RIDGEWOOD BOARD OF EDUCATION

BEN FRANKLIN MIDDLE SCHOOL

335 N Van Dien Ave, Ridgewood NJ 07450

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

July 2015

Prepared by:

6 Campus Drive
Parsippany, NJ 07054
(973) 538-2120

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 ±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 conservation measures (ECMs) have also been identified in this study. This report details the results of the energy audit conducted for the building listed below:

Building Name	Address	Square Feet	Construction Date
Ben Franklin Middle School	335 N Van Dien Ave, Ridgewood NJ 07450	190,400	1949 and 1954

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)
Ben Franklin Middle School	140,384	8,529	$29,149	17.4

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 choses to pursue an Energy Savings Improvement Plan (ESIP), high payback measures could be bundled with lower payback measures which ultimately can result in a payback which is favorable for an ESIP project to proceed. Occasionally, we will recommend an ECM that has a longer payback period. 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

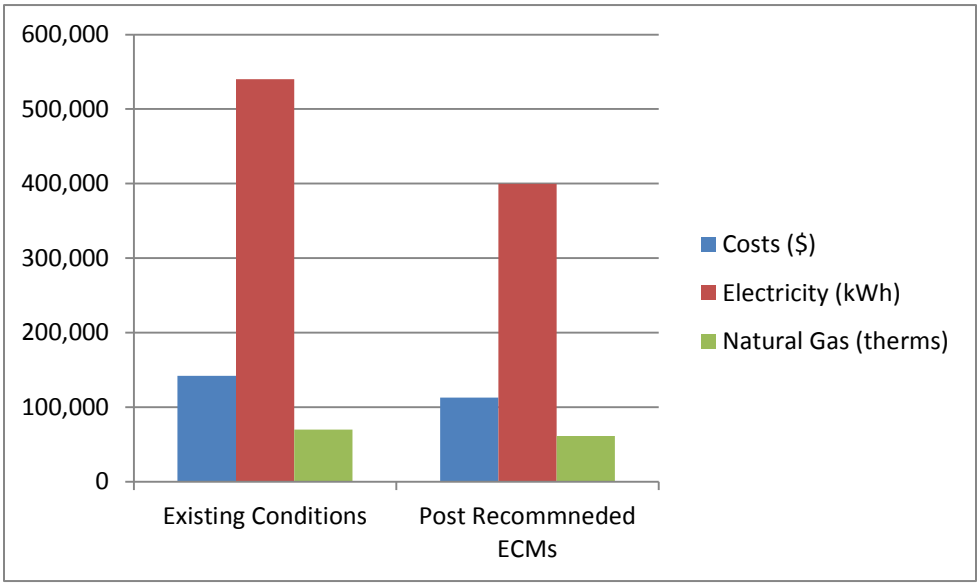
ECM #	Energy Conservation Measure	Est. Costs ($)	Est. Savings ($/year)	Payback w/o Incentive	Potential Incentive ($)*	Payback w/ Incentive	Recommended
ECM-1A	Convert the Steam System to Hot Water System	4,089,763	12,657	323.1	7,000	322.6	N
ECM-1B	Boiler Replacement	223,300	5,625	39.7	7,000	38.5	Y
ECM-2	Replace Motors in HV Units	7,190	653	11.0	0	11.0	Y
ECM-3	Replace Pneumatic Control Devices with DDC Devices	494,944	2,012	246.0	0	246.0	N
ECM-4	Install Window AC Controllers	8,300	2,487	3.3	0	3.3	Y
ECM-5	Install Kitchen Hood Controls	32,747	1,555	21.1	0	21.1	Y
ECM-6	Walk-in Cooler & Freezer EC Motor Retrofits	22,275	984	22.6	0	22.6	Y
ECM-L1**	Lighting Replacements / Upgrades	198,098	14,809	13.4	21,970	11.9	N
ECM-L2**	Install Lighting Controls (Add Occupancy Sensors)	15,005	4,094	3.7	2,340	3.1	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	213,103	17,845	11.9	24,310	10.6	Y
	Total**	**5,091,623**	**43,818**	**116.2**	**38,310**	**115.3**	
	Total(Recommended)	**506,916**	**29,149**	**17.4**	**31,310**	**16.3**	

* 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 104 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 ($)	142,068	112,919	21%
Electricity (kWh)	540,125	399,741	26%
Natural Gas (therms)	69,714	61,185	12%
Site EUI (kbtu/SF/Yr)	46.3	39.3	



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 representative photos of some of the existing conditions observed while onsite.

Building Name: Ben Franklin Middle School
Address: 335 N Van Dien Ave, Ridgewood NJ 07450
Gross Floor Area: 190,400
Number of Floors: Two floors and one basement
Year Built: 1949 and 1954

Building Envelope

Description of Spaces: This is an academic and office building which has offices, classrooms, auditoriums, gymnasiums, cafeterias, computer labs, restrooms and mechanical rooms.
Description of Occupancy: The facility serves about 736 students from grade 6 to grade 8. There are also about 55 school faculty and staff members.
Number of Computers: The building has approximately 300 desktop and laptop computers.
Building Usage: The buildings office hours are typically from 7:30AM to 3:30PM during the 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 flat roofs which are covered with a white 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 exterior doors are still in good condition; therefore, no ECMs associated with exterior doors were evaluated.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: The building is heated by two Kewanee Boiler Corp. steam boilers located in the basement mechanical room. Each of the boilers has a rated energy input of 8,370MBH and energy output of 6,695MBH which results in a nameplate efficiency of 79.9%. There is also an old steam boiler which is original to the building. In discussions with the facility staff, it was noted that this boiler is disconnected and is no longer in use. The condensate is pumped back to the condensate tank by using ¾ HP 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 produced by the boilers is distributed to both steam coils (in the HV units) as well as baseboard fin-tube heaters. Apart from the central steam system there is a Lennox roof top unit equipped with a gas fired furnace. This unit provides the extra heating required by the auditorium.

An ECM related to replacing the steam system with a hot water system has been evaluated due to the systems age and the facility staff's interest in the measure.

Cooling: The building does not currently have a central cooling system. However, the auditorium is cooled by a large Lennox roof top unit (RTU) which was recently installed. This unit has a rated cooling capacity of 40 tons and an EER of 9.8. There are also two direct expansion (DX) split ductless units serving the guidance offices and teacher's cafeteria. These two units were not accessible during the site visit; therefore, their capacities are currently unknown. Besides the RTUs and split units, there are many window AC units used in classrooms and offices to provide further cooling.

An ECM associated with motor replacement on the HV units has been evaluated.

Ventilation: Each of the HVs have air intakes to provide fresh air for the areas they serve. The amount of the outdoor air 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 the ventilation system were evaluated.

Exhaust: There are multiple, fractional HP exhaust fans that serve restrooms and general building exhaust, all located on the roof. The fans are enclosed; therefore, the capacities of fan motors are unknown. However, the exhaust fan covers appear to be in good condition and the school staff confirmed that they are relatively new; therefore, no ECMs related to the exhaust system were evaluated.

Controls Systems

This building has a hybrid control system which consists of an Alerton 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 3HP 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^{o}F and 78 ^{o}F and unoccupied temperature is set at 85 ^{o}F. The heating season occupied temperature is typically set between 68^{o}F and 72 ^{o}F and unoccupied temperature is set at 55 ^{o}F. During the site visit, it was noted that there are some leaks in the pneumatic control system. Therefore, an ECM related to replacing the pneumatic devices with digital control devices has been included.

Domestic Hot Water Systems

This building has an A.O.Smith gas fired DHW heater located in the mechanical room. This DHW heater was installed in 2014 and appears to be in excellent condition. The heater has a rated 660 MBH heating input and 528 MBH heating output which results in a nameplate efficiency of 80%. The DHW heating system is brand new, therefore, no ECMs associated with DHW system have been evaluated.

Kitchen Equipment

The building has a warm-up kitchen. The kitchen equipment includes two reach-in refrigerators, two reach-in freezers, one walk-in refrigerator and one walk-in freezer. The kitchen also has ovens, stoves and a 2’ by 8’ kitchen hood which was not used often based on kitchen staff. The kitchen equipment appears to be in good condition. It is suggested that Energy Star kitchen equipment be used to replace them when they reach the end of their useful lifespan. Also a walk-in refrigerator/freezer controller is evaluated in the ECM section.

Plug Load

This building has computers, residential appliances (microwave, refrigerator), and printers which contribute to the plug load in the building. The school usually turn off the appliances when leave the school. Therefore, no ECMs are associated with plug load. 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

The plumbing system has been renovated and the restrooms contain new style toilets that are low volume plumbing fixtures and waterless urinals. The sink faucets appear to have low-flow type aerators. Therefore, no ECMs are associated with plumbing systems.

Lighting Systems

The building has a mixture of 32W T-8 fluorescent lighting, CFLs lights, T-5 fluorescent, and incandescent lights. The majority of lighting fixtures are T-8 fluorescent linear fixtures; however, the library, some classrooms and offices have been upgraded to T-5 fluorescent lights. The auditorium still has old types of light fixtures which appear to be high pressure sodium lights. 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

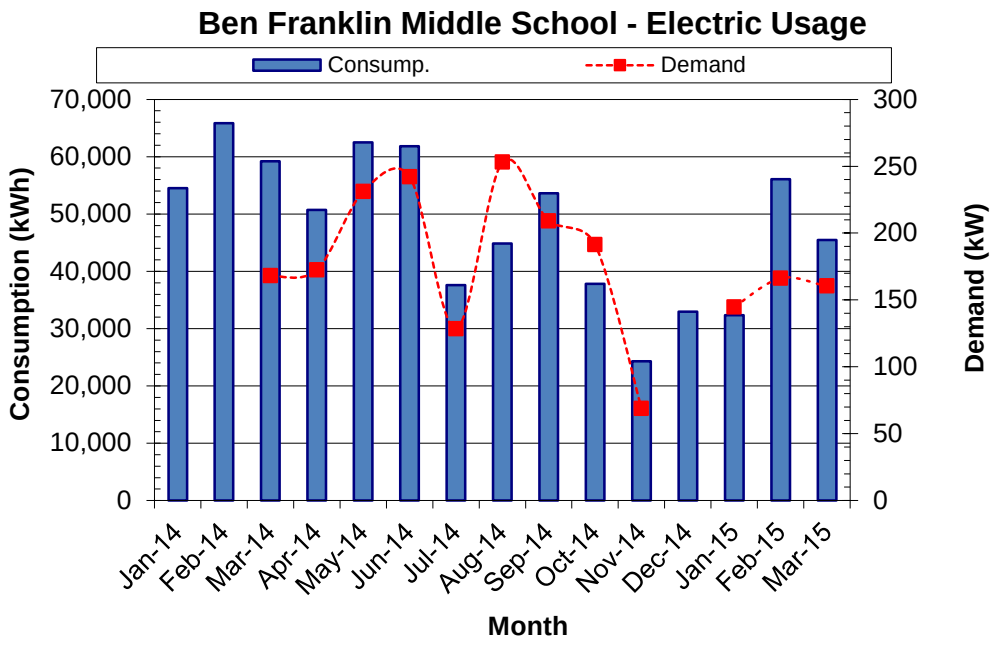
Natural gas, electricity and water are separately metered into this building. Utilities used by the building are delivered and supplied by the following utility companies:

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

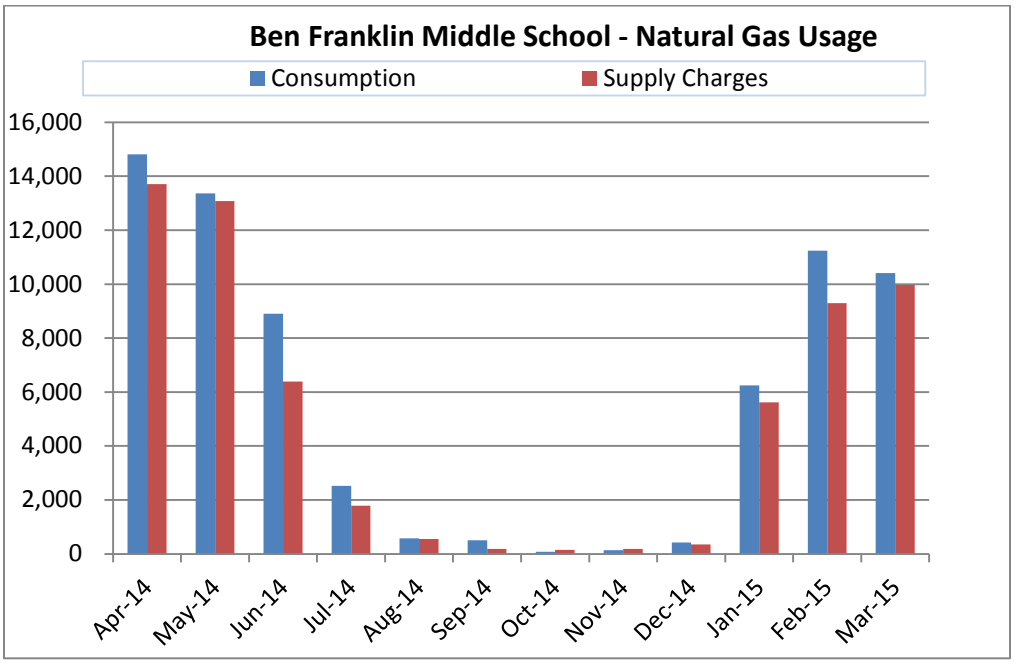
For the 12-month period ending in March 2015, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	540,125	kWh
Annual Cost	85,118	$
Blended Unit Rate	0.158	$/kWh
Peak Demand	253.0	kW
Min. Demand	68.9	kW
Avg. Demand	178.0	kW
Natural Gas		
Annual Consumption	69,714	Therms
Annual Cost	56,950	$
Unit Rate	0.817	$/therm
Water		
Annual Consumption	1,915,000	Gallons
Annual Cost	10,306	$
Unit Rate	0.005	$/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 late fall (Oct – Dec), electric usage drops due to decreased cooling needs.



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	$0.158	$0.13	Y
Natural Gas	$/Therm	$0.817	$0.96	N

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

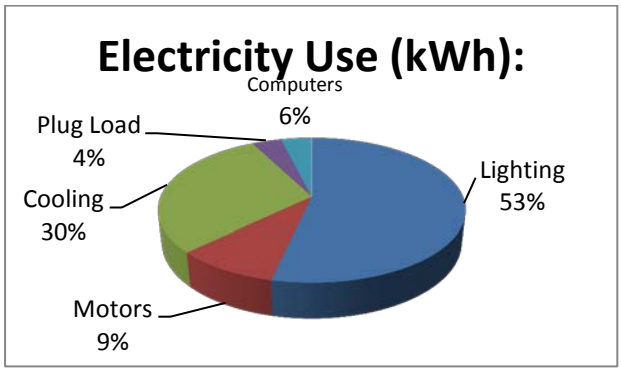
Additional information on selecting a third party energy supplier is available here:

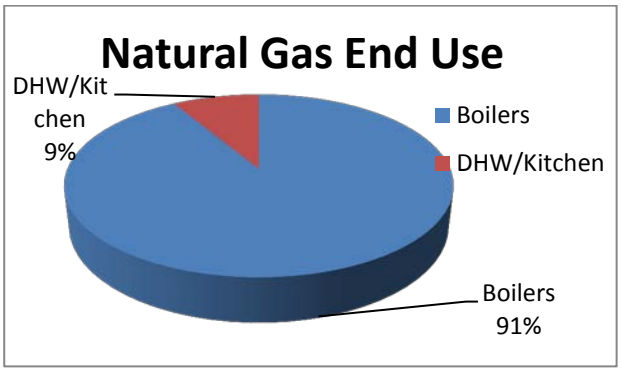
http://www.state.nj.us/bpu/commercial/shopping.html.

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.

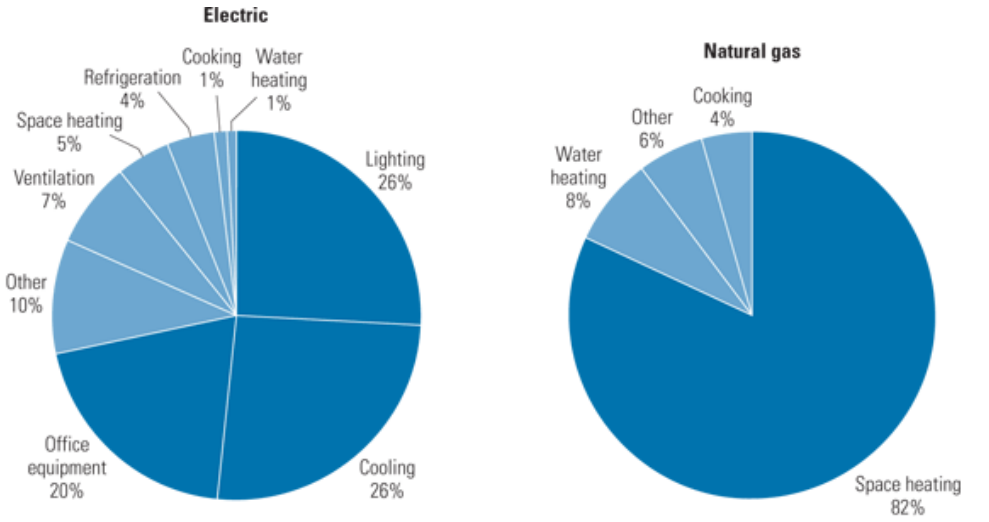
Site End-Use Utility Profile





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)
46.3	68.8	93

This school has an above average Energy Star Rating Score (50 being the median score) and is qualified for energy star certification. It is believed that Energy for America control procedures and new cooling units contribute to the lower EUI and higher energy star rating. It should also be noted that the school has installed a roof mounted photovoltaic (PV) solar system which help reduce the electric peak and usage from the grid; However, the solar electric data is not available.

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
4,089,763	0	0	15,492	12,657	(0.9)	7,000	323.1	322.6

* 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.

5.1 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
223,300	0	0	6,885	5,625	(0.2)	7,000	39.7	38.5

* 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.

5.2 ECM-2 Replace Motors in HV Units

The (12) HV units have outdated fan motors and can be replaced with modern premium efficiency motors. The units will still have the same size fans as well as cooling and heating coils. Therefore, there will be no heating or cooling savings, since the savings are derived from better motor efficiency. Savings are calculated by replacing the existing HV units supply fan motors with premium efficiency motors.

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

ECM-2 Replace Motors in HV Units

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
7,190	1	4,133	0	653	1.3	0	11.0	11.0

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

This measure is recommended.

5.3 ECM-3 Replace Pneumatic Control Devices with DDC Devices

This building has a hybrid control system which consists of an Alerton 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 3HP 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^{o}F and 78^{o}F and the unoccupied temperature is set at 85 ^{o}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 compressed air surveys 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-3 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
494,944	0	9,442	637	2,012	(0.9)	0	246.0	246.0

* 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-4 Install Window AC Controllers

There are about 40 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-4 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
8,300	0	15,741	0	2,487	3.5	0	3.3	3.3

* 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-5 Kitchen Hood Control

The kitchen contains a kitchen hood with one exhaust fan that runs continuously when the kitchen is operational. Installing a control system was evaluated and upon activation, the hood lights turn on and the fans reach a preset minimum speed of between 10 and 50 percent. The exhaust fan speed increases based on exhaust air temperature when the cooking applications are on. During actual cooking, the speed increases to 100

percent until smoke and heat are removed. The control will also send a signal to the kitchen hood make-up air fan to modulate the speed on the make-up air fan drive based on exhaust air quantity.

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

ECM-5 Kitchen Hood Control

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
32,747	0	1,344	1,644	1,555	(0.3)	0	21.1	21.1

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

This measure is recommended.

