC	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,578.50	\$ 20	13.4	13.3				
46LED	Room 116	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	2856	2,528	15	4 ft LED Tube	200732/2	30	0.5	OCC	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,578.50	\$ 20	13.4	13.3				
46LED	Room 115	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	2856	2,528	15	4 ft LED Tube	200732/2	30	0.5	OCC	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,578.50	\$ 20	13.4	13.3				
46LED	Room 114	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	2856	2,528	15	4 ft LED Tube	200732/2	30	0.5	OCC	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,578.50	\$ 20	13.4	13.3				
46LED	Room 113	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	2856	2,528	15	4 ft LED Tube	200732/2	30	0.5	OCC	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,578.50	\$ 20	13.4	13.3				
46LED	Room 120	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	2856	2,528	15	4 ft LED Tube	200732/2	30	0.5	OCC	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,578.50	\$ 20	13.4	13.3				
46LED	Room 121	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	2856	2,528	15	4 ft LED Tube	200732/2	30	0.5	OCC	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,578.50	\$ 20	13.4	13.3				
46LED	Room 122	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	2856	2,528	15	4 ft LED Tube	200732/2	30	0.5	OCC	2,856	1,285	1,242	0.4	\$ 192.57	\$ 2,578.50	\$ 20	13.4	13.3				
46LED	Corridor	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	8736	7,731	15	4 ft LED Tube	200732/2	30	0.5	NONE	8,736	3,931	3,800	0.4	\$ 589.02	\$ 2,450.25	\$ -	4.2	4.2				
196LED	Boys Toilet	3	W 32 C F 4 (ELE)	F44LL	112	0.3	SW	2142	720	3	T 74 R LED	RTLED50	50	0.2	OCC	1,714	257	463	0.2	\$ 71.71	\$ 837.00	\$ 20	11.7	11.4				
196LED	Girls Toilet	3	W 32 C F 4 (ELE)	F44LL	112	0.3	SW	2142	720	3	T 74 R LED	RTLED50	50	0.2	OCC	1,714	257	463	0.2	\$ 71.71	\$ 837.00	\$ 20	11.7	11.4				
5LED	Principal's Office	5	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.3	SW	3213	964	5	2T XX R LED	2RTLED	25	0.1	OCC	2,570	321	643	0.2									

Ridgewood Board Of Education
CHA Project Number: 30237

Rate of Discount (used for NPV) 3.0%

water	Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
	\$ 0.155	\$/kWh blended		0.000420205	58,947	Electric	Natural Gas	Fuel Oil
	\$ 0.155	\$/kWh supply	361,169	0.000420205		\$ 56,066	\$ 35,837	
	\$ -	\$/kW	175.0	0				
	\$ 0.852	\$/Therm	35,837	0.00533471				
	\$ 8.00	\$/kgals	855	0				
		\$/Gal						