5.6 ECM-6 Install Control on the Walk-in Fridges and Freezers

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

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

ECM-6 Install Control on the Walk-in Fridges and Freezers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
22,275	0	6,225	0	984	(0.1)	0	22.6	22.6

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

This measure is recommended.

5.7.1 ECM-L1 Lighting Replacement / Upgrades

The 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
198,098	35	93,728	0	14,809	0.1	21,970	13.4	11.9

* 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.

5.7.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

Presently, the majority of the lighting in the building is controlled by manual switches. The 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
15,005	0	25,909	0	4,094	3.1	2,340	3.7	3.1

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

This measure is not recommended in lieu of ECM L3.

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

This measure is a combination of ECM-L1 and ECM-L2; recommending replace/upgrade the current lighting fixtures to more efficient ones and installing occupancy sensors on the new lights. 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
213,103	35	112,940	0	17,845	0.3	24,310	11.9	10.6

* 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.

5.8 Additional O&M Opportunities

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

- 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 installed solar photovoltaic (PV) panels on most of the available roof space in the school buildings through power purchase agreement (PPA). In this school, the PV panels have been installed on the available roof space evaluated by solar PV Company; however, the capacity (kilo-watt) of the PV system in this school is unknown due to the missing of solar PV bills.

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.

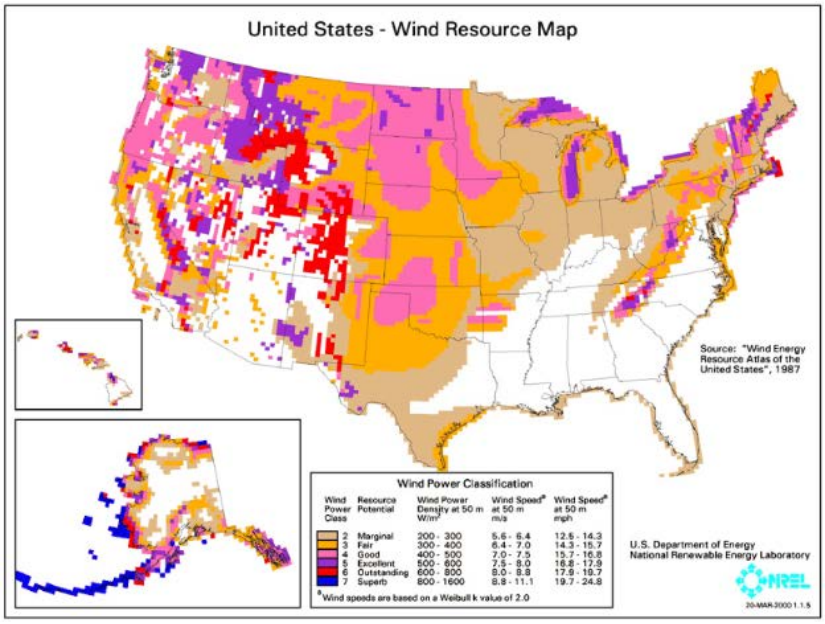
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping). 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
253.0	68.9	178.0	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 Ben Franklin Middle School.

The following projects should be considered for implementation:

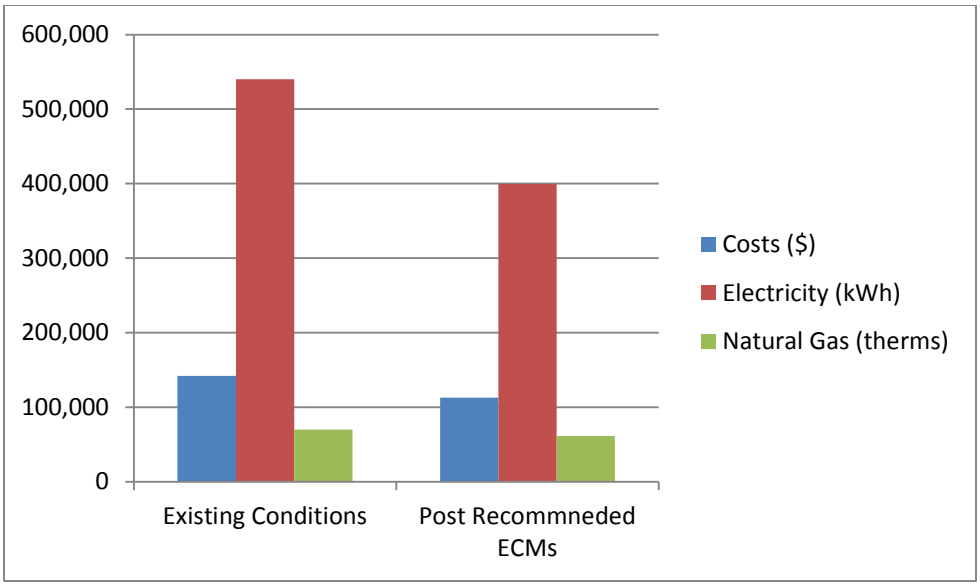
- Replace Motors in HV Units
- Install Window AC Controllers
- Install Kitchen Hood Controls
- Walk-in Cooler & Freezer EC Motor Retrofits
- Lighting Replacements / Upgrades

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)
140,384	8,529	$29,149	17.4

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	142,068	112,919	21%
Electricity (kWh)	540,125	399,741	26%
Natural Gas (therms)	69,714	61,185	12%
Site EUI (kbtu/SF/Yr)	46.3	39.3	



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

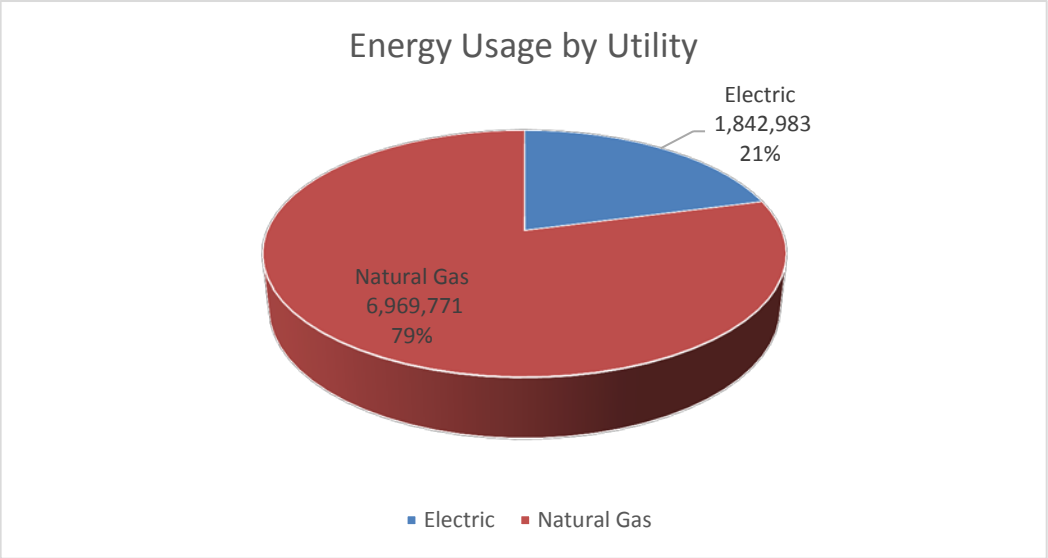
Ridgewood BOE NJBPU LGEA
Ben Franklin Middle School
335 N Van Dien Ave. Ridgewood, NJ

Annual Utilities

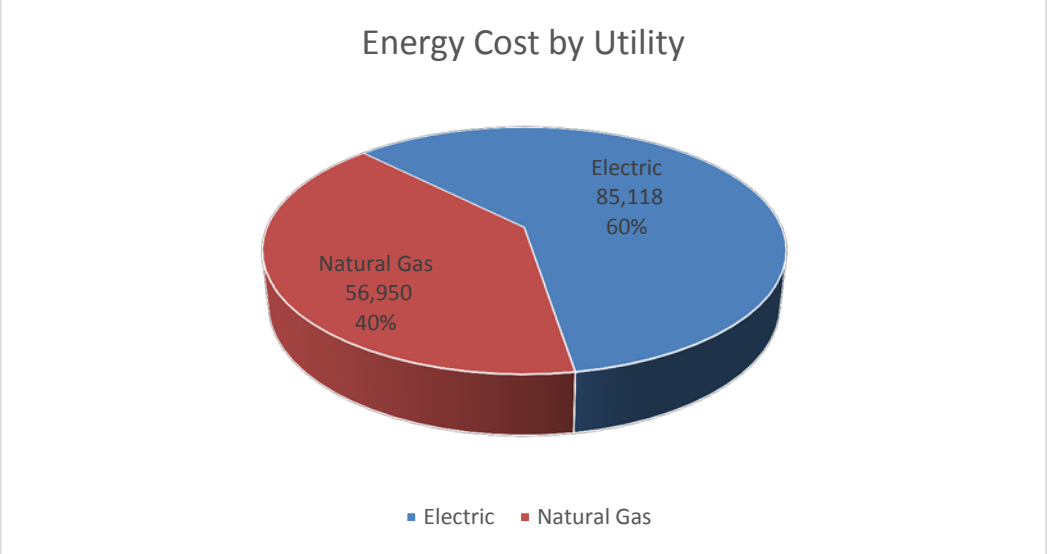
12-month Summary

Electric		
Annual Usage	540,125	kWh/yr
Annual Cost	85,118	$
Blended Rate	0.158	$/kWh
Peak Demand	253.0	kW
Min. Demand	68.9	kW
Avg. Demand	178.0	kW
Natural Gas		
Annual Usage	69,714	Therms/yr
Annual Cost	56,950	$
Rate	0.817	$/therm
Water		
Annual Usage	1,915,000	Gallons
Annual Cost	10,306	$
Rate	0.005	$/Gallon
Energy Summary		
Building Area	190,400	SF
Energy Usage Intensity (EUI)	46	KBtu/SF/yr
Energy Cost Index (ECI)	0.80	$/SF/yr
Total Annual Utility Costs	152,374	$

Utility	KBtu	%
Electric	1,842,983	21%
Natural Gas	6,969,771	79%
	8,812,754	100%



Utility	$	%
Electric	85,118	60%
Natural Gas	56,950	40%
	142,068	100%



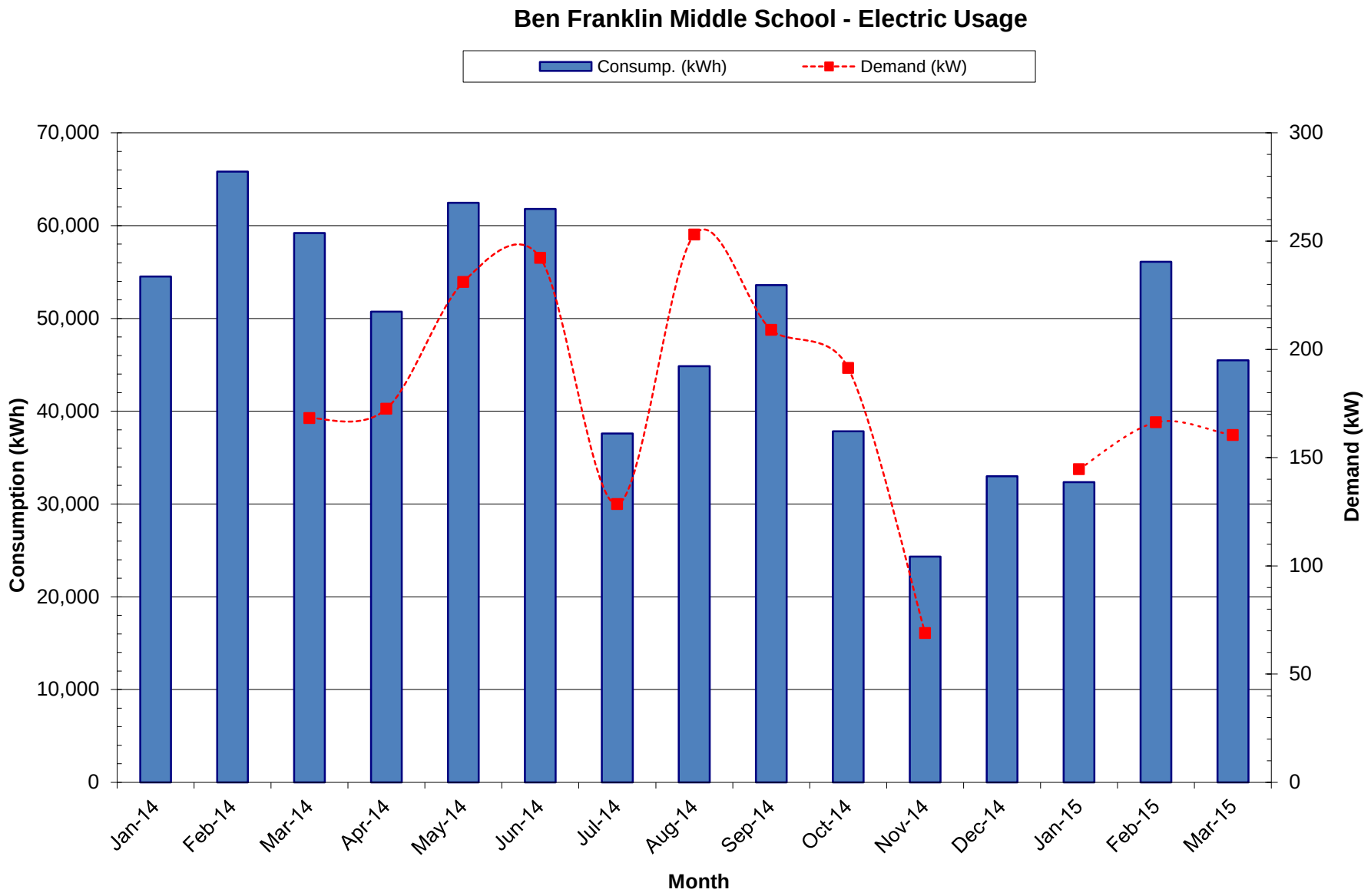
Ridgewood BOE NJBPU LGEA
Ben Franklin Middle School
335 N Van Dien Ave. Ridgewood, NJ

Electric Service

For Service at: **335 N Van Dien Ave. Ridgewood, NJ**
Account No.: **0** **Delivery:** **PSE&G**
Meter No.: **Supply:** **Energy Direct**

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs				
Month	**Consump. (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Delivery ($/kWh)**	**Supplier ($/kWh)**	**Consumption Rate ($/kWh)**	**Demand ($/kW)**	**Blended Rate ($/kWh)**
January-14	54,514		7,903.38		7,903.38	7903.38		0.145	0.000	0.145	#DIV/0!	0.145
February-14	65,817		9,218.12		9,218.12	9218.12		0.140	0.000	0.140	#DIV/0!	0.140
March-14	59,207	168.20	8,157.39		8,157.39	8157.39		0.138	0.000	0.138	0.000	0.138
April-14	50,740	172.50	6,876.01		6,876.01	6876.01		0.136	0.000	0.136	0.000	0.136
May-14	62,469	231.10	10,751.18		10,751.18	10751.18		0.172	0.000	0.172	0.000	0.172
June-14	61,801	242.20	10,779.80		10,779.80	10779.80		0.174	0.000	0.174	0.000	0.174
July-14	37,601	128.50	6,124.68		6,124.68	6124.68		0.163	0.000	0.163	0.000	0.163
August-14	44,841	253.00	8,800.12		8,800.12	8800.12		0.196	0.000	0.196	0.000	0.196
September-14	53,595	209.00	7,557.79		7,557.79	7557.79		0.141	0.000	0.141	0.000	0.141
October-14	37,834	191.40	5,618.52		5,618.52	5618.52		0.149	0.000	0.149	0.000	0.149
November-14	24,323	68.90	3,523.25		3,523.25	3523.25		0.145	0.000	0.145	0.000	0.145
December-14	32,979		5,202.03		5,202.03	5202.03		0.158	0.000	0.158	#DIV/0!	0.158
January-15	32,363	144.60	4,826.00		4,826.00	4826.00		0.149	0.000	0.149	0.000	0.149
February-15	56,094	166.30	8,327.00		8,327.00	8327.00		0.15	0.00	0.15	0.00	0.15
March-15	45,486	160.40	6,731.93		6,731.93	6731.93		0.148	0.000	0.148	0.000	0.148
Total (All)	**719,663**	**253.00**	**$110,397.20**	**$0.00**	**$110,397.20**	**$110,397.20**	**$0.00**	**$0.15**	**$0.00**	**$0.15**	**$0.00**	**$0.15**
Total (last 12-months)	**540,125**	**253.00**	**$85,118.31**	**$0.00**	**$85,118.31**	**$85,118.31**	**$0.00**	**$0.16**	**$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)

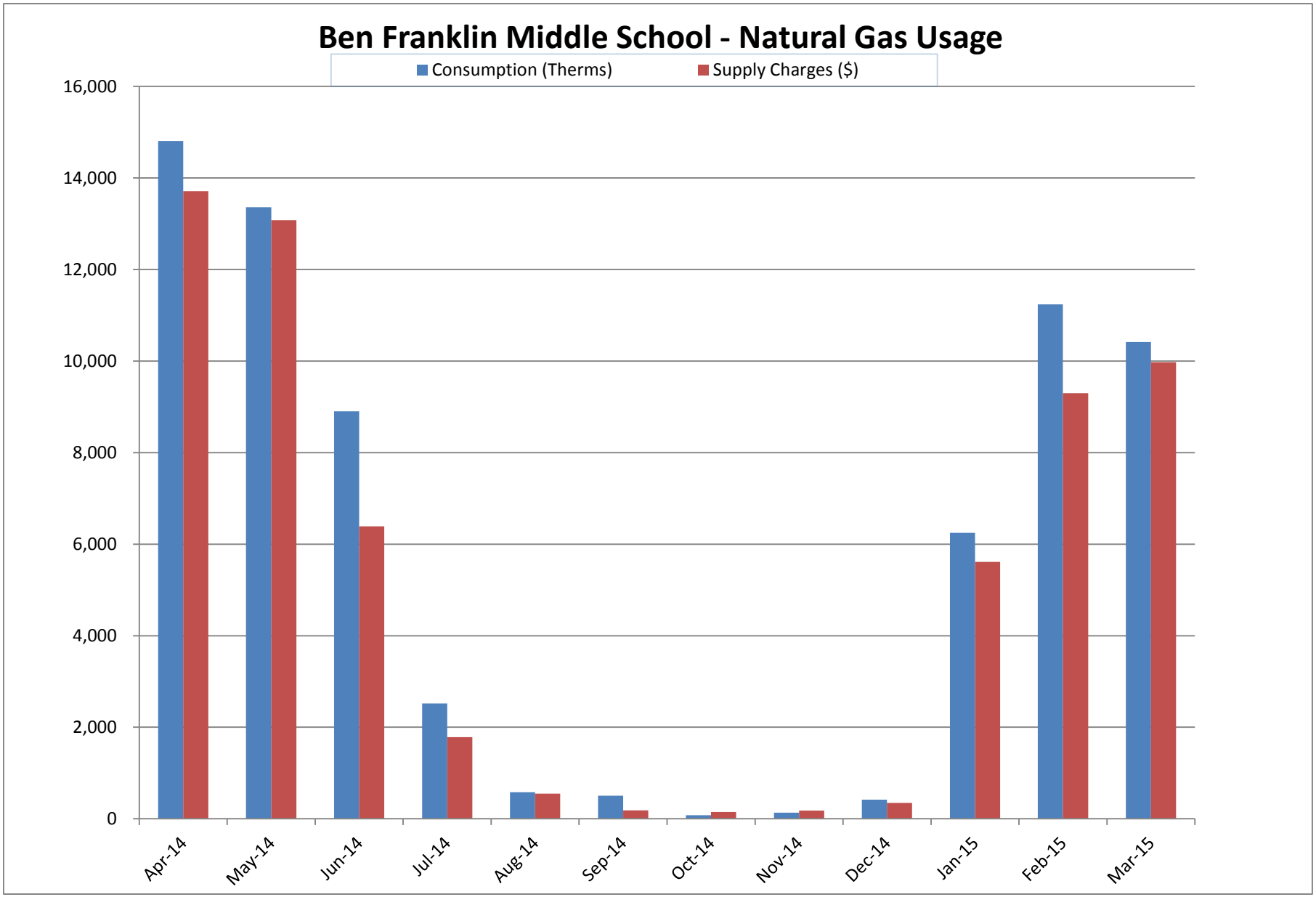

Ben Franklin Middle School - Electric Usage
Consump. (kWh)
Demand (kW)
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
300
250
200
150
100
50
0
Consumption (kWh)
Demand (kW)
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Month

Ridgewood BOE NJBPU LGEA
Ben Franklin Middle School
335 N Van Dien Ave. Ridgewood, NJ

Natural Gas Service

For Service at: 335 N Van Dien Ave. Ridgewood, NJ
Account No.: 0
Meter No:
Delivery: PSE&G
Supply: Direct Energy/South Jersey Energy/PSE&G

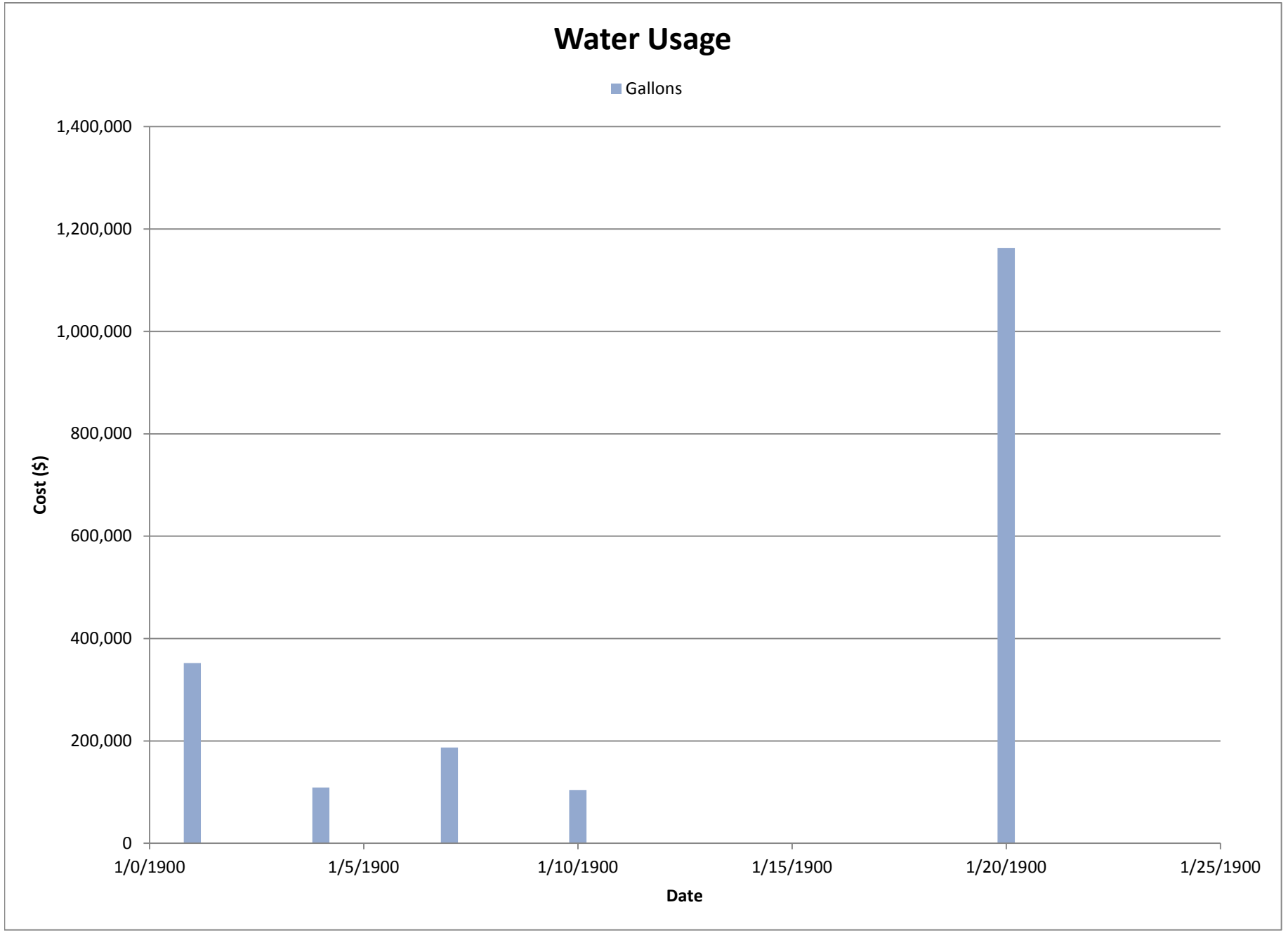
Month	Consumption (Therms)	Delivery Charges ($)	Supply Charges ($)	Total Charges ($)	Rate ($/Therm)
January-14	14,808.05	13,711.77		13,711.77	0.93
February-14	13,361.51	13,075.07		13,075.07	0.98
March-14	8,901.53	6,390.82		6,390.82	0.72
April-14	2,519.67	1,784.21		1,784.21	0.71
May-14	578.65	550.84		550.84	0.95
June-14	504.00	182.30		182.30	0.36
July-14	79.21	147.95		147.95	1.87
August-14	131.70	179.64		179.64	1.36
September-14	417.22	346.09		346.09	0.83
October-14	6,247.50	5,612.38		5,612.38	0.90
November-14	11,239.40	9,297.68		9,297.68	0.83
December-14	10,415.00	9,973.44		9,973.44	0.96
January-15	13,572.00	11,491.00		11,491.00	0.85
February-15	16,453.00	13,131.00		13,131.00	0.80
March-15	7,557.00	4,253.00		4,253.00	0.56
Total (12 Months)	**69,714**	**$ 56,949.53**	**$ 56,949.53**	**$ 56,949.53**	**$ 0.82**


Ben Franklin Middle School - Natural Gas Usage
Consumption (Therms)
Supply Charges ($)
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Apr-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15

Ridgewood BOE NJBPU LGEA
Ben Franklin Middle School
335 N Van Dien Ave. Ridgewood, NJ

For Service at:
Account No.:
Meter No.:
Water & Sewer Service **Delivery -** **Ridgewood Water**

Month	Total ($)	Gallons	$/Gallon
March-14	$ 2,001.78	352,000	$ 0.01
June-14	$ 862.11	109,000	$ 0.01
September-14	$ 1,149.02	187,000	$ 0.01
October-15	$ 5,571.44	1,163,000	$ 0.00
December-14	$ 721.69	104,000	$ 0.01
Total	**$ 10,306.04**	**1,915,000**	**$ 0.01**


Water Usage
Gallons
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Cost ($)
1/0/1900
1/5/1900
1/10/1900
1/15/1900
1/20/1900
1/25/1900
Date

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Back to main supplier information page

APPENDIX B

Equipment Inventory

CHA Project # 30237
Ben Franklin Middle 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	Kewanee Boiler Corp.	L 38-200-01	R 0372	Steam Boiler	8,370 MBH energy Input and 6,695MBH energy Output	79.9% Efficiency	Basement Mechanical Room	Entire Building	1980	-10	
DHW Heater	1	A O Smith	HW-670	1433M000149	DHW heater	660 MBH energy Input and 528MBH energy Output	80% Efficiency	Basement Mechanical Room	Entire Building	2014	24	
HV-1	1	N/A	N/A	N/A	Heating and Ventilating Unit	the fan motor is enclosed and not accessible	Unknown	Fan Room#4	Boys Locker RM	1980	-15	
HV-2	1	N/A	N/A	N/A	Heating and Ventilating Unit	the fan motor is enclosed and not accessible	Unknown	Fan Room#4	Gym	1980	-15	
HV-3	1	N/A	N/A	N/A	Heating and Ventilating Unit	2HP Fan Motor	Unknown	2nd Floor Fan Room	Café	1980	-15	
HV-4	1	N/A	N/A	N/A	Heating and Ventilating Unit	3HP Fan Motor	Unknown	2nd Floor Fan Room	Kitchen	1980	-15	
HV-5	1	N/A	N/A	N/A	Heating and Ventilating Unit	2HP Fan Motor	Unknown	2nd Floor Fan Room	Girls Locker Room	1980	-15	
HV-6	1	N/A	N/A	N/A	Heating and Ventilating Unit	3HP Fan Motor	Unknown	2nd Floor Fan Room	Teacher's Café	1980	-15	
HV-7	1	N/A	N/A	N/A	Heating and Ventilating Unit	the fan motor is enclosed and not accessible	Unknown	1st Floor Fan Room #1	1st Floor East Corridor	1980	-15	
HV-8	1	N/A	N/A	N/A	Heating and Ventilating Unit	5HP Fan Motor	Unknown	2nd Floor Fan Room	Stage Dressing Room	1980	-15	
HV-9	1	N/A	N/A	N/A	Heating and Ventilating Unit	Fade Away Nameplate Data	Unknown	2nd Floor Fan Room	1st and 2nd Floor Corridors Center	1980	-15	
HV-10	1	N/A	N/A	N/A	Heating and Ventilating Unit	Fade Away Nameplate Data	Unknown	Basement Mechanical Room	Art Room	1980	-14	
HV-11	1	N/A	N/A	N/A	Heating and Ventilating Unit	the fan motor is enclosed and not accessible	Unknown	Basement Mechanical Room	Auditorium Lobby	1980	-13	
HV-12	1	N/A	N/A	N/A	Heating and Ventilating Unit	the fan motor is enclosed and not accessible	Unknown	Basement Mechanical Room	Reas of the Auditorium	1980	-12	
RTU	1	Lennox	LGH480H4BS1Y	5610J00006	Roof top unit with DX cooling capacity and gas fired furnace for heating	40 ton cooling capacity and 400 MBH heating capacity	EER of 9.8	Roof	Auditorium	2012	33	

APPENDIX C

ECM Calculations

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle 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)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$198,098	**34.56**	**93,728**	**0**	**$14,809**	**0**	**$14,809**	**$21,970**	**13.4**	**11.9**

*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)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$15,005	**0.0**	**25,909**	**0**	**$4,094**	**0**	**$4,094**	**$2,340**	**3.7**	**3.1**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

ECM-L3 Lighting Replacements with Occupancy Sensors

Budgetary	Annual Utility Savings				Estimated	Total	New Jersey	Payback	Payback
Cost					Maintenance	Savings	Incentive	(without incentive)	(with incentive)
					Savings				
$	kW	kWh	therms	$	$	$	$	Years	Years
$213,103	**34.6**	**112,940**	**0**	**$17,845**	**0**	**$17,844**	**$24,310**	**11.9**	**10.6**

*Incentive based on New Jersey Smart Start Prescriptive Lighting Measures

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle School
CHA Project No.30237
Existing Lighting & Audit Input

Cost of Electricity: **$0.158** **$/kWh**
$/kW

			EXISTING CONDITIONS									Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Wattages Table of Standard Fixture	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
196LED	Basement - Art Room	Classrooms	27	W 32 C F 4 (ELE)	F44ILL	112	3.02	SW	2000	6,048	OCC	
46LED	Art Room	Classrooms	6	W 32 P F 2 (ELE)	F42ILL	59	0.35	SW	2000	708	OCC	
196LED	Art Room	Classrooms	7	W 32 C F 4 (ELE)	F44ILL	112	0.78	SW	2000	1,568	OCC	
196LED	Storage	Storage Areas	2	W 32 C F 4 (ELE)	F44ILL	112	0.22	SW	500	112	NONE	
46LED	Practice Room	Classrooms	2	W 32 P F 2 (ELE)	F42ILL	59	0.12	SW	2000	236	OCC	
5LED	Musical Instruments	Classrooms	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.36	SW	2000	720	OCC	
35LED	Musical Instruments	Classrooms	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.17	SW	2000	2,340	OCC	
5LED	Music Area	Classrooms	42	2T 32 R F 2 (u) (ELE)	FU2LL	60	2.52	SW	2000	5,040	OCC	
46LED	Music Area	Classrooms	4	W 32 P F 2 (ELE)	F42ILL	59	0.24	SW	2000	472	OCC	
32LED	Music Area	Classrooms	5	1T 32 R F 2 (ELE)	F42LL	60	0.30	SW	2000	600	OCC	
46LED	Music Area	Classrooms	5	W 32 P F 2 (ELE)	F42ILL	59	0.30	SW	2000	590	OCC	
232	Custodian Closet	Linen/Utility/Wet/Janitor/Electrical	7	R 60 C I 1	I60/1	60	0.42	SW	250	105	NONE	
232	Boiler Room	Boiler Room	7	R 60 C I 1	I60/1	60	0.42	SW	2000	840	NONE	
232	Boiler Room	Boiler Room	4	R 60 C I 1	I60/1	60	0.24	SW	2000	480	NONE	
72	Storage	Storage Areas	2	I 34	I34/1	34	0.07	SW	500	34	NONE	
20LED	Storage	Storage Areas	7	S 28 P F 1 (ELE)	F41ILL	31	0.22	SW	500	109	NONE	
196LED	Storage	Storage Areas	4	W 32 C F 4 (ELE)	F44ILL	112	0.45	SW	500	224	NONE	
5LED	Chorus Room B9	Classrooms	9	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.54	SW	2000	1,080	OCC	
35LED	Chorus Room B9	Classrooms	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.62	SW	2000	3,240	OCC	
46LED	Music Office	Offices	8	W 32 P F 2 (ELE)	F42ILL	59	0.47	SW	2000	944	OCC	
46LED	Chorus Room B13	Classrooms	8	W 32 P F 2 (ELE)	F42ILL	59	0.47	SW	2000	944	OCC	
46LED	Storage	Storage Areas	11	W 32 P F 2 (ELE)	F42ILL	59	0.65	SW	500	325	NONE	
46LED	Room B17	Classrooms	10	W 32 P F 2 (ELE)	F42ILL	59	0.59	SW	2000	1,180	OCC	
46LED	Room B14	Classrooms	10	W 32 P F 2 (ELE)	F42ILL	59	0.59	SW	2000	1,180	OCC	
20LED	Hallway	Hallways	13	S 28 P F 1 (ELE)	F41ILL	31	0.40	SW	8736	3,521	NONE	
72	Hallway	Hallways	2	I 34	I34/1	34	0.07	SW	8736	594	NONE	
20LED	Stairwell	Stairway	5	S 28 P F 1 (ELE)	F41ILL	31	0.16	SW	6000	930	NONE	
46LED	1st Floor - Fitness Room	Gymnasium	28	W 32 P F 2 (ELE)	F42ILL	59	1.65	SW	2000	3,304	OCC	
20LED	Boy's Locker Room	Locker	17	S 28 P F 1 (ELE)	F41ILL	31	0.53	SW	750	395	OCC	
64LED	Gym	Gymnasium	14	175 MH	MH175/1	215	3.01	SW	2000	6,020	OCC	
20LED	Girls Locker Room	Locker	17	S 28 P F 1 (ELE)	F41ILL	31	0.53	SW	750	395	OCC	
20LED	Gym Office	Offices	4	S 28 P F 1 (ELE)	F41ILL	31	0.12	SW	2000	248	OCC	
46LED	Kitchen	Kitchen	1	W 32 P F 2 (ELE)	F42ILL	59	0.06	SW	1500	89	NONE	
46LED	Kitchen	Kitchen	18	W 32 P F 2 (ELE)	F42ILL	59	1.06	SW	1500	1,593	OCC	
196LED	Kitchen Storage	Kitchen	1	W 32 C F 4 (ELE)	F44ILL	112	0.11	SW	1500	168	NONE	
20LED	Teacher's Lounge	Staff Lounge	15	S 28 P F 1 (ELE)	F41ILL	31	0.47	SW	500	233	OCC	
35LED	Cafeteria	Cafeteria	72	T 32 R F 3 (ELE)	F43ILL/2	90	6.48	SW	2000	12,960	OCC	
46LED	Room 126	Classrooms	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	2000	1,416	OCC	
46LED	Room 124	Classrooms	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	2000	1,416	OCC	
46LED	Room 122	Classrooms	12	W 32 P F 2 (ELE)	F42ILL	59	0.71	SW	2000	1,416	OCC	
20LED	Office	Offices	3	S 28 P F 1 (ELE)	F41ILL	31	0.09	SW	2000	186	OCC	
46LED	Office	Offices	2	W 32 P F 2 (ELE)	F42ILL	59	0.12	SW	2000	236	OCC	
20LED	M.R. Repairs	Classrooms	27	S 28 P F 1 (ELE)	F41ILL	31	0.84	SW	2000	1,674	OCC	
196LED	Weight Room	Gymnasium	21	W 32 C F 4 (ELE)	F44ILL	112	2.35	SW	2000	4,704	OCC	
46LED	Toilet	Restroom	4	W 32 P F 2 (ELE)	F42ILL	59	0.24	SW	2000	472	OCC	
46LED	Toilet	Restroom	4	W 32 P F 2 (ELE)	F42ILL	59	0.24	SW	2000	472	OCC	
20LED	Room 127	Classrooms	10	S 28 P F 1 (ELE)	F41ILL	31	0.31	SW	2000	620	OCC	
20LED	Hallway	Hallways	52	S 28 P F 1 (ELE)	F41ILL	31	1.61	SW	8736	14,082	NONE	
35LED	Hallway	Hallways	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.35	SW	8736	11,794	OCC	
5LED	Hallway	Hallways	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	8736	2,097	OCC	
141LED	Auditorium	Auditorium	29	HPS 200	HPS200/1	250	7.25	SW	2000	14,500	OCC	
20LED	Auditorium	Auditorium	6	S 28 P F 1 (ELE)	F41ILL	31	0.19	SW	2000	372	OCC	
20LED	Auditorium	Auditorium	18	S 28 P F 1 (ELE)	F41ILL	31	0.56	SW	2000	1,116	OCC	
5LED	Auditorium	Auditorium	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	2000	480	OCC	
20LED	Hallway	Hallways	8	S 28 P F 1 (ELE)	F41ILL	31	0.25	SW	8736	2,167	NONE	
T5	Hallway	Hallways	14	F32GL	F32GL	52	0.73	SW	8736	6,360	NONE	
234	Storage	Storage Areas	1	R 75 C I 1	i75/1	75	0.08	SW	500	38	NONE	
46LED	Storage	Storage Areas	2	W 32 P F 2 (ELE)	F42ILL	59	0.12	SW	500	59	NONE	
46LED	Room 118	Classrooms	6	W 32 P F 2 (ELE)	F42ILL	59	0.35	SW	2000	708	OCC	
T5	Guidance Room	Offices	1	F32GL	F32GL	52	0.05	SW	2000	104	OCC	
T5	Guidance Room	Offices	1	F32GL	F32GL	52	0.05	SW	2000	104	OCC	
T5	Guidance Room	Offices	1	F32GL	F32GL	52	0.05	SW	2000	104	OCC	
T5	Guidance Room	Offices	1	F32GL	F32GL	52	0.05	SW	2000	104	OCC	
T5	Guidance Room	Offices	1	F32GL	F32GL	52	0.05	SW	2000	104	OCC	
5LED	Guidance Room	Offices	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.36	SW	2000	720	OCC	
T5	CR-114	Conference	21	F32GL	F32GL	52	1.09	SW	1250	1,365	OCC	
T5	Nurse	Patient	8	F32GL	F32GL	52	0.42	SW	2000	832	OCC	
T5	Room 110	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	Room 108	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	Toilet	Restroom	2	F32GL	F32GL	52	0.10	SW	2000	208	OCC	
T5	Toilet	Restroom	2	F32GL	F32GL	52	0.10	SW	2000	208	OCC	
T5	Room 106	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	CR-104	Conference	13	F32GL	F32GL	52	0.68	SW	1250	845	OCC	