Willard Elementary School																							
Recommend?		Item	Savings					Cost	Simple Payback	Life Expectancy	GHG Reduction (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings					ROI	NPV	IRR	
Y or N			kW	kWh	therms	No. 2 Oil gal	Water kgal	\$							kW	kWh	therms	kgal/yr	\$				
N	ECM-1A	Convert the Steam System to Hot Water System	0.0	0	5,613	0	0	4,782	\$ 1,646,025	344.2	30	29.9	\$ 4,500	N	343.2	0.0	0	168,395	0	\$ 143,472	(0.9)	(\$1,547,787)	-11.6%
Y	ECM-1B	Boiler Replacement	0.0	0	1,559	0	0	1,328	\$ 133,153	100.2	30	8.3	\$ 4,500	N	96.8	0.0	0	46,776	0	\$ 39,853	(0.7)	(\$102,614)	-6.3%
N	ECM-2	Replace Pneumatic Control Devices with DDC Devices	0.0	6,228	328	0	0	1,245	\$ 153,428	123.2	20	4.4	\$ -	N	123.2	0.0	124,559	6,567	0	\$ 24,902	(0.8)	(\$134,903)	-13.3%
Y	ECM-3	Install Window AC Controller	0.0	9,838	0	0	0	1,525	\$ 6,200	4.1	15	4.1	\$ -	N	4.1	0.0	147,574	0	0	\$ 22,874	2.7	\$12,005	23.6%
N	ECM-4	DHW Heater Replacement	0.0	0	500	0	0	426	\$ 14,280	33.5	15	2.7	\$ 2,040	N	28.7	0.0	0	7,500	0	\$ 6,390	(0.6)	(\$7,154)	-7.2%
N	ECM-L1	Lighting Replacements / Upgrades	30.3	101,344	0	0	0	15,708	\$ 144,534	9.2	15	42.6	\$ 4,495	N	8.9	454.4	1,520,160	0	0	\$ 235,625	0.6	\$47,486	7.3%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	8,034	0	0	0	1,245	\$ 8,208	6.6	15	3.4	\$ 1,280	N	5.6	0.0	120,510	0	0	\$ 18,679	1.3	\$7,938	16.0%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	30.3	105,780	0	0	0	16,396	\$ 152,742	9.3	15	44.4	\$ 5,775	N	9.0	454.4	1,586,700	0	0	\$ 245,939	0.6	\$48,766	7.3%
Total (Does Not Include ECM-L1 & ECM-L2)			30.3	121,846	8,001	0	0	\$ 25,703	\$ 2,105,827	81.9	20.8	94	\$ 16,815		81.3	454	1,858,834	229,239	-	\$ 483,431	(0.8)	(1,731,689)	-10.8%
Recommended Measures (highlighted green above)			30.3	115,618	1,559	0	0	\$ 19,249	\$ 292,095	15.2	20.0	57	\$ 10,275	0	14.6	454	1,734,274	46,776	-	\$ 308,666	0.1	(41,844)	3.2%
% of Existing			17%	32%	4%	0	0																

City:		Newark, NJ					
Occupied Hours/Week		50					
		Building	Auditorium	Gymnasium	Library	Classrooms	
Temp	Enthalpy h (Btu/lb)	Operating Hours	Occupied Hours	Occupied Hours	Occupied Hours	Occupied Hours	
102.5							
97.5	35.4	6	2	0	0	0	0
92.5	37.4	31	9	0	0	0	0
87.5	35.0	131	39	0	0	0	0
82.5	33.0	500	149	0	0	0	0
77.5	31.5	620	185	0	0	0	0
72.5	29.9	664	198	0	0	0	0
67.5	27.2	854	254	0	0	0	0
62.5	24.0	927	276	0	0	0	0
57.5	20.3	600	179	0	0	0	0
52.5	18.2	730	217	0	0	0	0
47.5	16.0	491	146	0	0	0	0
42.5	14.5	656	195	0	0	0	0
37.5	12.5	1,023	304	0	0	0	0
32.5	10.5	734	218	0	0	0	0
27.5	8.7	334	99	0	0	0	0
22.5	7.0	252	75	0	0	0	0
17.5	5.4	125	37	0	0	0	0
12.5	3.7	47	14	0	0	0	0
7.5	2.1	34	10	0	0	0	0
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	78%
Cooling Eff (kW/ton)	1.2

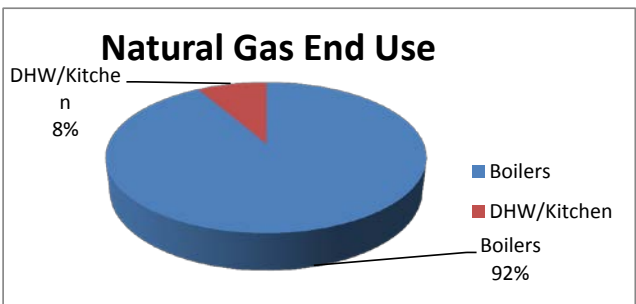
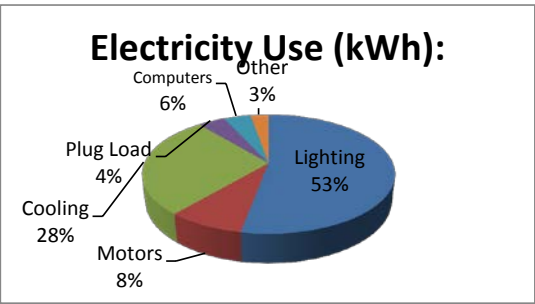
Heating	
Hours	4,427 Hrs
Weighted Avg	40 F
Avg	28 F

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

Utility End Use Analysis			
Electricity Use (kWh):		Notes/Comments:	
361,169	Total	Based on utility analysis	
191,234	Lighting	From Lighting Calculations	
30,000	Motors	Estimated	
100,000	Cooling	Estimated	
15,000	Plug Load	Estimated	
15,000	Computers	Estimated	
9,935	Other	Remaining	
Natural Gas Use (Therms):		Notes/Comments:	
35,837	Total	Based on utility analysis	
32,837	Boilers	Therms/SF x Square Feet Served	
3,000	DHW/Kitchen	Based on utility analysis	

53%
 8%
 28%
 4%
 4%
 3%

92%
 8%



Ridgewood Board Of Education
CHA Project Number: 30237
Willard Elementary School

ECM-1A Convert the Steam System to Hot Water System

Description: The facility is interested in converting the steam system to hot water system regardless of the high initial cost. This measure evaluates the energy savings associated with replacing the low efficiency steam system with a modern high efficiency hot water system which would include condensing gas boilers operating on an outdoor air temperature reset schedule.

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	\$ 0.85	/ Therm	Natural Gas
Baseline Fuel Cost		/ Gal	No. 2 Oil
FORMULA CONSTANTS			
Oversize Factor	0.8		
Hours per Day	24		
Infrared Conversion Factor	1.0		1.0 if Boiler, 0.8 if Infrared Heater
EXISTING			
Capacity	3,491,577	btu/hr	Estimated Boiler Load % and Capacity
Heating Combustion Efficiency	78%		Estimated averaged Efficiency
Heating Degree-Day	2,792	Degree-day	
Design Temperature Difference	57	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	3,491,577	btu/hr	
Efficiency	90%		
SAVINGS			
Fuel Savings	5,613	therms	NJ Protocols Calculation
Fuel Cost Savings	\$ 4,782		

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

Algorithms

Gas Savings (Therms)

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

Definition of Variables

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

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

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

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

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

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

EFF_B = Efficiency of baseline heaters (AFUE %)

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

Furnaces and Boilers

Component	Type	Value	Source
AFUE _q	Variable		Application
AFUE _b	Fixed	Furnaces: 78% Boilers: 80% Infrared: 78%	EPACT Standard for furnaces and boilers
CAPY _{in}	Variable		Application
ΔT	Variable	See Table Below	1
HDD _{mod}	Fixed	See Table Below	1

Sources:

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

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

Ridgewood Board Of Education

CHA Project Number: 30237

Willard Elementary School

ECM-1A Convert the Steam System to Hot Water System -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.		
Full HW conversion	38,316	SF	\$ 14	\$ 14		\$ 550,901	\$ 668,376	\$ -	\$ 1,219,277	Estimated based on prior experience
						\$ -	\$ -	\$ -	\$ -	

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

\$ 1,219,277	Subtotal
\$ 426,747	35% Contingency
\$ 1,646,025	Total

Ridgewood Board Of Education
CHA Project Number: 30237
Willard Elementary School

ECM-1B Boiler Replacement

Description: This measure looks at replacing one boiler in kind and using it as the main the boiler.

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	\$ 0.85	/ Therm	Natural Gas
Baseline Fuel Cost		/ Gal	No. 2 Oil
FORMULA CONSTANTS			
Oversize Factor	0.8		
Hours per Day	24		
Infrared Conversion Factor	1.0		1.0 if Boiler, 0.8 if Infrared Heater
EXISTING			
Capacity	3,491,577	btu/hr	Estimated Boiler Load % and Capacity
Heating Combustion Efficiency	78%		Estimated averaged Efficiency
Heating Degree-Day	2,792	Degree-day	
Design Temperature Difference	57	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	3,491,577	btu/hr	
Efficiency	81%		
SAVINGS			
Fuel Savings	1,559	therms	NJ Protocols Calculation
Fuel Cost Savings	\$ 1,328		

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

Algorithms

Gas Savings (Therms)