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle School
CHA Project No.30237
Existing Lighting & Audit Input

Cost of Electricity: **$0.158** **$/kWh**
$/kW

			EXISTING CONDITIONS									Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Wattages Table of Standard Fixture	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
5LED	CR-104	Conference	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	1250	300	OCC	
T5	CR-102	Conference	10	F32GL	F32GL	52	0.52	SW	1250	650	OCC	
T5	CR-102	Conference	7	F32GL	F32GL	52	0.36	SW	1250	455	OCC	
32LED	CR-101	Conference	18	1T 32 R F 2 (ELE)	F42LL	60	1.08	SW	1250	1,350	OCC	
32LED	CR-101	Conference	2	1T 32 R F 2 (ELE)	F42LL	60	0.12	SW	1250	150	OCC	
196LED	CR-101	Conference	3	W 32 C F 4 (ELE)	F44ILL	112	0.34	SW	1250	420	OCC	
32LED	Room 103	Classrooms	19	1T 32 R F 2 (ELE)	F42LL	60	1.14	SW	2000	2,280	OCC	
32LED	Room 105	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	2000	2,520	OCC	
32LED	Room 107	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	2000	2,520	OCC	
46LED	Toilet	Restroom	5	W 32 P F 2 (ELE)	F42ILL	59	0.30	SW	2000	590	OCC	
32LED	Toilet	Restroom	1	1T 32 R F 2 (ELE)	F42LL	60	0.06	SW	2000	120	OCC	
32LED	Room 111	Classrooms	21	1T 32 R F 2 (ELE)	F42LL	60	1.26	SW	2000	2,520	OCC	
T5	Office	Offices	6	F32GL	F32GL	52	0.31	SW	2000	624	OCC	
T5	Office	Offices	18	F32GL	F32GL	52	0.94	SW	2000	1,872	OCC	
T5	Office	Offices	4	F32GL	F32GL	52	0.21	SW	2000	416	OCC	
T5	Office	Offices	2	F32GL	F32GL	52	0.10	SW	2000	208	OCC	
T5	Office	Offices	2	F32GL	F32GL	52	0.10	SW	2000	208	OCC	
T5	Office	Offices	2	F32GL	F32GL	52	0.10	SW	2000	208	OCC	
T5	Office	Offices	2	F32GL	F32GL	52	0.10	SW	2000	208	OCC	
T5	Office	Offices	6	F32GL	F32GL	52	0.31	SW	2000	624	OCC	
T5	Office	Offices	1	F32GL	F32GL	52	0.05	SW	2000	104	OCC	
T5	CR-115	Conference	18	F32GL	F32GL	52	0.94	SW	1250	1,170	OCC	
T5	2nd Floor - Room 233	Classrooms	14	F32GL	F32GL	52	0.73	SW	2000	1,456	OCC	
T5	Room 231	Classrooms	12	F32GL	F32GL	52	0.62	SW	2000	1,248	OCC	
T5	Room 229	Classrooms	12	F32GL	F32GL	52	0.62	SW	2000	1,248	OCC	
T5	Room 227	Classrooms	12	F32GL	F32GL	52	0.62	SW	2000	1,248	OCC	
T5	Room 225	Classrooms	12	F32GL	F32GL	52	0.62	SW	2000	1,248	OCC	
T5	Room 223	Classrooms	12	F32GL	F32GL	52	0.62	SW	2000	1,248	OCC	
5LED	Toilet	Restroom	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	2000	240	OCC	
5LED	Toilet	Restroom	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	2000	240	OCC	
T5	Room 221	Classrooms	11	F32GL	F32GL	52	0.57	SW	2000	1,144	OCC	
T5	Room 221	Classrooms	18	F32GL	F32GL	52	0.94	SW	2000	1,872	OCC	
T5	Hallway	Hallways	52	F32GL	F32GL	52	2.70	SW	8736	23,622	NONE	
T5	Hallway	Hallways	21	F32GL	F32GL	52	1.09	SW	8736	9,540	NONE	
T5	Room 228	Classrooms	14	F32GL	F32GL	52	0.73	SW	2000	1,456	OCC	
T5	Laundry Room	Laundry	6	F32GL	F32GL	52	0.31	SW	250	78	OCC	
T5	Room 226	Classrooms	16	F32GL	F32GL	52	0.83	SW	2000	1,664	OCC	
T5	Room 224	Classrooms	8	F32GL	F32GL	52	0.42	SW	2000	832	OCC	
T5	Room 222	Classrooms	16	F32GL	F32GL	52	0.83	SW	2000	1,664	OCC	
T5	Room 220	Classrooms	16	F32GL	F32GL	52	0.83	SW	2000	1,664	OCC	
T5	Room 218	Classrooms	16	F32GL	F32GL	52	0.83	SW	2000	1,664	OCC	
T5	Hallway	Hallways	19	F32GL	F32GL	52	0.99	SW	8736	8,631	NONE	
T5	Library	General Common	20	F32GL	F32GL	52	1.04	SW	1250	1,300	OCC	
T5	Library	General Common	43	F32GL	F32GL	52	2.24	SW	1250	2,795	OCC	
72	Toilet	Restroom	2	I 34	I34/1	34	0.07	SW	2000	136	OCC	
72	Toilet	Restroom	2	I 34	I34/1	34	0.07	SW	2000	136	OCC	
T5	Room 214	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	Room 212	Classrooms	20	F32GL	F32GL	52	1.04	SW	2000	2,080	OCC	
T5	Room 212	Classrooms	10	F32GL	F32GL	52	0.52	SW	2000	1,040	OCC	
T5	Room 210	Classrooms	10	F32GL	F32GL	52	0.52	SW	2000	1,040	OCC	
T5	Room 208	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	Room 206	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
5LED	Toilet	Restroom	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	2000	240	OCC	
5LED	Toilet	Restroom	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.12	SW	2000	240	OCC	
T5	Room 204	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	Room 202	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	Room 201	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	Room 203	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
T5	Room 205	Classrooms	4	F32GL	F32GL	52	0.21	SW	2000	416	OCC	Locked
T5	Storage	Storage Areas	2	F32GL	F32GL	52	0.10	SW	500	52	NONE	Locked
T5	Room 207	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	Locked
T5	Office 209	Offices	12	F32GL	F32GL	52	0.62	SW	2000	1,248	OCC	Locked
T5	Room 211	Classrooms	21	F32GL	F32GL	52	1.09	SW	2000	2,184	OCC	
72	Storage	Storage Areas	3	I 34	I34/1	34	0.10	SW	500	51	NONE	
T5	Room 213	Classrooms	5	F32GL	F32GL	52	0.26	SW	2000	520	OCC	
T5	Room 213	Classrooms	14	F32GL	F32GL	52	0.73	SW	2000	1,456	OCC	
46LED	TV Room	Media Center	15	W 32 P F 2 (ELE)	F42ILL	59	0.89	SW	1500	1,328	OCC	
32LED	Hallway	Hallways	24	1T 32 R F 2 (ELE)	F42LL	60	1.44	SW	8736	12,580	NONE	
32LED	Hallway	Hallways	46	1T 32 R F 2 (ELE)	F42LL	60	2.76	SW	8736	24,111	NONE	
	Total		**1,726**				**105.27**			**289,149**		

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle School
CHA Project No.30237
ECM-L1 Lighting Replacements

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Annual kWh**	**Number of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Retrofit Control**	**Annual Hours**	**Annual kWh**	**Annual kWh Saved**	**Annual kW Saved**	**Annual $ Saved**	**Retrofit Cost**	**NJ Smart Start Lighting Incentive**	**Simple Payback With Out Incentive**	**Simple Payback**
Field Code	**Unique description of the location - Room number/Room name: Floor number (if applicable)**	**No. of fixtures before the retrofit**	**"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape**	**Code from Table of Standard Fixture Wattages**	**Value from Table of Standard Fixture Wattages**	**(Watts/Fixt) * (Fixt No.)**	**Pre-inst. control device**	**Estimated daily hours for the usage group**	**(kW/space) * (Annual Hours)**	**No. of fixtures after the retrofit**	**"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape**	**Code from Table of Standard Fixture Wattages**	**Value from Table of Standard Fixture Wattages**	**(Watts/Fixt) * (Number of Fixtures)**	**Retrofit control device**	**Estimated annual hours for the usage group**	**(kW/space) * (Annual Hours)**	**(Original Annual kWh) - (Retrofit Annual kWh)**	**(Original Annual kW) - (Retrofit Annual kW)**	**(kWh Saved) * ($/kWh)**	**Cost for renovations to lighting system**	**Prescriptive Lighting Measures**	**Length of time for renovations cost to be recovered**	**Length of time for renovations cost to be recovered**
196LED	Basement - Art Room	27	W 32 C F 4 (ELE)	F44ILL	112	3.0	SW	2000	6,048	27	T 74 R LED	RTLED50	50	1.4	SW	2,000	2,700	3,348	1.7	$ 528.98	$ 6,378.75	$0	12.1	12.1
46LED	Art Room	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	SW	2000	708	6	4 ft LED Tube	200732x2	30	0.2	SW	2,000	360	348	0.2	$ 54.98	$ 980.10	$0	17.8	17.8
196LED	Art Room	7	W 32 C F 4 (ELE)	F44ILL	112	0.8	SW	2000	1,568	7	T 74 R LED	RTLED50	50	0.4	SW	2,000	700	868	0.4	$ 137.14	$ 1,653.75	$0	12.1	12.1
196LED	Storage	2	W 32 C F 4 (ELE)	F44ILL	112	0.2	SW	500	112	2	T 74 R LED	RTLED50	50	0.1	SW	500	50	62	0.1	$ 9.80	$ 472.50	$0	48.2	48.2
46LED	Practice Room	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	2000	236	2	4 ft LED Tube	200732x2	30	0.1	SW	2,000	120	116	0.1	$ 18.33	$ 326.70	$0	17.8	17.8
5LED	Musical Instruments	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.4	SW	2000	720	6	2T XX R LED	2RTLED	25	0.2	SW	2,000	300	420	0.2	$ 66.36	$ 1,215.00	$300	18.3	13.8
35LED	Musical Instruments	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.2	SW	2000	2,340	13	T 59 R LED	RTLED38	38	0.5	SW	2,000	988	1,352	0.7	$ 213.62	$ 3,071.25	$650	14.4	11.3
5LED	Music Area	42	2T 32 R F 2 (u) (ELE)	FU2LL	60	2.5	SW	2000	5,040	42	2T XX R LED	2RTLED	25	1.1	SW	2,000	2,100	2,940	1.5	$ 464.52	$ 8,505.00	$2,100	18.3	13.8
46LED	Music Area	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2000	472	4	4 ft LED Tube	200732x2	30	0.1	SW	2,000	240	232	0.1	$ 36.66	$ 653.40	$0	17.8	17.8
32LED	Music Area	5	1T 32 R F 2 (ELE)	F42LL	60	0.3	SW	2000	600	5	4 ft LED Tube	200732x2	30	0.2	SW	2,000	300	300	0.2	$ 47.40	$ 1,168.50	$225	24.7	19.9
46LED	Music Area	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	SW	2000	590	5	4 ft LED Tube	200732x2	30	0.2	SW	2,000	300	290	0.1	$ 45.82	$ 816.75	$0	17.8	17.8
232	Custodian Closet	7	R 60 C I 1	I60/1	60	0.4	SW	250	105	7	CF 26	CFQ26/1-L	27	0.2	SW	250	47	58	0.2	$ 9.12	$ 141.75	$0	15.5	15.5
232	Boiler Room	7	R 60 C I 1	I60/1	60	0.4	SW	2000	840	7	CF 26	CFQ26/1-L	27	0.2	SW	2,000	378	462	0.2	$ 73.00	$ 141.75	$0	1.9	1.9
232	Boiler Room	4	R 60 C I 1	I60/1	60	0.2	SW	2000	480	4	CF 26	CFQ26/1-L	27	0.1	SW	2,000	216	264	0.1	$ 41.71	$ 81.00	$0	1.9	1.9
72	Storage	2	I 34	I34/1	34	0.1	SW	500	34	2	CF 13	CFQ13/1-L	15	0.0	SW	500	15	19	0.0	$ 3.00	$ 40.50	$0	13.5	13.5
20LED	Storage	7	S 28 P F 1 (ELE)	F41ILL	31	0.2	SW	500	109	7	4 ft LED Tube	200732x1	15	0.1	SW	500	53	56	0.1	$ 8.85	$ 1,016.40	$35	114.9	110.9
196LED	Storage	4	W 32 C F 4 (ELE)	F44ILL	112	0.4	SW	500	224	4	T 74 R LED	RTLED50	50	0.2	SW	500	100	124	0.2	$ 19.59	$ 945.00	$0	48.2	48.2
5LED	Chorus Room B9	9	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.5	SW	2000	1,080	9	2T XX R LED	2RTLED	25	0.2	SW	2,000	450	630	0.3	$ 99.54	$ 1,822.50	$450	18.3	13.8
35LED	Chorus Room B9	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2000	3,240	18	T 59 R LED	RTLED38	38	0.7	SW	2,000	1,368	1,872	0.9	$ 295.78	$ 4,252.50	$900	14.4	11.3
46LED	Music Office	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	SW	2000	944	8	4 ft LED Tube	200732x2	30	0.2	SW	2,000	480	464	0.2	$ 73.31	$ 1,306.80	$0	17.8	17.8
46LED	Chorus Room B13	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	SW	2000	944	8	4 ft LED Tube	200732x2	30	0.2	SW	2,000	480	464	0.2	$ 73.31	$ 1,306.80	$0	17.8	17.8
46LED	Storage	11	W 32 P F 2 (ELE)	F42ILL	59	0.6	SW	500	325	11	4 ft LED Tube	200732x2	30	0.3	SW	500	165	160	0.3	$ 25.20	$ 1,796.85	$0	71.3	71.3
46LED	Room B17	10	W 32 P F 2 (ELE)	F42ILL	59	0.6	SW	2000	1,180	10	4 ft LED Tube	200732x2	30	0.3	SW	2,000	600	580	0.3	$ 91.64	$ 1,633.50	$0	17.8	17.8
46LED	Room B14	10	W 32 P F 2 (ELE)	F42ILL	59	0.6	SW	2000	1,180	10	4 ft LED Tube	200732x2	30	0.3	SW	2,000	600	580	0.3	$ 91.64	$ 1,633.50	$0	17.8	17.8
20LED	Hallway	13	S 28 P F 1 (ELE)	F41ILL	31	0.4	SW	8736	3,521	13	4 ft LED Tube	200732x1	15	0.2	SW	8,736	1,704	1,817	0.2	$ 287.10	$ 1,887.60	$65	6.6	6.3
72	Hallway	2	I 34	I34/1	34	0.1	SW	8736	594	2	CF 13	CFQ13/1-L	15	0.0	SW	8,736	262	332	0.0	$ 52.45	$ 40.50	$0	0.8	0.8
20LED	Stairwell	5	S 28 P F 1 (ELE)	F41ILL	31	0.2	SW	6000	930	5	4 ft LED Tube	200732x1	15	0.1	SW	6,000	450	480	0.1	$ 75.84	$ 726.00	$25	9.6	9.2
46LED	1st Floor - Fitness Room	28	W 32 P F 2 (ELE)	F42ILL	59	1.7	SW	2000	3,304	28	4 ft LED Tube	200732x2	30	0.8	SW	2,000	1,680	1,624	0.8	$ 256.59	$ 4,573.80	$0	17.8	17.8
20LED	Boy's Locker Room	17	S 28 P F 1 (ELE)	F41ILL	31	0.5	SW	750	395	17	4 ft LED Tube	200732x1	15	0.3	SW	750	191	204	0.3	$ 32.23	$ 2,468.40	$85	76.6	73.9
64LED	Gym	14	175 MH	MH175/1	215	3.0	SW	2000	6,020	14	BAYLED78W	BAYLED78W	93	1.3	SW	2,000	2,604	3,416	1.7	$ 539.73	$ 11,818.74	$0	21.9	21.9
20LED	Girls Locker Room	17	S 28 P F 1 (ELE)	F41ILL	31	0.5	SW	750	395	17	4 ft LED Tube	200732x1	15	0.3	SW	750	191	204	0.3	$ 32.23	$ 2,468.40	$85	76.6	73.9
20LED	Gym Office	4	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	2000	248	4	4 ft LED Tube	200732x1	15	0.1	SW	2,000	120	128	0.1	$ 20.22	$ 580.80	$20	28.7	27.7
46LED	Kitchen	1	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	1500	89	1	4 ft LED Tube	200732x2	30	0.0	SW	1,500	45	44	0.0	$ 6.87	$ 163.35	$0	23.8	23.8
46LED	Kitchen	18	W 32 P F 2 (ELE)	F42ILL	59	1.1	SW	1500	1,593	18	4 ft LED Tube	200732x2	30	0.5	SW	1,500	810	783	0.5	$ 123.71	$ 2,940.30	$0	23.8	23.8
196LED	Kitchen Storage	1	W 32 C F 4 (ELE)	F44ILL	112	0.1	SW	1500	168	1	T 74 R LED	RTLED50	50	0.1	SW	1,500	75	93	0.1	$ 14.69	$ 236.25	$0	16.1	16.1
20LED	Teacher's Lounge	15	S 28 P F 1 (ELE)	F41ILL	31	0.5	SW	500	233	15	4 ft LED Tube	200732x1	15	0.2	SW	500	113	120	0.2	$ 18.96	$ 2,178.00	$75	114.9	110.9
35LED	Cafeteria	72	T 32 R F 3 (ELE)	F43ILL/2	90	6.5	SW	2000	12,960	72	T 59 R LED	RTLED38	38	2.7	SW	2,000	5,472	7,488	3.7	$ 1,183.10	$ 17,010.00	$3,600	14.4	11.3
46LED	Room 126	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	SW	2000	1,416	12	4 ft LED Tube	200732x2	30	0.4	SW	2,000	720	696	0.3	$ 109.97	$ 1,960.20	$0	17.8	17.8
46LED	Room 124	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	SW	2000	1,416	12	4 ft LED Tube	200732x2	30	0.4	SW	2,000	720	696	0.3	$ 109.97	$ 1,960.20	$0	17.8	17.8
46LED	Room 122	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	SW	2000	1,416	12	4 ft LED Tube	200732x2	30	0.4	SW	2,000	720	696	0.3	$ 109.97	$ 1,960.20	$0	17.8	17.8
20LED	Office	3	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	2000	186	3	4 ft LED Tube	200732x1	15	0.0	SW	2,000	90	96	0.0	$ 15.17	$ 435.60	$15	28.7	27.7
46LED	Office	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	2000	236	2	4 ft LED Tube	200732x2	30	0.1	SW	2,000	120	116	0.1	$ 18.33	$ 326.70	$0	17.8	17.8
20LED	M.R. Repairs	27	S 28 P F 1 (ELE)	F41ILL	31	0.8	SW	2000	1,674	27	4 ft LED Tube	200732x1	15	0.4	SW	2,000	810	864	0.4	$ 136.51	$ 3,920.40	$135	28.7	27.7
196LED	Weight Room	21	W 32 C F 4 (ELE)	F44ILL	112	2.4	SW	2000	4,704	21	T 74 R LED	RTLED50	50	1.1	SW	2,000	2,100	2,604	1.3	$ 411.43	$ 4,961.25	$0	12.1	12.1
46LED	Toilet	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2000	472	4	4 ft LED Tube	200732x2	30	0.1	SW	2,000	240	232	0.1	$ 36.66	$ 653.40	$0	17.8	17.8
46LED	Toilet	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2000	472	4	4 ft LED Tube	200732x2	30	0.1	SW	2,000	240	232	0.1	$ 36.66	$ 653.40	$0	17.8	17.8
20LED	Room 127	10	S 28 P F 1 (ELE)	F41ILL	31	0.3	SW	2000	620	10	4 ft LED Tube	200732x1	15	0.2	SW	2,000	300	320	0.2	$ 50.56	$ 1,452.00	$50	28.7	27.7
20LED	Hallway	52	S 28 P F 1 (ELE)	F41ILL	31	1.6	SW	8736	14,082	52	4 ft LED Tube	200732x1	15	0.8	SW	8,736	6,814	7,268	0.8	$ 1,148.40	$ 7,550.40	$260	6.6	6.3
35LED	Hallway	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	8736	11,794	15	T 59 R LED	RTLED38	38	0.6	SW	8,736	4,980	6,814	0.8	$ 1,076.62	$ 3,543.75	$750	3.3	2.6
5LED	Hallway	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	8736	2,097	4	2T XX R LED	2RTLED	25	0.1	SW	8,736	874	1,223	0.1	$ 193.24	$ 810.00	$200	4.2	3.2
141LED	Auditorium	29	HPS 200	HPS200/1	250	7.3	SW	2000	14,500	29	FXLED78	FXLED78/1	78	2.3	SW	2,000	4,524	9,976	5.0	$ 1,576.21	$ 24,481.67	$2,900	15.5	13.7
20LED	Auditorium	6	S 28 P F 1 (ELE)	F41ILL	31	0.2	SW	2000	372	6	4 ft LED Tube	200732x1	15	0.1	SW	2,000	180	192	0.1	$ 30.34	$ 871.20	$30	28.7	27.7
20LED	Auditorium	18	S 28 P F 1 (ELE)	F41ILL	31	0.6	SW	2000	1,116	18	4 ft LED Tube	200732x1	15	0.3	SW	2,000	540	576	0.3	$ 91.01	$ 2,613.60	$90	28.7	27.7
5LED	Auditorium	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	2000	480	4	2T XX R LED	2RTLED	25	0.1	SW	2,000	200	280	0.1	$ 44.24	$ 810.00	$200	18.3	13.8
20LED	Hallway	8	S 28 P F 1 (ELE)	F41ILL	31	0.2	SW	8736	2,167	8	4 ft LED Tube	200732x1	15	0.1	SW	8,736	1,048	1,118	0.1	$ 176.68	$ 1,161.60	$40	6.6	6.3
T5	Hallway	14	F32GL	F32GL	52	0.7	SW	8736	6,360	14	F32GL	F32GL	52	0.7	SW	8,736	6,360	-	0.0	$ -	$ -	$0		#DIV/0!
234	Storage	1	R 75 C I 1	i75/1	75	0.1	SW	500	38	1	CF 26	CFQ26/1-L	27	0.0	SW	500	14	24	0.0	$ 3.79	$ 20.25	$0	5.3	5.3
46LED	Storage	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	500	59	2	4 ft LED Tube	200732x2	30	0.1	SW	500	30	29	0.1	$ 4.58	$ 326.70	$0	71.3	71.3
46LED	Room 118	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	SW	2000	708	6	4 ft LED Tube	200732x2	30	0.2	SW	2,000	360	348	0.2	$ 54.98	$ 980.10	$0	17.8	17.8
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	SW	2,000	104	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	SW	2,000	104	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	SW	2,000	104	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	SW	2,000	104	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	SW	2,000	104	-	0.0	$ -	$ -	$0		#DIV/0!
5LED	Guidance Room	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.4	SW	2000	720	6	2T XX R LED	2RTLED	25	0.2	SW	2,000	300	420	0.2	$ 66.36	$ 1,215.00	$300	18.3	13.8
T5	CR-114	21	F32GL	F32GL	52	1.1	SW	1250	1,365	21	F32GL	F32GL	52	1.1	SW	1,250	1,365	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Nurse	8	F32GL	F32GL	52	0.4	SW	2000	832	8	F32GL	F32GL	52	0.4	SW	2,000	832	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 110	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 108	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Toilet	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	SW	2,000	208	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Toilet	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	SW	2,000	208	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 106	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	CR-104	13	F32GL	F32GL	52	0.7	SW	1250	845	13	F32GL	F32GL	52	0.7	SW	1,250	845	-	0.0	$ -	$ -	$0		#DIV/0!
5LED	CR-104	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	1250	300	4	2T XX R LED	2RTLED	25	0.1	SW	1,250	125	175	0.1	$ 27.65	$ 810.00	$200	29.3	22.1
T5	CR-102	10	F32GL	F32GL	52	0.5	SW	1250	650	10	F32GL	F32GL	52	0.5	SW	1,250	650	-	0.0	$ -	$ -	$0		#DIV/0!
T5	CR-102	7	F32GL	F32GL	52	0.4	SW	1250	455	7	F32GL	F32GL	52	0.4	SW	1,250	455	-	0.0	$ -	$ -	$0		#DIV/0!
32LED	CR-101	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	SW	1250	1,350	18	4 ft LED Tube	200732x2	30	0.5	SW	1,250	675	675	0.5	$ 106.65	$ 4,206.60	$810	39.4	31.8
32LED	CR-101	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	1250	150	2	4 ft LED Tube	200732x2	30	0.1	SW	1,250	75	75	0.1	$ 11.85	$ 467.40	$90	39.4	31.8
196LED	CR-101	3	W 32 C F 4 (ELE)	F44ILL	112	0.3	SW	1250	420	3	T 74 R LED	RTLED50	50	0.2	SW	1,250	188	233	0.2	$ 36.74	$ 708.75	$0	19.3	19.3
32LED	Room 103	19	1T 32 R F 2 (ELE)	F42LL	60	1.1	SW	2000	2,280	19	4 ft LED Tube	200732x2	30	0.6	SW	2,000	1,140	1,140	0.6	$ 180.12	$ 4,440.30	$855	24.7	19.9
32LED	Room 105	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	2000	2,520	21	4 ft LED Tube	200732x2	30	0.6	SW	2,000	1,260	1,260	0.6	$ 199.08	$ 4,907.70	$945	24.7	19.9
32LED	Room 107	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	2000	2,520	21	4 ft LED Tube	200732x2	30	0.6	SW	2,000	1,260	1,260	0.6	$ 199.08	$ 4,907.70	$945	24.7	19.9
46LED	Toilet	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	SW	2000	590	5	4 ft LED Tube	200732x2	30	0.2	SW	2,000	300	290	0.1	$ 45.82	$ 816.75	$0	17.8	17.8
32LED	Toilet	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2000	120	1	4 ft LED Tube	200732x2	30	0.0	SW	2,000	60	60	0.0	$ 9.48	$ 233.70	$45	24.7	19.9
32LED	Room 111	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	2000	2,520	21	4 ft LED Tube	200732x2	30	0.6	SW	2,000	1,260	1,260	0.6	$ 199.08	$ 4,907.70	$945	24.7	19.9
T5	Office	6	F32GL	F32GL	52	0.3	SW	2000	624	6	F32GL	F32GL	52	0.3	SW	2,000	624	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office	18	F32GL	F32GL	52	0.9	SW	2000	1,872	18	F32GL	F32GL	52	0.9	SW	2,000	1,872	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office	4	F32GL	F32GL	52	0.2	SW	2000	416	4	F32GL	F32GL	52	0.2	SW	2,000	416	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	SW	2,000	208	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	SW	2,000	208	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	SW	2,000	208	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	SW	2,000	208	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office	6	F32GL	F32GL	52	0.3	SW	2000	624	6	F32GL	F32GL	52	0.3	SW	2,000	624	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	SW	2,000	104	-	0.0	$ -	$ -	$0		#DIV/0!
T5	CR-115	18	F32GL	F32GL	52	0.9	SW	1250	1,170	18	F32GL	F32GL	52	0.9	SW	1,250	1,170	-	0.0	$ -	$ -	$0		#DIV/0!
T5	2nd Floor - Room 233	14	F32GL	F32GL	52	0.7	SW	2000	1,456	14	F32GL	F32GL	52	0.7	SW	2,000	1,456	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 231	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	SW	2,000	1,248	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 229	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	SW	2,000	1,248	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 227	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	SW	2,000	1,248	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 225	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	SW	2,000	1,248	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 223	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	SW	2,000	1,248	-	0.0	$ -	$ -	$0		#DIV/0!
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2000	240	2	2T XX R LED	2RTLED	25	0.1	SW	2,000	100	140	0.1	$ 22.12	$ 405.00	$100	18.3	13.8
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2000	240	2	2T XX R LED	2RTLED	25	0.1	SW	2,000	100	140	0.1	$ 22.12	$ 405.00	$100	18.3	13.8
T5	Room 221	11	F32GL	F32GL	52	0.6	SW	2000	1,144	11	F32GL	F32GL	52	0.6	SW	2,000	1,144	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 221	18	F32GL	F32GL	52	0.9	SW	2000	1,872	18	F32GL	F32GL	52	0.9	SW	2,000	1,872	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Hallway	52	F32GL	F32GL	52	2.7	SW	8736	23,622	52	F32GL	F32GL	52	2.7	SW	8,736	23,622	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Hallway	21	F32GL	F32GL	52	1.1	SW	8736	9,540	21	F32GL	F32GL	52	1.1	SW	8,736	9,540	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 228	14	F32GL	F32GL	52	0.7	SW	2000	1,456	14	F32GL	F32GL	52	0.7	SW	2,000	1,456	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Laundry Room	6	F32GL	F32GL	52	0.3	SW	250	78	6	F32GL	F32GL	52	0.3	SW	250	78	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 226	16	F32GL	F32GL	52	0.8	SW	2000	1,664	16	F32GL	F32GL	52	0.8	SW	2,000	1,664	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 224	8	F32GL	F32GL	52	0.4	SW	2000	832	8	F32GL	F32GL	52	0.4	SW	2,000	832	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 222	16	F32GL	F32GL	52	0.8	SW	2000	1,664	16	F32GL	F32GL	52	0.8	SW	2,000	1,664	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 220	16	F32GL	F32GL	52	0.8	SW	2000	1,664	16	F32GL	F32GL	52	0.8	SW	2,000	1,664	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 218	16	F32GL	F32GL	52	0.8	SW	2000	1,664	16	F32GL	F32GL	52	0.8	SW	2,000	1,664	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Hallway	19	F32GL	F32GL	52	1.0	SW	8736	8,631	19	F32GL	F32GL	52	1.0	SW	8,736	8,631	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Library	20	F32GL	F32GL	52	1.0	SW	1250	1,300	20	F32GL	F32GL	52	1.0	SW	1,250	1,300	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Library	43	F32GL	F32GL	52	2.2	SW	1250	2,795	43	F32GL	F32GL	52	2.2	SW	1,250	2,795	-	0.0	$ -	$ -	$0		#DIV/0!
72	Toilet	2	I 34	I34/1	34	0.1	SW	2000	136	2	CF 13	CFQ13/1-L	15	0.0	SW	2,000	60	76	0.0	$ 12.01	$ 40.50	$0	3.4	3.4
72	Toilet	2	I 34	I34/1	34	0.1	SW	2000	136	2	CF 13	CFQ13/1-L	15	0.0	SW	2,000	60	76	0.0	$ 12.01	$ 40.50	$0	3.4	3.4
T5	Room 214	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 212	20	F32GL	F32GL	52	1.0	SW	2000	2,080	20	F32GL	F32GL	52	1.0	SW	2,000	2,080	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 212	10	F32GL	F32GL	52	0.5	SW	2000	1,040	10	F32GL	F32GL	52	0.5	SW	2,000	1,040	-	0.0	$ -	$ -	$0		#DIV/0!