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

Definition of Variables

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

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

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

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

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

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

EFF_B = Efficiency of baseline heaters (AFUE %)

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

Furnaces and Boilers

Component	Type	Value	Source
AFUE _q	Variable		Application
AFUE _b	Fixed	Furnaces: 78% Boilers: 80% Infrared: 78%	EPACT Standard for furnaces and boilers
CAPY _{in}	Variable		Application
ΔT	Variable	See Table Below	1
HDD _{mod}	Fixed	See Table Below	1

Sources:

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

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

Ridgewood Board Of Education

CHA Project Number: 30237

Willard Elementary School

ECM-1A Convert the Steam System to Hot Water System - 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.		
5,520 MBH NG Condensing Boiler	1	EA	\$58,000	\$ 8,600		\$ 59,566	\$ 10,716	\$ -	\$ 70,282	RS Means
Flue Installation	1	LS	\$ 5,000	\$ 5,000		\$ 5,135	\$ 6,230	\$ -	\$ 11,365	Estimated
Miscellaneous Electrical	1	EA	\$ 2,500	\$ 2,500		\$ 2,568	\$ 3,115	\$ -	\$ 5,683	Estimated
Miscellaneous GC work	1	LS	\$ 2,500	\$ 2,500		\$ 2,568	\$ 3,115	\$ -	\$ 5,683	Estimated
Crane	1	LS			\$ 5,000	\$ -	\$ -	\$ 5,620	\$ 5,620	Estimated
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

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

\$ 98,632	Subtotal
\$ 34,521	35% Contingency
\$ 133,153	Total

Ridgewood Board Of Education
 CHA Project Number: 30237
 Willard Elementary School

ECM-2 Replace Pneumatic Control Devices with DDC Devices

Description: This ECM evaluates the energy savings associated with replacing the existing pneumatic devices including the air compressor with digital control devices. The full DDC system will have better control on the building temperature settings since it eliminates the air leaks in the pneumatic system. the building already has a temperature setback program. therefore, the savings are from better temp control and the air compressor energy usage reduction

Building Information:

58,947	Sq Footage	\$0.155	\$/kWh Blended
Y	Cooling	\$0.85	\$/Therm
Y	Heating		

Hybrid to Full DDC Savings

EXISTING CONDITIONS			
Existing Facility Total Electric usage		361,169	kWh
Existing Facility Total Gas usage		35,837	Therms
Existing Facility Cooling Electric usage		100,000.0	kWh ¹
Existing Facility Heating Natural		32,837	Therms ²
PROPOSED SAVINGS			
Proposed Facility Cooling Electric Savings		1,000	kWh
Proposed Facility Natural Gas Savings		328	Therms
Air Compressor Electric Savings		5,228	kWh
SAVINGS			
Electric Savings		6,228	kWh
Natural Gas Savings		328	Therms

Air Compressor

Motor Capacity	Load	Run Hours	Electric Usage
HP	%	hr/yr	kWh/yr
2	80%	4,380	5,228

Assumptions

- 28% of facility total electricity dedicated to Cooling; based on utility information
- 92% of facility total natural gas dedicated to Heating; based on utility information
- 1% Estimated savings of eliminating the air leaks
- \$ 4,380 Annual air compressor run hours

COMBINED SAVINGS			
Natural Gas Savings		328	Therms
Cooling Electricity Savings		6,228	kWh
Total Cost Savings	\$	1,245	
Estimated Total Project Cost	\$	153,428	
Simple Payback		123.2	Yrs

Savings calculation formulas for setback are taken from NJ Protocols document for Occupancy Controlled Thermostats
 Savings calculations for additional controls are estimated based on the level of control to be added and prior experience

Ridgewood Board Of Education
 CHA Project Number: 30237
 Willard Elementary School

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-2 Replace Pneumatic Control Devices with DDC Devices - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	
DDC Device and Programming	1	ls	\$ 50,000	\$ 50,000		\$ 51,350	\$ 62,300	\$ -	\$ 113,650	Estimated
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

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

\$ 113,650	Subtotal
\$ 39,778	35% Contingency
\$ 153,428	Total

Ridgewood Board Of Education
CHA Project Number: 30237
Willard Elementary School

EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (btu/h)	
Window AC	Classrooms	300,000	30 units
Total btu/h of all window A/C Units: 300,000 btu/h			

ECM-3 Install Window AC Controller

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	\$0.155 / kWh	
Average run hours per Week	50 Hours	
Space Balance Point	55 F	
Space Temperature Setpoint	65 deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	300,000 Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	12.0	
Existing Annual Electric Usage	20,878 kWh	

Item	Value	Units	Comments
Proposed Annual Electric Usage	11,040	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS	
Annual Electrical Usage Savings	9,838 kWh
Annual Cost Savings	\$1,525
Total Project Cost	\$6,200
Simple Payback	4 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	2	100%	2
92.5	31	9	100%	9
87.5	131	39	87%	34
82.5	500	149	73%	109
77.5	620	185	60%	111
72.5	664	198	47%	92
67.5	854	254	33%	85
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	835	53%	442

Ridgewood Board Of Education
CHA Project Number: 30237
Willard Elementary School

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-3 Install Window AC Controller - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						0	\$ -	\$ -	\$ -	
Window AC Controller	30	EA	\$ 150	\$ -	\$ -	4621.5	\$ -	\$ -	\$ 4,622	Estimated
						\$ -	\$ -	\$ -	\$ -	

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

\$ 4,622	Subtotal
\$ 1,618	35% Contingency
\$ 6,200	Total

Ridgewood Board Of Education
CHA Project Number: 30237
Willard Elementary School

ECM-4 DHW Heater Replacement

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

Item	Value	Units	Formula/Comments
Avg. Monthly Utility Demand by Water Heater	250	Therms/month	Calculated from utility bill
Total Annual Utility Demand by Water Heater	300,000	MBTU/yr	1therm = 100 MBTU
Existing DHW Heater Efficiency	80%		Per manufacturer nameplate
Total Annual Hot Water Demand (w/ standby losses)	240,000	MBTU/yr	
Existing Tank Size	200	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)	2.9	MBH	
Annual Standby Hot Water Load	25,441	MBTU/yr	
New Tank Size	200	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)	2.9	MBH	
Annual Standby Hot Water Load	25,441	MBTU/yr	
Total Annual Hot Water Demand	240,000	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Proposed Fuel Use	2,500	Therms	Standby Losses and inefficient DHW heater eliminated
Utility Cost	\$0.85	\$/Therm	
Existing Operating Cost of DHW	\$2,556	\$/yr	
Proposed Operating Cost of DHW	\$2,130	\$/yr	

Savings Summary:

Utility	Energy Savings	Cost Savings
Therms/yr	500	\$426

Ridgewood Board Of Education
 CHA Project Number: 30237
 Willard Elementary School

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-4 DHW Heater Replacement - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
DHW Heater Removal	2	LS		\$ 50		\$ -	\$ 125	\$ -	\$ 125	RS Means 2012
120 MBH High Efficiency Gas-Fired DHW Heater	1	EA	\$ 3,000	\$ 1,000		\$ 3,081	\$ 1,246	\$ -	\$ 4,327	From Internet Price/ Estimated Labor Cost*
Miscellaneous Electrical	1	LS	\$ 300			\$ 308	\$ -	\$ -	\$ 308	RS Means 2012
Venting Kit	1	EA	\$ 450	\$ 650		\$ 462	\$ 810	\$ -	\$ 1,272	RS Means 2012
Miscellaneous Piping and Valves	1	LS	\$ 2,000	\$ 2,000		\$ 2,054	\$ 2,492	\$ -	\$ 4,546	Estimated

* Rheem SPIDefire

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

\$ 10,578	Subtotal
\$ 3,702	35% Contingency
\$ 14,280	Total

Ridgewood Board Of Education
CHA Project Number: 30237
Willard Elementary 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 governments 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)	58,947
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilities (BPU)

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

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	\$56,066	\$35,837
Existing Usage (from utility)	361,169	35,837
Proposed Savings	115,618	1,559
Existing Total MMBtus	4,816	
Proposed Savings MMBtus	551	
% Energy Reduction	11.4%	
Proposed Annual Savings	\$19,249	