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle School
CHA Project No.30237
ECM-L1 Lighting Replacements

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
T5	Room 210	10	F32GL	F32GL	52	0.5	SW	2000	1,040	10	F32GL	F32GL	52	0.5	SW	2,000	1,040	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 208	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 206	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2000	240	2	2T XX R LED	2RTLED	25	0.1	SW	2,000	100	140	0.1	$ 22.12	$ 405.00	$100	18.3	13.8
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2000	240	2	2T XX R LED	2RTLED	25	0.1	SW	2,000	100	140	0.1	$ 22.12	$ 405.00	$100	18.3	13.8
T5	Room 204	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 202	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 201	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 203	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 205	4	F32GL	F32GL	52	0.2	SW	2000	416	4	F32GL	F32GL	52	0.2	SW	2,000	416	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Storage	2	F32GL	F32GL	52	0.1	SW	500	52	2	F32GL	F32GL	52	0.1	SW	500	52	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 207	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Office 209	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	SW	2,000	1,248	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 211	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	SW	2,000	2,184	-	0.0	$ -	$ -	$0		#DIV/0!
72	Storage	3	I 34	I34/1	34	0.1	SW	500	51	3	CF 13	CFQ13/1-L	15	0.0	SW	500	23	29	0.1	$ 4.50	$ 60.75	$0	13.5	13.5
T5	Room 213	5	F32GL	F32GL	52	0.3	SW	2000	520	5	F32GL	F32GL	52	0.3	SW	2,000	520	-	0.0	$ -	$ -	$0		#DIV/0!
T5	Room 213	14	F32GL	F32GL	52	0.7	SW	2000	1,456	14	F32GL	F32GL	52	0.7	SW	2,000	1,456	-	0.0	$ -	$ -	$0		#DIV/0!
46LED	TV Room	15	W 32 P F 2 (ELE)	F42LL	59	0.9	SW	1500	1,328	15	4 ft LED Tube	200732x2	30	0.5	SW	1,500	675	653	0.4	$ 103.10	$ 2,450.25	$0	23.8	23.8
32LED	Hallway	24	1T 32 R F 2 (ELE)	F42LL	60	1.4	SW	8736	12,580	24	4 ft LED Tube	200732x2	30	0.7	SW	8,736	6,290	6,290	0.7	$ 993.81	$ 5,608.80	$1,080	5.6	4.6
32LED	Hallway	46	1T 32 R F 2 (ELE)	F42LL	60	2.8	SW	8736	24,111	46	4 ft LED Tube	200732x2	30	1.4	SW	8,736	12,056	12,056	1.4	$ 1,904.80	$ 10,750.20	$2,070	5.6	4.6
	Total	**1,726**				**105.3**			**289,149**	**1,726**			**5,577**	**70.7**			**195,422**	**93,728**	**34.6**	**$14,809**	**$198,098**	**$21,970**		
																	Demand Savings			**34.6**	**$0**			

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle School
CHA Project No.30237
ECM-L2 Install Occupancy Sensors