	Min (Savings = 15%)		Increase (Savings > 15%)		Max Incentive		Achieved Incentive	
	\$/kWh	\$/therm	\$/kWh	\$/therm	\$/kWh	\$/therm	\$/kWh	\$/therm
Incentive #2	\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.00	\$0.00
Incentive #3	\$0.09	\$0.90	\$0.005	\$0.05	\$0.11	\$1.25	\$0.00	\$0.00

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

Total Project Cost	\$292,095
--------------------	-----------

	Allowable Incentive	
% Incentives #1 of Utility Cost*	0.0%	\$0
% Incentives #2 of Project Cost**	0.0%	\$0
% Incentives #3 of Project Cost**	0.0%	\$0
Total Eligible Incentives***	\$0	
Project Cost w/ Incentives	\$292,095	

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

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

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

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

*** Maximum allowable amount of Incentive #1 is \$50,000 if not funded by NJ BPU, and \$25,000 if it is.

Maximum allowable amount of Incentive #2 & #3 is \$1 million per gas account and \$1 million per electric account; maximum 2 million per project

APPENDIX 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



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NJ SmartStart Buildings

Program Overview

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SBC CREDIT PROGRAM



With New Jersey SmartStart Buildings ...

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

Special Notice

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

Visit the Sandy web page for details and important links.

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

[Project Categories](#)

[Custom Measures](#)

[Incentives for Qualifying Equipment and Projects](#)

[Program Terms and Conditions](#)

[Find a Trade Ally](#)

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

Getting Started

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

PAST PROGRAMS**TOOLS AND RESOURCES****PROGRAM UPDATES****CONTACT US**

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

Support for Custom Energy-Efficiency Measures

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

Incentives for Qualifying Equipment and Projects

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

Find out more about equipment incentives

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

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Equipment Incentives

Special Notice

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

Visit the Sandy web page for details and important links.

More reasons for a smart start on your next project!

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

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

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

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



Electric Chillers

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

Gas Cooling

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

PAST PROGRAMS**TOOLS AND RESOURCES****PROGRAM UPDATES****CONTACT US****Desiccant Systems** (\$1.00 per cfm - gas or electric)**Electric Unitary HVAC**

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

Ground Source Heat Pumps

Closed Loop (\$450-750 per ton)

Gas Heating

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

Variable Frequency Drives

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

Natural Gas Water Heating

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

Premium Motors

Three-phase motors (\$45 - \$700 per motor) (**Incentive was discontinued effective March 1, 2013 except for buildings impacted by Hurricane Sandy. Approved applications will have the standard timeframe from the program commitment date to complete the installation.**)

Refrigerator/Freezer Case Premium Efficiency Motors (ECM)

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

Prescriptive Lighting

New Linear Fluorescent

T-12, HID and Incandescent to T-5 and T-8 (\$25 - \$200 per fixture) (**Note: T12 replacements are only available for buildings impacted by Hurricane Sandy**)

New Induction (\$70 per replaced HID fixture)

New LED

Screw-in/Plug-in (\$10 - \$20 per lamp)

Refrigerator/Freezer Case (\$30 - \$65 per fixture)

Outdoor pole/arm/wall-mounted luminaires (\$100 - \$175 per fixture)

Display case (\$30 per case)

Shelf-mounted display and task (\$15 per linear foot)

Wall-wash, desk, recessed (\$20 - \$35 per fixture)

Parking garage luminaires (\$100 per fixture)

Track or Mono-Point directional (\$50 per fixture)

Stairwell and Passageway luminaires (\$40 per fixture)

High-Bay, Low-Bay (\$150 per fixture)

Bollard (\$50 per fixture)

Luminaires for Ambient Lighting of Interior Commercial Space
Linear panels (\$50 per fixture)

Fuel pump canopy (\$100 per fixture)

LED retrofit kits (custom measures)

New Pulse-Start Metal Halide (\$25 per fixture)

Linear Fluorescent Retrofit (\$10 - \$20 per fixture)

Induction Retrofit (\$50 per retrofitted HID fixture)

New Construction/Complete Renovation (performance-based)

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

Lighting Controls

Occupancy Sensors

Wall mounted (\$20 per control)

Remote mounted (\$35 per control)

Daylight dimmers (\$25 per fixture controlled, \$50 per fixture for office applications only)

Occupancy controlled hi-low fluorescent controls (\$25 per fixture controlled)

HID or Fluorescent Hi-Bay Controls

Occupancy hi-low (\$35 per fixture controlled)

Daylight dimming (\$45 per fixture controlled)

Refrigeration

Covers and Doors

Energy-Efficient doors for open refrigerated doors/covers (\$100 per door)

Aluminum Night Curtains for open refrigerated cases (\$3.50 per linear foot)

Controls

Door Heater Control (\$50 per control)

Electric Defrost Control (\$50 per control)

Evaporator Fan Control (\$75 per control)

Novelty Cooler Shutoff (\$50 per control)

Food Service Equipment

Cooking

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

Holding

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

Cooling

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

Cleaning

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

Other Equipment Incentives*

Performance Lighting (\$1.00 per watt per square foot below program incentive threshold, currently 5% more energy efficient than ASHRAE 2007 for New Construction only.)

Custom electric and gas equipment incentives (not prescriptive)

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

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II. DIRECT INSTALL



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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 and how to get through the process. Created specifically for existing small to medium facilities, Direct Install is a turnkey solution that makes it easy and affordable to upgrade high efficiency equipment. Direct Install is designed to cut your facility's energy costs replacing lighting, HVAC and other outdated operational equipment with energy efficient 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 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 500,000 Btuh and furnaces may not exceed 140,

III. PAY FOR PERFORMANCE (P4P)



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Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

Take a comprehensive, whole-building approach to saving energy in your existing facility. Earn incentives that are directly linked to your savings. Pay for Performance relies on a



program partners who provide technical services under direct contract to you. Acting as your energy expert, your partner will develop a whole-building energy reduction plan for each project with a whole-building technical component of a traditional energy audit, a financial plan for full implementation of energy efficient measures and a construction schedule for installation.

Eligibility

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

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

ENERGY STAR Portfolio Manager

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



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

Incentives

**OIL, PROPANE & MUNICIPAL
ELECTRIC CUSTOMERS**

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

EDA PROGRAMS

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

SBC CREDIT PROGRAM

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

PAST PROGRAMS

TOOLS AND RESOURCES

Incentive #3 - Completion of Post-Construction Benchmarking Report - A completed report verifying energy reductions based on one year of post-

PROGRAM UPDATES

implementation results. Incentives for electricity and natural gas savings will be based on actual savings, provided that the minimum performance threshold of savings has been achieved.

CONTACT US



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

Steps to Participation

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

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How did you learn about this Energy Efficiency Program?

- ☐ Advertisement ☐ Internet Search ☐ Mailer ☐ Video
☐ 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
Phone/Fax	E-mail	Federal ID/SSN	NAICS Code
		Zip	

Partner Information

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

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

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*Incentives/Requirements subject to change.



001-FY16-07/15

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

ADMINISTRATOR – New Jersey Board of Public Utilities (NJBPB)

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 master-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 IMPLICITLY. NO WARRANTIES OR REPRESENTATIONS OF ANY KIND, WHETHER STATUTORY, EXPRESSED, OR IMPLIED, INCLUDING, WITHOUT LIMITATIONS, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING EQUIPMENT OR SERVICES PROVIDED BY A MANUFACTURER OR VENDOR. CONTACT YOUR VENDOR/ SERVICES PROVIDER FOR DETAILS REGARDING PERFORMANCE AND WARRANTIES.

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)



Your Power to Save

At Home, for Business, and for the Future

[About Us](#) | [Press Room](#) | [Library](#)

HOME

RESIDENTIAL

COMMERCIAL, INDUSTRIAL
AND LOCAL GOVERNMENT

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND
FUEL CELLSLOCAL GOVERNMENT ENERGY
AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT
PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL
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 make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. The program also allows agencies to reduce energy usage with minimal expenditure of new financial resources.

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

Local Government
School Districts (K-12)

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

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings
Procedures for Implementation

The ESIP approach may not be appropriate for all energy conservation and energy 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 a list 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 REDUCTION 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).