		EXISTING CONDITIONS					RETROFIT CONDITIONS				COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**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**
196LED	Basement - Art Room	27	W 32 C F 4 (ELE)	F44ILL	112	3.0	3.0	OCC	1600	4,838.4	1,209.6	0.0	$191.12	$128.25	$20.00	0.7	0.6
46LED	Art Room	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	0.4	OCC	1600	566.4	141.6	0.0	$22.37	$128.25	$20.00	5.7	4.8
196LED	Art Room	7	W 32 C F 4 (ELE)	F44ILL	112	0.8	0.8	OCC	1600	1,254.4	313.6	0.0	$49.55	$128.25	$20.00	2.6	2.2
196LED	Storage	2	W 32 C F 4 (ELE)	F44ILL	112	0.2	0.2	NONE	500	112.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
46LED	Practice Room	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	OCC	1600	188.8	47.2	0.0	$7.46	$128.25	$20.00	17.2	14.5
5LED	Musical Instruments	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.4	0.4	OCC	1600	576.0	144.0	0.0	$22.75	$128.25	$20.00	5.6	4.8
35LED	Musical Instruments	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.2	1.2	OCC	1600	1,872.0	468.0	0.0	$73.94	$128.25	$20.00	1.7	1.5
5LED	Music Area	42	2T 32 R F 2 (u) (ELE)	FU2LL	60	2.5	2.5	OCC	1600	4,032.0	1,008.0	0.0	$159.26	$128.25	$20.00	0.8	0.7
46LED	Music Area	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	0.2	OCC	1600	377.6	94.4	0.0	$14.92	$128.25	$20.00	8.6	7.3
32LED	Music Area	5	1T 32 R F 2 (ELE)	F42LL	60	0.3	0.3	OCC	1600	480.0	120.0	0.0	$18.96	$128.25	$20.00	6.8	5.7
46LED	Music Area	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	0.3	OCC	1600	472.0	118.0	0.0	$18.64	$128.25	$20.00	6.9	5.8
232	Custodian Closet	7	R 60 C I 1	I60/1	60	0.4	0.4	NONE	250	105.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
232	Boiler Room	7	R 60 C I 1	I60/1	60	0.4	0.4	NONE	2000	840.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
232	Boiler Room	4	R 60 C I 1	I60/1	60	0.2	0.2	NONE	2000	480.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
72	Storage	2	I 34	I34/1	34	0.1	0.1	NONE	500	34.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
20LED	Storage	7	S 28 P F 1 (ELE)	F41ILL	31	0.2	0.2	NONE	500	108.5	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
196LED	Storage	4	W 32 C F 4 (ELE)	F44ILL	112	0.4	0.4	NONE	500	224.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
5LED	Chorus Room B9	9	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.5	0.5	OCC	1600	864.0	216.0	0.0	$34.13	$128.25	$20.00	3.8	3.2
35LED	Chorus Room B9	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	1.6	OCC	1600	2,592.0	648.0	0.0	$102.38	$128.25	$20.00	1.3	1.1
46LED	Music Office	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	0.5	OCC	1600	755.2	188.8	0.0	$29.83	$128.25	$20.00	4.3	3.6
46LED	Chorus Room B13	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	0.5	OCC	1600	755.2	188.8	0.0	$29.83	$128.25	$20.00	4.3	3.6
46LED	Storage	11	W 32 P F 2 (ELE)	F42ILL	59	0.6	0.6	NONE	500	324.5	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
46LED	Room B17	10	W 32 P F 2 (ELE)	F42ILL	59	0.6	0.6	OCC	1600	944.0	236.0	0.0	$37.29	$128.25	$20.00	3.4	2.9
46LED	Room B14	10	W 32 P F 2 (ELE)	F42ILL	59	0.6	0.6	OCC	1600	944.0	236.0	0.0	$37.29	$128.25	$20.00	3.4	2.9
20LED	Hallway	13	S 28 P F 1 (ELE)	F41ILL	31	0.4	0.4	NONE	8736	3,520.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
72	Hallway	2	I 34	I34/1	34	0.1	0.1	NONE	8736	594.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
20LED	Stairwell	5	S 28 P F 1 (ELE)	F41ILL	31	0.2	0.2	NONE	6000	930.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
46LED	1st Floor - Fitness Room	28	W 32 P F 2 (ELE)	F42ILL	59	1.7	1.7	OCC	2000	3,304.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
20LED	Boy's Locker Room	17	S 28 P F 1 (ELE)	F41ILL	31	0.5	0.5	OCC	600	316.2	79.1	0.0	$12.49	$128.25	$20.00	10.3	8.7
64LED	Gym	14	175 MH	MH175/1	215	3.0	3.0	OCC	2000	6,020.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
20LED	Girls Locker Room	17	S 28 P F 1 (ELE)	F41ILL	31	0.5	0.5	OCC	600	316.2	79.1	0.0	$12.49	$128.25	$20.00	10.3	8.7
20LED	Gym Office	4	S 28 P F 1 (ELE)	F41ILL	31	0.1	0.1	OCC	1600	198.4	49.6	0.0	$7.84	$128.25	$20.00	16.4	13.8
46LED	Kitchen	1	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	NONE	1500	88.5	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
46LED	Kitchen	18	W 32 P F 2 (ELE)	F42ILL	59	1.1	1.1	OCC	1500	1,593.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
196LED	Kitchen Storage	1	W 32 C F 4 (ELE)	F44ILL	112	0.1	0.1	NONE	1500	168.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
20LED	Teacher's Lounge	15	S 28 P F 1 (ELE)	F41ILL	31	0.5	0.5	OCC	400	186.0	46.5	0.0	$7.35	$128.25	$20.00	17.5	14.7
35LED	Cafeteria	72	T 32 R F 3 (ELE)	F43ILL/2	90	6.5	6.5	OCC	2000	12,960.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
46LED	Room 126	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	0.7	OCC	1600	1,132.8	283.2	0.0	$44.75	$128.25	$20.00	2.9	2.4
46LED	Room 124	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	0.7	OCC	1600	1,132.8	283.2	0.0	$44.75	$128.25	$20.00	2.9	2.4
46LED	Room 122	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	0.7	OCC	1600	1,132.8	283.2	0.0	$44.75	$128.25	$20.00	2.9	2.4
20LED	Office	3	S 28 P F 1 (ELE)	F41ILL	31	0.1	0.1	OCC	1600	148.8	37.2	0.0	$5.88	$128.25	$20.00	21.8	18.4
46LED	Office	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	OCC	1600	188.8	47.2	0.0	$7.46	$128.25	$20.00	17.2	14.5
20LED	M.R. Repairs	27	S 28 P F 1 (ELE)	F41ILL	31	0.8	0.8	OCC	1600	1,339.2	334.8	0.0	$52.90	$128.25	$20.00	2.4	2.0
196LED	Weight Room	21	W 32 C F 4 (ELE)	F44ILL	112	2.4	2.4	OCC	2000	4,704.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
46LED	Toilet	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	0.2	OCC	1600	377.6	94.4	0.0	$14.92	$128.25	$20.00	8.6	7.3
46LED	Toilet	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	0.2	OCC	1600	377.6	94.4	0.0	$14.92	$128.25	$20.00	8.6	7.3
20LED	Room 127	10	S 28 P F 1 (ELE)	F41ILL	31	0.3	0.3	OCC	1600	496.0	124.0	0.0	$19.59	$128.25	$20.00	6.5	5.5
20LED	Hallway	52	S 28 P F 1 (ELE)	F41ILL	31	1.6	1.6	NONE	8736	14,082.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	Hallway	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	1.4	OCC	8736	11,793.6	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
5LED	Hallway	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	0.2	OCC	8736	2,096.6	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
141LED	Auditorium	29	HPS 200	HPS200/1	250	7.3	7.3	OCC	1800	13,050.0	1,450.0	0.0	$229.10	$128.25	$20.00	0.6	0.5
20LED	Auditorium	6	S 28 P F 1 (ELE)	F41ILL	31	0.2	0.2	OCC	1800	334.8	37.2	0.0	$5.88	$128.25	$20.00	21.8	18.4
20LED	Auditorium	18	S 28 P F 1 (ELE)	F41ILL	31	0.6	0.6	OCC	1800	1,004.4	111.6	0.0	$17.63	$128.25	$20.00	7.3	6.1
5LED	Auditorium	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	0.2	OCC	1800	432.0	48.0	0.0	$7.58	$128.25	$20.00	16.9	14.3
20LED	Hallway	8	S 28 P F 1 (ELE)	F41ILL	31	0.2	0.2	NONE	8736	2,166.5	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
T5	Hallway	14	F32GL	F32GL	52	0.7	0.7	NONE	8736	6,359.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
234	Storage	1	R 75 C I 1	i75/1	75	0.1	0.1	NONE	500	37.5	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
46LED	Storage	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	0.1	NONE	500	59.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
46LED	Room 118	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	0.4	OCC	1600	566.4	141.6	0.0	$22.37	$128.25	$20.00	5.7	4.8
T5	Guidance Room	1	F32GL	F32GL	52	0.1	0.1	OCC	1600	83.2	20.8	0.0	$3.29	$128.25	$20.00	39.0	32.9
T5	Guidance Room	1	F32GL	F32GL	52	0.1	0.1	OCC	1600	83.2	20.8	0.0	$3.29	$128.25	$20.00	39.0	32.9
T5	Guidance Room	1	F32GL	F32GL	52	0.1	0.1	OCC	1600	83.2	20.8	0.0	$3.29	$128.25	$20.00	39.0	32.9
T5	Guidance Room	1	F32GL	F32GL	52	0.1	0.1	OCC	1600	83.2	20.8	0.0	$3.29	$128.25	$20.00	39.0	32.9
T5	Guidance Room	1	F32GL	F32GL	52	0.1	0.1	OCC	1600	83.2	20.8	0.0	$3.29	$128.25	$20.00	39.0	32.9
5LED	Guidance Room	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.4	0.4	OCC	1600	576.0	144.0	0.0	$22.75	$128.25	$20.00	5.6	4.8
T5	CR-114	21	F32GL	F32GL	52	1.1	1.1	OCC	1000	1,092.0	273.0	0.0	$43.13	$128.25	$20.00	3.0	2.5
T5	Nurse	8	F32GL	F32GL	52	0.4	0.4	OCC	1600	665.6	166.4	0.0	$26.29	$128.25	$20.00	4.9	4.1
T5	Room 110	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Room 108	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Toilet	2	F32GL	F32GL	52	0.1	0.1	OCC	1600	166.4	41.6	0.0	$6.57	$128.25	$20.00	19.5	16.5
T5	Toilet	2	F32GL	F32GL	52	0.1	0.1	OCC	1600	166.4	41.6	0.0	$6.57	$128.25	$20.00	19.5	16.5
T5	Room 106	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	CR-104	13	F32GL	F32GL	52	0.7	0.7	OCC	1000	676.0	169.0	0.0	$26.70	$128.25	$20.00	4.8	4.1
5LED	CR-104	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	0.2	OCC	1000	240.0	60.0	0.0	$9.48	$128.25	$20.00	13.5	11.4
T5	CR-102	10	F32GL	F32GL	52	0.5	0.5	OCC	1000	520.0	130.0	0.0	$20.54	$128.25	$20.00	6.2	5.3
T5	CR-102	7	F32GL	F32GL	52	0.4	0.4	OCC	1000	364.0	91.0	0.0	$14.38	$128.25	$20.00	8.9	7.5
32LED	CR-101	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	1.1	OCC	1000	1,080.0	270.0	0.0	$42.66	$128.25	$20.00	3.0	2.5
32LED	CR-101	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	0.1	OCC	1000	120.0	30.0	0.0	$4.74	$128.25	$20.00	27.1	22.8
196LED	CR-101	3	W 32 C F 4 (ELE)	F44ILL	112	0.3	0.3	OCC	1000	336.0	84.0	0.0	$13.27	$128.25	$20.00	9.7	8.2
32LED	Room 103	19	1T 32 R F 2 (ELE)	F42LL	60	1.1	1.1	OCC	1600	1,824.0	456.0	0.0	$72.05	$128.25	$20.00	1.8	1.5
32LED	Room 105	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	1.3	OCC	1600	2,016.0	504.0	0.0	$79.63	$128.25	$20.00	1.6	1.4
32LED	Room 107	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	1.3	OCC	1600	2,016.0	504.0	0.0	$79.63	$128.25	$20.00	1.6	1.4
46LED	Toilet	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	0.3	OCC	1600	472.0	118.0	0.0	$18.64	$128.25	$20.00	6.9	5.8
32LED	Toilet	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	0.1	OCC	1600	96.0	24.0	0.0	$3.79	$128.25	$20.00	33.8	28.5

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle School
CHA Project No.30237
ECM-L2 Install Occupancy Sensors

		EXISTING CONDITIONS					RETROFIT CONDITIONS				COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**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**
32LED	Room 111	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	1.3	OCC	1600	2,016.0	504.0	0.0	$79.63	$128.25	$20.00	1.6	1.4
T5	Office	6	F32GL	F32GL	52	0.3	0.3	OCC	1600	499.2	124.8	0.0	$19.72	$128.25	$20.00	6.5	5.5
T5	Office	18	F32GL	F32GL	52	0.9	0.9	OCC	1600	1,497.6	374.4	0.0	$59.16	$128.25	$20.00	2.2	1.8
T5	Office	4	F32GL	F32GL	52	0.2	0.2	OCC	1600	332.8	83.2	0.0	$13.15	$128.25	$20.00	9.8	8.2
T5	Office	2	F32GL	F32GL	52	0.1	0.1	OCC	1600	166.4	41.6	0.0	$6.57	$128.25	$20.00	19.5	16.5
T5	Office	2	F32GL	F32GL	52	0.1	0.1	OCC	1600	166.4	41.6	0.0	$6.57	$128.25	$20.00	19.5	16.5
T5	Office	2	F32GL	F32GL	52	0.1	0.1	OCC	1600	166.4	41.6	0.0	$6.57	$128.25	$20.00	19.5	16.5
T5	Office	2	F32GL	F32GL	52	0.1	0.1	OCC	1600	166.4	41.6	0.0	$6.57	$128.25	$20.00	19.5	16.5
T5	Office	6	F32GL	F32GL	52	0.3	0.3	OCC	1600	499.2	124.8	0.0	$19.72	$128.25	$20.00	6.5	5.5
T5	Office	1	F32GL	F32GL	52	0.1	0.1	OCC	1600	83.2	20.8	0.0	$3.29	$128.25	$20.00	39.0	32.9
T5	CR-115	18	F32GL	F32GL	52	0.9	0.9	OCC	1000	936.0	234.0	0.0	$36.97	$128.25	$20.00	3.5	2.9
T5	2nd Floor - Room 233	14	F32GL	F32GL	52	0.7	0.7	OCC	1600	1,164.8	291.2	0.0	$46.01	$128.25	$20.00	2.8	2.4
T5	Room 231	12	F32GL	F32GL	52	0.6	0.6	OCC	1600	998.4	249.6	0.0	$39.44	$128.25	$20.00	3.3	2.7
T5	Room 229	12	F32GL	F32GL	52	0.6	0.6	OCC	1600	998.4	249.6	0.0	$39.44	$128.25	$20.00	3.3	2.7
T5	Room 227	12	F32GL	F32GL	52	0.6	0.6	OCC	1600	998.4	249.6	0.0	$39.44	$128.25	$20.00	3.3	2.7
T5	Room 225	12	F32GL	F32GL	52	0.6	0.6	OCC	1600	998.4	249.6	0.0	$39.44	$128.25	$20.00	3.3	2.7
T5	Room 223	12	F32GL	F32GL	52	0.6	0.6	OCC	1600	998.4	249.6	0.0	$39.44	$128.25	$20.00	3.3	2.7
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	0.1	OCC	1600	192.0	48.0	0.0	$7.58	$128.25	$20.00	16.9	14.3
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	0.1	OCC	1600	192.0	48.0	0.0	$7.58	$128.25	$20.00	16.9	14.3
T5	Room 221	11	F32GL	F32GL	52	0.6	0.6	OCC	1600	915.2	228.8	0.0	$36.15	$128.25	$20.00	3.5	3.0
T5	Room 221	18	F32GL	F32GL	52	0.9	0.9	OCC	1600	1,497.6	374.4	0.0	$59.16	$128.25	$20.00	2.2	1.8
T5	Hallway	52	F32GL	F32GL	52	2.7	2.7	NONE	8736	23,622.1	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
T5	Hallway	21	F32GL	F32GL	52	1.1	1.1	NONE	8736	9,539.7	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
T5	Room 228	14	F32GL	F32GL	52	0.7	0.7	OCC	1600	1,164.8	291.2	0.0	$46.01	$128.25	$20.00	2.8	2.4
T5	Laundry Room	6	F32GL	F32GL	52	0.3	0.3	OCC	250	78.0	0.0	0.0	$0.00	$128.25	$20.00		#DIV/0!
T5	Room 226	16	F32GL	F32GL	52	0.8	0.8	OCC	1600	1,331.2	332.8	0.0	$52.58	$128.25	$20.00	2.4	2.1
T5	Room 224	8	F32GL	F32GL	52	0.4	0.4	OCC	1600	665.6	166.4	0.0	$26.29	$128.25	$20.00	4.9	4.1
T5	Room 222	16	F32GL	F32GL	52	0.8	0.8	OCC	1600	1,331.2	332.8	0.0	$52.58	$128.25	$20.00	2.4	2.1
T5	Room 220	16	F32GL	F32GL	52	0.8	0.8	OCC	1600	1,331.2	332.8	0.0	$52.58	$128.25	$20.00	2.4	2.1
T5	Room 218	16	F32GL	F32GL	52	0.8	0.8	OCC	1600	1,331.2	332.8	0.0	$52.58	$128.25	$20.00	2.4	2.1
T5	Hallway	19	F32GL	F32GL	52	1.0	1.0	NONE	8736	8,631.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
T5	Library	20	F32GL	F32GL	52	1.0	1.0	OCC	1000	1,040.0	260.0	0.0	$41.08	$128.25	$20.00	3.1	2.6
T5	Library	43	F32GL	F32GL	52	2.2	2.2	OCC	1000	2,236.0	559.0	0.0	$88.32	$128.25	$20.00	1.5	1.2
72	Toilet	2	I 34	I34/1	34	0.1	0.1	OCC	1600	108.8	27.2	0.0	$4.30	$128.25	$20.00	29.8	25.2
72	Toilet	2	I 34	I34/1	34	0.1	0.1	OCC	1600	108.8	27.2	0.0	$4.30	$128.25	$20.00	29.8	25.2
T5	Room 214	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Room 212	20	F32GL	F32GL	52	1.0	1.0	OCC	1600	1,664.0	416.0	0.0	$65.73	$128.25	$20.00	2.0	1.6
T5	Room 212	10	F32GL	F32GL	52	0.5	0.5	OCC	1600	832.0	208.0	0.0	$32.86	$128.25	$20.00	3.9	3.3
T5	Room 210	10	F32GL	F32GL	52	0.5	0.5	OCC	1600	832.0	208.0	0.0	$32.86	$128.25	$20.00	3.9	3.3
T5	Room 208	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Room 206	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	0.1	OCC	1600	192.0	48.0	0.0	$7.58	$128.25	$20.00	16.9	14.3
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	0.1	OCC	1600	192.0	48.0	0.0	$7.58	$128.25	$20.00	16.9	14.3
T5	Room 204	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Room 202	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Room 201	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Room 203	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Room 205	4	F32GL	F32GL	52	0.2	0.2	OCC	1600	332.8	83.2	0.0	$13.15	$128.25	$20.00	9.8	8.2
T5	Storage	2	F32GL	F32GL	52	0.1	0.1	NONE	500	52.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
T5	Room 207	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
T5	Office 209	12	F32GL	F32GL	52	0.6	0.6	OCC	1600	998.4	249.6	0.0	$39.44	$128.25	$20.00	3.3	2.7
T5	Room 211	21	F32GL	F32GL	52	1.1	1.1	OCC	1600	1,747.2	436.8	0.0	$69.01	$128.25	$20.00	1.9	1.6
72	Storage	3	I 34	I34/1	34	0.1	0.1	NONE	500	51.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
T5	Room 213	5	F32GL	F32GL	52	0.3	0.3	OCC	1600	416.0	104.0	0.0	$16.43	$128.25	$20.00	7.8	6.6
T5	Room 213	14	F32GL	F32GL	52	0.7	0.7	OCC	1600	1,164.8	291.2	0.0	$46.01	$128.25	$20.00	2.8	2.4
46LED	TV Room	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	0.9	OCC	1200	1,062.0	265.5	0.0	$41.95	$128.25	$20.00	3.1	2.6
32LED	Hallway	24	1T 32 R F 2 (ELE)	F42LL	60	1.4	1.4	NONE	8736	12,579.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	Hallway	46	1T 32 R F 2 (ELE)	F42LL	60	2.8	2.8	NONE	8736	24,111.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
								0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
								0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
								0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
								0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
								0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
								0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
	Total	**1,726**				**105.3**	**105.3**			**263,240.49**	**25,908.90**	**0.0**	**4093.6**	**15005.3**	**2340.0**		
										Demand Savings			0.0	$0			

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle School
CHA Project No.30237
ECM-L3 Lighting Replacements with Occupancy Sensors