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

ESIP PROGRAM

Final version 42413

BPU RULES

1. Public Entity must decide if they will use an ESCO or DIY method or Hybrid thereof prior to issuing the RFP and the RFP must state the intended method. A change in the project procurement model after the RFP closing date will be cause for immediate rejection and disqualification of potential Clean Energy program incentives.
2. RFP procedures shall be adhered to as per the legislation, including the use of BPU approved forms. Any alteration of the forms, without prior approval from the BPU shall be grounds for rejection.
3. RFP must include copy of an audit (ASHRAE Level II w/Level III for lighting) and audit must be prepared by a firm classified by DPMC in the 036 discipline.
4. All firms, including professional services, whether using ESCO or DIY model, must be DPMC classified.
5. If an Architect is engaged by the public entity, the architectural fees are the responsibility of the public entity and must be paid directly to the firm. These fees may be included in the energy cost savings analysis and payback.

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

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

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

7. There shall be no negative cash flow in any year of the program.
section 7 (1)(a)
"the energy savings resulting from the program will be sufficient to cover the cost of the program's energy conservation measures."
8. SREC values are not permitted to be used in the energy cost savings calculations.
9. Capital cost avoidance values are not to be used in the energy savings calculations.
10. Operational and Maintenance (O&M) cost savings may be permitted in the cost savings calculations, but only with supporting documentation.
11. Blended utility rates shall not be permitted. Use the actual utility tariff or local contracted rates if there is a third party supplier.

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

12. Contracted third party utility rates may only be used for the term of the contract (5 yr. maximum)
Subsequent years are to be projected at the utility tariff rates plus the annual BPU escalation rates.
13. Public entity shall conduct M&V (measurement and verification) at the one (1) year operational date and shall provide a copy of the M&V report to the Board of Public Utilities.

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

14. The decisions made by BPU staff regarding compliance or other issues that arise in connection with the RFP procurement process shall be considered a final decision of the BPU. Any appeal will need to be through the New Jersey Superior Court, Appellate Division.
15. For the RFP proposals only, Demand Response (DR) revenues claimed by ESCO's can only be projected for a maximum period of three (3) years. DR revenue projections beyond three years will not be permitted. DR revenues must be included and presented under the "Energy Rebates/Incentives" column of FORM VI.
16. ESCO "fees" proposed during the RFP phase of the project cannot increase post-award. ESCO's are required to maintain the fee percentages through final contract negotiations and construction of the Board approved Energy Savings Plan
17. Public Bid openings shall be held on the due date of the proposal submissions. The public entity shall announce the name of the bidder and the total dollar amount. After award of a contract, all proposals received will be made available by the owner for public inspection
18. Rejection of bids by the public entity shall be conducted in accordance with the appropriate sections of the applicable legislation, as stated in Title 40A:11-13.2. Additionally all proposals must be returned to the respective ESCO's upon rejection.
19. Field changes that exceed 5% of the project cost require BPU approval.
20. Energy Savings Plans (ESP) that is dependent upon incentives from the Clean Energy Program must review the current program requirements, at the time of application, for each incentive to insure eligibility. If any program incentive is denied, resubmission of all ESIP related forms will be necessary to remain ESIP qualified.

APPENDIX E

Photovoltaic Analysis

APPENDIX F

Photos



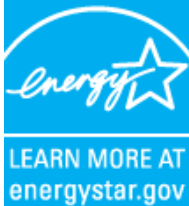
Existing Window ACs

No Picture Available

Existing Lights

APPENDIX G

EPA Benchmarking Report



ENERGY STAR® Statement of Energy Performance

53

ENERGY STAR®
Score¹

Willard Elementary School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 58,947
Built: 1927

For Year Ending: March 31, 2015
Date Generated: July 08, 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

Willard Elementary School
601 Morningside Rd.
Ridgewood, New Jersey 07451

Property Owner

,
(____)____-____

Primary Contact

,
(____)____-____

Property ID: 4461825

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

81.7 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	3,583,654 (74%)
Electric - Grid (kBtu)	1,232,309 (26%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	84.5
National Median Source EUI (kBtu/ft²)	133.9
% Diff from National Median Source EUI	-3%

Source EUI

129.5 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	355
--	-----

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)