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
196LED	Basement - Art Room	27	W 32 C F 4 (ELE)	F44ILL	112	3.0	SW	2000	6,048	27	T 74 R LED	RTLED50	50	1.4	OCC	1,600	2,160	3,888	1.7	$ 614.30	$ 6,507.00	$ 20	10.6	10.6
46LED	Art Room	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	SW	2000	708	6	4 ft LED Tube	200732x2	30	0.2	OCC	1,600	288	420	0.2	$ 66.36	$ 1,108.35	$ 20	16.7	16.4
196LED	Art Room	7	W 32 C F 4 (ELE)	F44ILL	112	0.8	SW	2000	1,568	7	T 74 R LED	RTLED50	50	0.4	OCC	1,600	560	1,008	0.4	$ 159.26	$ 1,782.00	$ 20	11.2	11.1
196LED	Storage	2	W 32 C F 4 (ELE)	F44ILL	112	0.2	SW	500	112	2	T 74 R LED	RTLED50	50	0.1	NONE	500	50	62	0.1	$ 9.80	$ 472.50	$ -	48.2	48.2
46LED	Practice Room	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	2000	236	2	4 ft LED Tube	200732x2	30	0.1	OCC	1,600	96	140	0.1	$ 22.12	$ 454.95	$ 20	20.6	19.7
5LED	Musical Instruments	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.4	SW	2000	720	6	2T XX R LED	2RTLED	25	0.2	OCC	1,600	240	480	0.2	$ 75.84	$ 1,343.25	$ 320	17.7	13.5
35LED	Musical Instruments	13	T 32 R F 3 (ELE)	F43ILL/2	90	1.2	SW	2000	2,340	13	T 59 R LED	RTLED38	38	0.5	OCC	1,600	790	1,550	0.7	$ 244.84	$ 3,199.50	$ 670	13.1	10.3
5LED	Music Area	42	2T 32 R F 2 (u) (ELE)	FU2LL	60	2.5	SW	2000	5,040	42	2T XX R LED	2RTLED	25	1.1	OCC	1,600	1,680	3,360	1.5	$ 530.88	$ 8,633.25	$ 2,120	16.3	12.3
46LED	Music Area	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2000	472	4	4 ft LED Tube	200732x2	30	0.1	OCC	1,600	192	280	0.1	$ 44.24	$ 781.65	$ 20	17.7	17.2
32LED	Music Area	5	1T 32 R F 2 (ELE)	F42LL	60	0.3	SW	2000	600	5	4 ft LED Tube	200732x2	30	0.2	OCC	1,600	240	360	0.2	$ 56.88	$ 1,296.75	$ 245	22.8	18.5
46LED	Music Area	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	SW	2000	590	5	4 ft LED Tube	200732x2	30	0.2	OCC	1,600	240	350	0.1	$ 55.30	$ 945.00	$ 20	17.1	16.7
232	Custodian Closet	7	R 60 C I 1	I60/1	60	0.4	SW	250	105	7	CF 26	CFQ26/1-L	27	0.2	NONE	250	47	58	0.2	$ 9.12	$ 141.75	$ -	15.5	15.5
232	Boiler Room	7	R 60 C I 1	I60/1	60	0.4	SW	2000	840	7	CF 26	CFQ26/1-L	27	0.2	NONE	2,000	378	462	0.2	$ 73.00	$ 141.75	$ -	1.9	1.9
232	Boiler Room	4	R 60 C I 1	I60/1	60	0.2	SW	2000	480	4	CF 26	CFQ26/1-L	27	0.1	NONE	2,000	216	264	0.1	$ 41.71	$ 81.00	$ -	1.9	1.9
72	Storage	2	I 34	I34/1	34	0.1	SW	500	34	2	CF 13	CFQ13/1-L	15	0.0	NONE	500	15	19	0.0	$ 3.00	$ 40.50	$ -	13.5	13.5
20LED	Storage	7	S 28 P F 1 (ELE)	F41ILL	31	0.2	SW	500	109	7	4 ft LED Tube	200732x1	15	0.1	NONE	500	53	56	0.1	$ 8.85	$ 1,016.40	$ 35	114.9	110.9
196LED	Storage	4	W 32 C F 4 (ELE)	F44ILL	112	0.4	SW	500	224	4	T 74 R LED	RTLED50	50	0.2	NONE	500	100	124	0.2	$ 19.59	$ 945.00	$ -	48.2	48.2
5LED	Chorus Room B9	9	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.5	SW	2000	1,080	9	2T XX R LED	2RTLED	25	0.2	OCC	1,600	360	720	0.3	$ 113.76	$ 1,950.75	$ 470	17.1	13.0
35LED	Chorus Room B9	18	T 32 R F 3 (ELE)	F43ILL/2	90	1.6	SW	2000	3,240	18	T 59 R LED	RTLED38	38	0.7	OCC	1,600	1,094	2,146	0.9	$ 339.00	$ 4,380.75	$ 920	12.9	10.2
46LED	Music Office	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	SW	2000	944	8	4 ft LED Tube	200732x2	30	0.2	OCC	1,600	384	560	0.2	$ 88.48	$ 1,435.05	$ 20	16.2	16.0
46LED	Chorus Room B13	8	W 32 P F 2 (ELE)	F42ILL	59	0.5	SW	2000	944	8	4 ft LED Tube	200732x2	30	0.2	OCC	1,600	384	560	0.2	$ 88.48	$ 1,435.05	$ 20	16.2	16.0
46LED	Storage	11	W 32 P F 2 (ELE)	F42ILL	59	0.6	SW	500	325	11	4 ft LED Tube	200732x2	30	0.3	NONE	500	165	160	0.3	$ 25.20	$ 1,796.85	$ -	71.3	71.3
46LED	Room B17	10	W 32 P F 2 (ELE)	F42ILL	59	0.6	SW	2000	1,180	10	4 ft LED Tube	200732x2	30	0.3	OCC	1,600	480	700	0.3	$ 110.60	$ 1,761.75	$ 20	15.9	15.7
46LED	Room B14	10	W 32 P F 2 (ELE)	F42ILL	59	0.6	SW	2000	1,180	10	4 ft LED Tube	200732x2	30	0.3	OCC	1,600	480	700	0.3	$ 110.60	$ 1,761.75	$ 20	15.9	15.7
20LED	Hallway	13	S 28 P F 1 (ELE)	F41ILL	31	0.4	SW	8736	3,521	13	4 ft LED Tube	200732x1	15	0.2	NONE	8,736	1,704	1,817	0.2	$ 287.10	$ 1,887.60	$ 65	6.6	6.3
72	Hallway	2	I 34	I34/1	34	0.1	SW	8736	594	2	CF 13	CFQ13/1-L	15	0.0	NONE	8,736	262	332	0.0	$ 52.45	$ 40.50	$ -	0.8	0.8
20LED	Stairwell	5	S 28 P F 1 (ELE)	F41ILL	31	0.2	SW	6000	930	5	4 ft LED Tube	200732x1	15	0.1	NONE	6,000	450	480	0.1	$ 75.84	$ 726.00	$ 25	9.6	9.2
46LED	1st Floor - Fitness Room	28	W 32 P F 2 (ELE)	F42ILL	59	1.7	SW	2000	3,304	28	4 ft LED Tube	200732x2	30	0.8	OCC	2,000	1,680	1,624	0.8	$ 256.59	$ 4,702.05	$ 20	18.3	18.2
20LED	Boy's Locker Room	17	S 28 P F 1 (ELE)	F41ILL	31	0.5	SW	750	395	17	4 ft LED Tube	200732x1	15	0.3	OCC	600	153	242	0.3	$ 38.28	$ 2,596.65	$ 105	67.8	65.1
64LED	Gym	14	175 MH	MH175/1	215	3.0	SW	2000	6,020	14	BAYLED78W	BAYLED78W	93	1.3	OCC	2,000	2,604	3,416	1.7	$ 539.73	$ 11,946.99	$ 20	22.1	22.1
20LED	Girls Locker Room	17	S 28 P F 1 (ELE)	F41ILL	31	0.5	SW	750	395	17	4 ft LED Tube	200732x1	15	0.3	OCC	600	153	242	0.3	$ 38.28	$ 2,596.65	$ 105	67.8	65.1
20LED	Gym Office	4	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	2000	248	4	4 ft LED Tube	200732x1	15	0.1	OCC	1,600	96	152	0.1	$ 24.02	$ 709.05	$ 40	29.5	27.9
46LED	Kitchen	1	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	1500	89	1	4 ft LED Tube	200732x2	30	0.0	NONE	1,500	45	44	0.0	$ 6.87	$ 163.35	$ -	23.8	23.8
46LED	Kitchen	18	W 32 P F 2 (ELE)	F42ILL	59	1.1	SW	1500	1,593	18	4 ft LED Tube	200732x2	30	0.5	OCC	1,500	810	783	0.5	$ 123.71	$ 3,068.55	$ 20	24.8	24.6
196LED	Kitchen Storage	1	W 32 C F 4 (ELE)	F44ILL	112	0.1	SW	1500	168	1	T 74 R LED	RTLED50	50	0.1	NONE	1,500	75	93	0.1	$ 14.69	$ 236.25	$ -	16.1	16.1
20LED	Teacher's Lounge	15	S 28 P F 1 (ELE)	F41ILL	31	0.5	SW	500	233	15	4 ft LED Tube	200732x1	15	0.2	OCC	400	90	143	0.2	$ 22.52	$ 2,306.25	$ 95	102.4	98.2
35LED	Cafeteria	72	T 32 R F 3 (ELE)	F43ILL/2	90	6.5	SW	2000	12,960	72	T 59 R LED	RTLED38	38	2.7	OCC	2,000	5,472	7,488	3.7	$ 1,183.10	$ 17,138.25	$ 3,620	14.5	11.4
46LED	Room 126	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	SW	2000	1,416	12	4 ft LED Tube	200732x2	30	0.4	OCC	1,600	576	840	0.3	$ 132.72	$ 2,088.45	$ 20	15.7	15.6
46LED	Room 124	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	SW	2000	1,416	12	4 ft LED Tube	200732x2	30	0.4	OCC	1,600	576	840	0.3	$ 132.72	$ 2,088.45	$ 20	15.7	15.6
46LED	Room 122	12	W 32 P F 2 (ELE)	F42ILL	59	0.7	SW	2000	1,416	12	4 ft LED Tube	200732x2	30	0.4	OCC	1,600	576	840	0.3	$ 132.72	$ 2,088.45	$ 20	15.7	15.6
20LED	Office	3	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	2000	186	3	4 ft LED Tube	200732x1	15	0.0	OCC	1,600	72	114	0.0	$ 18.01	$ 563.85	$ 35	31.3	29.4
46LED	Office	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	2000	236	2	4 ft LED Tube	200732x2	30	0.1	OCC	1,600	96	140	0.1	$ 22.12	$ 454.95	$ 20	20.6	19.7
20LED	M.R. Repairs	27	S 28 P F 1 (ELE)	F41ILL	31	0.8	SW	2000	1,674	27	4 ft LED Tube	200732x1	15	0.4	OCC	1,600	648	1,026	0.4	$ 162.11	$ 4,048.65	$ 155	25.0	24.0
196LED	Weight Room	21	W 32 C F 4 (ELE)	F44ILL	112	2.4	SW	2000	4,704	21	T 74 R LED	RTLED50	50	1.1	OCC	2,000	2,100	2,604	1.3	$ 411.43	$ 5,089.50	$ 20	12.4	12.3
46LED	Toilet	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2000	472	4	4 ft LED Tube	200732x2	30	0.1	OCC	1,600	192	280	0.1	$ 44.24	$ 781.65	$ 20	17.7	17.2
46LED	Toilet	4	W 32 P F 2 (ELE)	F42ILL	59	0.2	SW	2000	472	4	4 ft LED Tube	200732x2	30	0.1	OCC	1,600	192	280	0.1	$ 44.24	$ 781.65	$ 20	17.7	17.2
20LED	Room 127	10	S 28 P F 1 (ELE)	F41ILL	31	0.3	SW	2000	620	10	4 ft LED Tube	200732x1	15	0.2	OCC	1,600	240	380	0.2	$ 60.04	$ 1,580.25	$ 70	26.3	25.2
20LED	Hallway	52	S 28 P F 1 (ELE)	F41ILL	31	1.6	SW	8736	14,082	52	4 ft LED Tube	200732x1	15	0.8	NONE	8,736	6,814	7,268	0.8	$ 1,148.40	$ 7,550.40	$ 260	6.6	6.3
35LED	Hallway	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	8736	11,794	15	T 59 R LED	RTLED38	38	0.6	OCC	8,736	4,980	6,814	0.8	$ 1,076.62	$ 3,672.00	$ 770	3.4	2.7
5LED	Hallway	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	8736	2,097	4	2T XX R LED	2RTLED	25	0.1	OCC	8,736	874	1,223	0.1	$ 193.24	$ 938.25	$ 220	4.9	3.7
141LED	Auditorium	29	HPS 200	HPS200/1	250	7.3	SW	2000	14,500	29	FXLED78	FXLED78/1	78	2.3	OCC	1,800	4,072	10,428	5.0	$ 1,647.69	$ 24,609.92	$ 2,920	14.9	13.2
20LED	Auditorium	6	S 28 P F 1 (ELE)	F41ILL	31	0.2	SW	2000	372	6	4 ft LED Tube	200732x1	15	0.1	OCC	1,800	162	210	0.1	$ 33.18	$ 999.45	$ 50	30.1	28.6
20LED	Auditorium	18	S 28 P F 1 (ELE)	F41ILL	31	0.6	SW	2000	1,116	18	4 ft LED Tube	200732x1	15	0.3	OCC	1,800	486	630	0.3	$ 99.54	$ 2,741.85	$ 110	27.5	26.4
5LED	Auditorium	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	2000	480	4	2T XX R LED	2RTLED	25	0.1	OCC	1,800	180	300	0.1	$ 47.40	$ 938.25	$ 220	19.8	15.2
20LED	Hallway	8	S 28 P F 1 (ELE)	F41ILL	31	0.2	SW	8736	2,167	8	4 ft LED Tube	200732x1	15	0.1	NONE	8,736	1,048	1,118	0.1	$ 176.68	$ 1,161.60	$ 40	6.6	6.3
T5	Hallway	14	F32GL	F32GL	52	0.7	SW	8736	6,360	14	F32GL	F32GL	52	0.7	NONE	8,736	6,360	-	0.0	$ -	$ -	$ -		
234	Storage	1	R 75 C I 1	i75/1	75	0.1	SW	500	38	1	CF 26	CFQ26/1-L	27	0.0	NONE	500	14	24	0.0	$ 3.79	$ 20.25	$ -	5.3	5.3
46LED	Storage	2	W 32 P F 2 (ELE)	F42ILL	59	0.1	SW	500	59	2	4 ft LED Tube	200732x2	30	0.1	NONE	500	30	29	0.1	$ 4.58	$ 326.70	$ -	71.3	71.3
46LED	Room 118	6	W 32 P F 2 (ELE)	F42ILL	59	0.4	SW	2000	708	6	4 ft LED Tube	200732x2	30	0.2	OCC	1,600	288	420	0.2	$ 66.36	$ 1,108.35	$ 20	16.7	16.4
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	OCC	1,600	83	21	0.0	$ 3.29	$ 128.25	$ 20	39.0	32.9
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	OCC	1,600	83	21	0.0	$ 3.29	$ 128.25	$ 20	39.0	32.9
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	OCC	1,600	83	21	0.0	$ 3.29	$ 128.25	$ 20	39.0	32.9
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	OCC	1,600	83	21	0.0	$ 3.29	$ 128.25	$ 20	39.0	32.9
T5	Guidance Room	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	OCC	1,600	83	21	0.0	$ 3.29	$ 128.25	$ 20	39.0	32.9
5LED	Guidance Room	6	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.4	SW	2000	720	6	2T XX R LED	2RTLED	25	0.2	OCC	1,600	240	480	0.2	$ 75.84	$ 1,343.25	$ 320	17.7	13.5
T5	CR-114	21	F32GL	F32GL	52	1.1	SW	1250	1,365	21	F32GL	F32GL	52	1.1	OCC	1,000	1,092	273	0.0	$ 43.13	$ 128.25	$ 20	3.0	2.5
T5	Nurse	8	F32GL	F32GL	52	0.4	SW	2000	832	8	F32GL	F32GL	52	0.4	OCC	1,600	666	166	0.0	$ 26.29	$ 128.25	$ 20	4.9	4.1
T5	Room 110	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Room 108	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Toilet	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	OCC	1,600	166	42	0.0	$ 6.57	$ 128.25	$ 20	19.5	16.5
T5	Toilet	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	OCC	1,600	166	42	0.0	$ 6.57	$ 128.25	$ 20	19.5	16.5
T5	Room 106	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	CR-104	13	F32GL	F32GL	52	0.7	SW	1250	845	13	F32GL	F32GL	52	0.7	OCC	1,000	676	169	0.0	$ 26.70	$ 128.25	$ 20	4.8	4.1
5LED	CR-104	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	1250	300	4	2T XX R LED	2RTLED	25	0.1	OCC	1,000	100	200	0.1	$ 31.60	$ 938.25	$ 220	29.7	22.7
T5	CR-102	10	F32GL	F32GL	52	0.5	SW	1250	650	10	F32GL	F32GL	52	0.5	OCC	1,000	520	130	0.0	$ 20.54	$ 128.25	$ 20	6.2	5.3
T5	CR-102	7	F32GL	F32GL	52	0.4	SW	1250	455	7	F32GL	F32GL	52	0.4	OCC	1,000	364	91	0.0	$ 14.38	$ 128.25	$ 20	8.9	7.5
32LED	CR-101	18	1T 32 R F 2 (ELE)	F42LL	60	1.1	SW	1250	1,350	18	4 ft LED Tube	200732x2	30	0.5	OCC	1,000	540	810	0.5	$ 127.98	$ 4,334.85	$ 830	33.9	27.4
32LED	CR-101	2	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	1250	150	2	4 ft LED Tube	200732x2	30	0.1	OCC	1,000	60	90	0.1	$ 14.22	$ 595.65	$ 110	41.9	34.2
196LED	CR-101	3	W 32 C F 4 (ELE)	F44ILL	112	0.3	SW	1250	420	3	T 74 R LED	RTLED50	50	0.2	OCC	1,000	150	270	0.2	$ 42.66	$ 837.00	$ 20	19.6	19.2
32LED	Room 103	19	1T 32 R F 2 (ELE)	F42LL	60	1.1	SW	2000	2,280	19	4 ft LED Tube	200732x2	30	0.6	OCC	1,600	912	1,368	0.6	$ 216.14	$ 4,568.55	$ 875	21.1	17.1
32LED	Room 105	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	2000	2,520	21	4 ft LED Tube	200732x2	30	0.6	OCC	1,600	1,008	1,512	0.6	$ 238.90	$ 5,035.95	$ 965	21.1	17.0
32LED	Room 107	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	2000	2,520	21	4 ft LED Tube	200732x2	30	0.6	OCC	1,600	1,008	1,512	0.6	$ 238.90	$ 5,035.95	$ 965	21.1	17.0
46LED	Toilet	5	W 32 P F 2 (ELE)	F42ILL	59	0.3	SW	2000	590	5	4 ft LED Tube	200732x2	30	0.2	OCC	1,600	240	350	0.1	$ 55.30	$ 945.00	$ 20	17.1	16.7
32LED	Toilet	1	1T 32 R F 2 (ELE)	F42LL	60	0.1	SW	2000	120	1	4 ft LED Tube	200732x2	30	0.0	OCC	1,600	48	72	0.0	$ 11.38	$ 361.95	$ 65	31.8	26.1
32LED	Room 111	21	1T 32 R F 2 (ELE)	F42LL	60	1.3	SW	2000	2,520	21	4 ft LED Tube	200732x2	30	0.6	OCC	1,600	1,008	1,512	0.6	$ 238.90	$ 5,035.95	$ 965	21.1	17.0
T5	Office	6	F32GL	F32GL	52	0.3	SW	2000	624	6	F32GL	F32GL	52	0.3	OCC	1,600	499	125	0.0	$ 19.72	$ 128.25	$ 20	6.5	5.5
T5	Office	18	F32GL	F32GL	52	0.9	SW	2000	1,872	18	F32GL	F32GL	52	0.9	OCC	1,600	1,498	374	0.0	$ 59.16	$ 128.25	$ 20	2.2	1.8
T5	Office	4	F32GL	F32GL	52	0.2	SW	2000	416	4	F32GL	F32GL	52	0.2	OCC	1,600	333	83	0.0	$ 13.15	$ 128.25	$ 20	9.8	8.2
T5	Office	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	OCC	1,600	166	42	0.0	$ 6.57	$ 128.25	$ 20	19.5	16.5
T5	Office	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	OCC	1,600	166	42	0.0	$ 6.57	$ 128.25	$ 20	19.5	16.5
T5	Office	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	OCC	1,600	166	42	0.0	$ 6.57	$ 128.25	$ 20	19.5	16.5
T5	Office	2	F32GL	F32GL	52	0.1	SW	2000	208	2	F32GL	F32GL	52	0.1	OCC	1,600	166	42	0.0	$ 6.57	$ 128.25	$ 20	19.5	16.5
T5	Office	6	F32GL	F32GL	52	0.3	SW	2000	624	6	F32GL	F32GL	52	0.3	OCC	1,600	499	125	0.0	$ 19.72	$ 128.25	$ 20	6.5	5.5
T5	Office	1	F32GL	F32GL	52	0.1	SW	2000	104	1	F32GL	F32GL	52	0.1	OCC	1,600	83	21	0.0	$ 3.29	$ 128.25	$ 20	39.0	32.9
T5	CR-115	18	F32GL	F32GL	52	0.9	SW	1250	1,170	18	F32GL	F32GL	52	0.9	OCC	1,000	936	234	0.0	$ 36.97	$ 128.25	$ 20	3.5	2.9
T5	2nd Floor - Room 233	14	F32GL	F32GL	52	0.7	SW	2000	1,456	14	F32GL	F32GL	52	0.7	OCC	1,600	1,165	291	0.0	$ 46.01	$ 128.25	$ 20	2.8	2.4
T5	Room 231	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	OCC	1,600	998	250	0.0	$ 39.44	$ 128.25	$ 20	3.3	2.7
T5	Room 229	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	OCC	1,600	998	250	0.0	$ 39.44	$ 128.25	$ 20	3.3	2.7
T5	Room 227	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	OCC	1,600	998	250	0.0	$ 39.44	$ 128.25	$ 20	3.3	2.7
T5	Room 225	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	OCC	1,600	998	250	0.0	$ 39.44	$ 128.25	$ 20	3.3	2.7
T5	Room 223	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	OCC	1,600	998	250	0.0	$ 39.44	$ 128.25	$ 20	3.3	2.7
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2000	240	2	2T XX R LED	2RTLED	25	0.1	OCC	1,600	80	160	0.1	$ 25.28	$ 533.25	$ 120	21.1	16.3
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2000	240	2	2T XX R LED	2RTLED	25	0.1	OCC	1,600	80	160	0.1	$ 25.28	$ 533.25	$ 120	21.1	16.3
T5	Room 221	11	F32GL	F32GL	52	0.6	SW	2000	1,144	11	F32GL	F32GL	52	0.6	OCC	1,600	915	229	0.0	$ 36.15	$ 128.25	$ 20	3.5	3.0
T5	Room 221	18	F32GL	F32GL	52	0.9	SW	2000	1,872	18	F32GL	F32GL	52	0.9	OCC	1,600	1,498	374	0.0	$ 59.16	$ 128.25	$ 20	2.2	1.8
T5	Hallway	52	F32GL	F32GL	52	2.7	SW	8736	23,622	52	F32GL	F32GL	52	2.7	NONE	8,736	23,622	-	0.0	$ -	$ -	$ -		
T5	Hallway	21	F32GL	F32GL	52	1.1	SW	8736	9,540	21	F32GL	F32GL	52	1.1	NONE	8,736	9,540	-	0.0	$ -	$ -	$ -		
T5	Room 228	14	F32GL	F32GL	52	0.7	SW	2000	1,456	14	F32GL	F32GL	52	0.7	OCC	1,600	1,165	291	0.0	$ 46.01	$ 128.25	$ 20	2.8	2.4
T5	Laundry Room	6	F32GL	F32GL	52	0.3	SW	250	78	6	F32GL	F32GL	52	0.3	OCC	250	78	-	0.0	$ -	$ 128.25	$ 20		
T5	Room 226	16	F32GL	F32GL	52	0.8	SW	2000	1,664	16	F32GL	F32GL	52	0.8	OCC	1,600	1,331	333	0.0	$ 52.58	$ 128.25	$ 20	2.4	2.1
T5	Room 224	8	F32GL	F32GL	52	0.4	SW	2000	832	8	F32GL	F32GL	52	0.4	OCC	1,600	666	166	0.0	$ 26.29	$ 128.25	$ 20	4.9	4.1
T5	Room 222	16	F32GL	F32GL	52	0.8	SW	2000	1,664	16	F32GL	F32GL	52	0.8	OCC	1,600	1,331	333	0.0	$ 52.58	$ 128.25	$ 20	2.4	2.1
T5	Room 220	16	F32GL	F32GL	52	0.8	SW	2000	1,664	16	F32GL	F32GL	52	0.8	OCC	1,600	1,331	333	0.0	$ 52.58	$ 128.25	$ 20	2.4	2.1
T5	Room 218	16	F32GL	F32GL	52	0.8	SW	2000	1,664	16	F32GL	F32GL	52	0.8	OCC	1,600	1,331	333	0.0	$ 52.58	$ 128.25	$ 20	2.4	2.1
T5	Hallway	19	F32GL	F32GL	52	1.0	SW	8736	8,631	19	F32GL	F32GL	52	1.0	NONE	8,736	8,631	-	0.0	$ -	$ -	$ -		
T5	Library	20	F32GL	F32GL	52	1.0	SW	1250	1,300	20	F32GL	F32GL	52	1.0	OCC	1,000	1,040	260	0.0	$ 41.08	$ 128.25	$ 20	3.1	2.6
T5	Library	43	F32GL	F32GL	52	2.2	SW	1250	2,795	43	F32GL	F32GL	52	2.2	OCC	1,000	2,236	559	0.0	$ 88.32	$ 128.25	$ 20	1.5	1.2
72	Toilet	2	I 34	I34/1	34	0.1	SW	2000	136	2	CF 13	CFQ13/1-L	15	0.0	OCC	1,600	48	88	0.0	$ 13.90	$ 168.75	$ 20	12.1	10.7
72	Toilet	2	I 34	I34/1	34	0.1	SW	2000	136	2	CF 13	CFQ13/1-L	15	0.0	OCC	1,600	48	88	0.0	$ 13.90	$ 168.75	$ 20	12.1	10.7
T5	Room 214	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Room 212	20	F32GL	F32GL	52	1.0	SW	2000	2,080	20	F32GL	F32GL	52	1.0	OCC	1,600	1,664	416	0.0	$ 65.73	$ 128.25	$ 20	2.0	1.6
T5	Room 212	10	F32GL	F32GL	52	0.5	SW	2000	1,040	10	F32GL	F32GL	52	0.5	OCC	1,600	832	208	0.0	$ 32.86	$ 128.25	$ 20	3.9	3.3
T5	Room 210	10	F32GL	F32GL	52	0.5	SW	2000	1,040	10	F32GL	F32GL	52	0.5	OCC	1,600	832	208	0.0	$ 32.86	$ 128.25	$ 20	3.9	3.3
T5	Room 208	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Room 206	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6

Energy Audit of Ridgewood Board of Education - Ben Franklin Middle School

CHA Project No.30237

ECM-L3 Lighting Replacements with Occupancy Sensors

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Annual kWh**	**Number of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Retrofit Control**	**Annual Hours**	**Annual kWh**	**Annual kWh Saved**	**Annual kW Saved**	**Annual $ Saved**	**Retrofit Cost**	**NJ Smart Start Lighting Incentive**	**Simple Payback With Out Incentive**	**Simple Payback**
Field Code	**Unique description of the location - Room number/Room name: Floor number (if applicable)**	**No. of fixtures before the retrofit**	**Lighting Fixture Code**	**Code from Table of Standard Fixture Wattages**	**Value from Table of Standard Fixture Wattages**	**(Watts/Fixt) * (Fixt No.)**	**Pre-inst. control device**	**Estimated daily hours for the usage group**	**(kW/space) * (Annual Hours)**	**No. of fixtures after the retrofit**	**Lighting Fixture Code**	**Code from Table of Standard Fixture Wattages**	**Value from Table of Standard Fixture Wattages**	**(Watts/Fixt) * (Number of Fixtures)**	**Retrofit control device**	**Estimated annual hours for the usage group**	**(kW/space) * (Annual Hours)**	**(Original Annual kWh) - (Retrofit Annual kWh)**	**(Original Annual kW) - (Retrofit Annual kW)**	**(kWh Saved) * ($/kWh)**	**Cost for renovations to lighting system**	**Prescriptive Lighting Measures**	**Length of time for renovations cost to be recovered**	**Length of time for renovations cost to be recovered**
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2000	240	2	2T XX R LED	2RTLED	25	0.1	OCC	1,600	80	160	0.1	$ 25.28	$ 533.25	$ 120	21.1	16.3
5LED	Toilet	2	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.1	SW	2000	240	2	2T XX R LED	2RTLED	25	0.1	OCC	1,600	80	160	0.1	$ 25.28	$ 533.25	$ 120	21.1	16.3
T5	Room 204	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Room 202	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Room 201	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Room 203	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Room 205	4	F32GL	F32GL	52	0.2	SW	2000	416	4	F32GL	F32GL	52	0.2	OCC	1,600	333	83	0.0	$ 13.15	$ 128.25	$ 20	9.8	8.2
T5	Storage	2	F32GL	F32GL	52	0.1	SW	500	52	2	F32GL	F32GL	52	0.1	NONE	500	52	-	0.0	$ -	$ -	$ -		
T5	Room 207	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
T5	Office 209	12	F32GL	F32GL	52	0.6	SW	2000	1,248	12	F32GL	F32GL	52	0.6	OCC	1,600	998	250	0.0	$ 39.44	$ 128.25	$ 20	3.3	2.7
T5	Room 211	21	F32GL	F32GL	52	1.1	SW	2000	2,184	21	F32GL	F32GL	52	1.1	OCC	1,600	1,747	437	0.0	$ 69.01	$ 128.25	$ 20	1.9	1.6
72	Storage	3	I 34	I34/1	34	0.1	SW	500	51	3	CF 13	CFQ13/1-L	15	0.0	NONE	500	23	29	0.1	$ 4.50	$ 60.75	$ -	13.5	13.5
T5	Room 213	5	F32GL	F32GL	52	0.3	SW	2000	520	5	F32GL	F32GL	52	0.3	OCC	1,600	416	104	0.0	$ 16.43	$ 128.25	$ 20	7.8	6.6
T5	Room 213	14	F32GL	F32GL	52	0.7	SW	2000	1,456	14	F32GL	F32GL	52	0.7	OCC	1,600	1,165	291	0.0	$ 46.01	$ 128.25	$ 20	2.8	2.4
46LED	TV Room	15	W 32 P F 2 (ELE)	F42ILL	59	0.9	SW	1500	1,328	15	4 ft LED Tube	200732x2	30	0.5	OCC	1,200	540	788	0.4	$ 124.43	$ 2,578.50	$ 20	20.7	20.6
32LED	Hallway	24	1T 32 R F 2 (ELE)	F42LL	60	1.4	SW	8736	12,580	24	4 ft LED Tube	200732x2	30	0.7	NONE	8,736	6,290	6,290	0.7	$ 993.81	$ 5,608.80	$ 1,080	5.6	4.6
32LED	Hallway	46	1T 32 R F 2 (ELE)	F42LL	60	2.8	SW	8736	24,111	46	4 ft LED Tube	200732x2	30	1.4	NONE	8,736	12,056	12,056	1.4	$ 1,904.80	$ 10,750.20	$ 2,070	5.6	4.6
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S	**Total**	**1,726**				**105.3**			**289,149**	**1,726**				**70.7**			**176,209**		**34.6**	**17,845**	**213,103**	**$24,310**		
S																	**Demand Savings**			**34.6**	**$0**			
S																	**kWh Savings**			**112,940**	**$17,845**			

Ridgewood Board Of Education
CHA Project Number: 30237

Rate of Discount (used for NPV) 3.0%

Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
$ 0.158	$/kWh blended		0.000420205	190,400	Electric	Natural Gas	Fuel Oil
$ 0.158	$/kWh supply	540,125	0.000420205		$ 85,118	$ 56,950	
$ -	$/kW	253.0	0				
$ 0.82	$/Therm	69,714	0.00533471				
$ 5.00	$/kgals	1,915	0				
water	$/Gal						

Ben Franklin Middle School

Recommend? Y or N		Item	Savings kW	kWh	therms	No. 2 Oil gal	Water kgal	$	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 kW	kWh	therms	kgal/yr	$	ROI	NPV	IRR
N	ECM-1A	Convert the Steam System to Hot Water System	0.0	0	15,492	0	0	12,657	$ 4,089,763	323.1	30	82.6	$ 7,000	N	322.6	0.0	0	464,760	0	$ 379,709	(0.9)	($3,834,681)	-11.4%
Y	ECM-1B	Boiler Replacement	0.0	0	6,885	0	0	5,625	$ 223,300	39.7	30	36.7	$ 7,000	N	38.5	0.0	0	206,560	0	$ 168,760	(0.2)	($106,042)	-1.5%
Y	ECM-2	Replace Motors in HV Units	0.8	4,133	0	0	0	653	$ 7,190	11.0	25	1.7	$ -	N	11.0	20.6	103,336	0	0	$ 16,327	1.3	$4,182	7.6%
N	ECM-3	Replace Pneumatic Control Devices with DDC Devices	0.0	9,442	637	0	0	2,012	$ 494,944	246.0	20	7.4	$ -	N	246.0	0.0	188,839	12,743	0	$ 40,247	(0.9)	($465,005)	-17.2%
Y	ECM-4	Install Window AC Controllers	0.0	15,741	0	0	0	2,487	$ 8,300	3.3	15	6.6	$ -	N	3.3	0.0	236,119	0	0	$ 37,307	3.5	$21,391	29.3%
Y	ECM-5	Install Kitchen Hood Controls	0.0	1,344	1,644	0	0	1,555	$ 32,747	21.1	15	9.3	$ -	N	21.1	0.0	20,162	24,654	0	$ 23,328	(0.3)	($14,182)	-4.0%
Y	ECM-6	Walk-in Cooler & Freezer EC Motor Retrofits	0.0	6,225	0	0	0	984	$ 22,275	22.6	20	2.6	$ -	N	22.6	0.0	124,505	0	0	$ 19,672	(0.1)	($7,642)	-1.2%
N	ECM-L1	Lighting Replacements / Upgrades	34.6	93,728	0	0	0	14,809	$ 198,098	13.4	15	39.4	$ 21,970	N	11.9	518.4	1,405,920	0	0	$ 222,135	0.1	$661	3.1%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	25,909	0	0	0	4,094	$ 15,005	3.7	15	10.9	$ 2,340	N	3.1	0.0	388,635	0	0	$ 61,404	3.1	$36,204	31.8%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	34.6	112,940	0	0	0	17,845	$ 213,103	11.9	15	47.5	$ 24,310	N	10.6	518.4	1,694,100	0	0	$ 267,668	0.3	$24,234	4.7%
		Total (Does Not Include ECM-L1 & ECM-L2)	**35.4**	**149,826**	**24,658**	**0**	**0**	**$ 43,818**	**$ 5,091,623**	**116.2**	**21.3**	**195**	**$ 38,310**		**115.3**	**539**	**2,367,060**	**708,717**	**-**	**$ 953,017**	**(0.8)**	**(4,377,745)**	**-12.1%**
		Recommended Measures (highlighted green above)	**35.4**	**140,384**	**8,529**	**0**	**0**	**$ 29,149**	**$ 506,916**	**17.4**	**20.0**	**104**	**$ 31,310**	**0**	**16.3**	**539**	**2,178,221**	**231,214**	**-**	**$ 533,061**	**0.1**	**(78,058)**	**2.0%**
		% of Existing	**14%**	**26%**	**12%**	**0**	**0**																

	City:	Newark, NJ					
	Occupied Hours/Week	50					
		Building	Auditorium	Gymnasium	Library	Classrooms	
	Enthalpy	Operating	Occupied	Occupied	Occupied	Occupied	
Temp	h (Btu/lb)	Bin Hours	Hours	Hours	Hours	Hours	Hours
102.5							
97.5	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	75%
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

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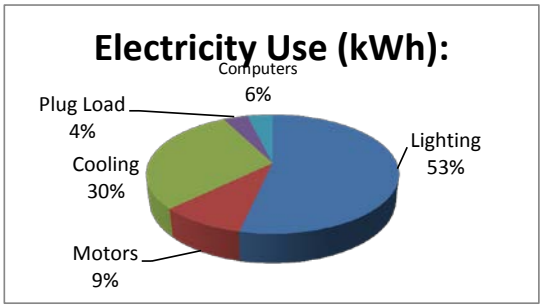
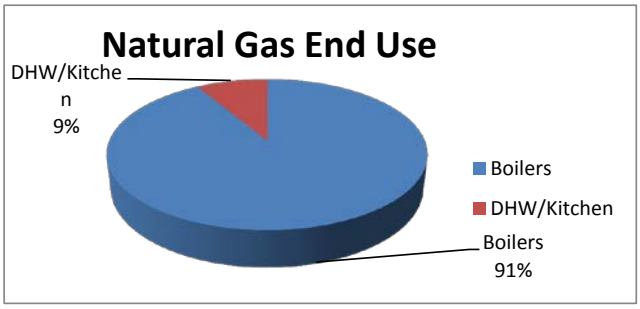
Utility End Use Analysis			
Electricity Use (kWh):		**Notes/Comments:**	
540,125	Total	Based on utility analysis	
289,149	Lighting	From Lighting Calculations	54%
50,000	Motors	Estimated	9%
160,000	Cooling	Calculated from Cooling Capacity	30%
20,000	Plug Load	Estimated	4%
20,976	Computers	Estimated	4%
-		Remaining	0%
Natural Gas Use (Therms):		**Notes/Comments:**	
69,714	Total	Based on utility analysis	
63,714	Boilers	Therms/SF x Square Feet Served	91%
6,000	DHW/Kitchen	Based on utility analysis	9%





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Ben Franklin Middle School

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

Description: This school facility is interested in converting the steam system to hot water system regardless of the high initial cost. Therefore, this measure is a priliminary analysis of energy savings of converting to hot water.A throughout system design analysis is required in order to accurately quantify the savings and first cost.

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 0.82	/ 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	7,436,703	btu/hr	Estimated Boiler Load % and Capacity
Heating Combustion Efficiency	75%		Estimated averaged Efficiency
Heating Degree-Day	2,783	Degree-day	
Design Temperature Difference	57	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	7,436,703	btu/hr	
Efficiency	90%		
SAVINGS			
Fuel Savings	15,492	therms	NJ Protocols Calculation
Fuel Cost Savings	$ 12,657		

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.spaceray.com/1_space-ray_faqs.php

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

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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	95,200	SF	$ 14	$ 14		$ 1,368,786	$ 1,660,669	$ -	$ 3,029,454	Estimated based on prior experience
						$ -	$ -	$ -	$ -	

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

$ 3,029,454	Subtotal
$ 1,060,309	35% Contingency
$ 4,089,763	**Total**

Ridgewood Board Of Education
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Ben Franklin Middle School

ECM-1B Boiler Replacement

Description: This measure looks at replacing one boiler in kind and use the new boiler as the main boiler

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 0.82	/ 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	7,436,703	btu/hr	Estimated Boiler Load % and Capacity
Heating Combustion Efficiency	75%		Estimated averaged Efficiency
Heating Degree-Day	2,783	Degree-day	
Design Temperature Difference	57	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	7,436,703	btu/hr	
Efficiency	81%		
SAVINGS			
Fuel Savings	6,885	therms	NJ Protocols Calculation
Fuel Cost Savings	$ 5,625		

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.spaceray.com/1_space-ray_faqs.php

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

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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.		
Steam Boiler	1	EA	$ 88,500	$ 16,700		$ 90,890	$ 20,808	$ -	$ 111,698	RS Means
Flue Installation	1	LS	$5,000.0	$5,000.00		$ 5,135	$ 6,230	$ -	$ 11,365	Estimated
Miscellaneous Electrical	1	LS	$ 5,000	$ 2,500		$ 5,135	$ 3,115	$ -	$ 8,250	Estimated
Miscellaneous GC work	1	EA	$ 15,000	$ 15,000		$ 15,405	$ 18,690	$ -	$ 34,095	Estimated
Crane	1	EA				$ -	$ -	$ -	$ -	Estimated
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

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

$	165,408	Subtotal
$	57,893	35% Contingency
$	**223,300**	**Total**

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Ben Franklin Middle School

ECM-2 Replace Motors in HV Units

Description: This ECM evaluates the energy (electrical) savings associated with replacing existing motors with high efficiency motors (based on ASHRAE 2010 NEMA ratings) in the old Heating Ventilating (HV) Units

Variable Inputs

Electric Rate	$0.158	$/kWh
Demand Rate		$/kW

MOTOR SCHEDULE										Savings Factor		Existing Motor Energy		Proposed Motor Energy		Energy Savings	
Motor ID	Motor Type	Qty	HP	Total HP	Upgrade Motor	Load Factor	Existing Motor Eff.	New Motor Eff.	Annual Hours	Demand Savings Factor	Energy Savings Factor	Demand (kW)	Energy (kWh)	Demand (kW)	Energy (kWh)	Peak Demand Savings (kW)	Annual Energy Savings (kWh)
HV-1	Forward Curved Fan	1	3.0	3.0	Y	0.80	86.0%	89.5%	5,027	0.216	0.240	2.1	10,464	2.0	10,055	0.1	409
HV-2	Forward Curved Fan	1	7.5	7.5	Y	0.80	88.5%	91.0%	5,027	0.216	0.240	5.1	25,421	4.9	24,723	0.1	698
HV-3	Forward Curved Fan	1	2.0	2.0	Y	0.80	84.0%	86.5%	5,027	0.216	0.240	1.4	7,142	1.4	6,936	0.0	206
HV-4	Forward Curved Fan	1	3.0	3.0	Y	0.80	86.0%	89.5%	5,027	0.216	0.240	2.1	10,464	2.0	10,055	0.1	409
HV-5	Forward Curved Fan	1	2.0	2.0	Y	0.80	84.0%	86.5%	5,027	0.216	0.240	1.4	7,142	1.4	6,936	0.0	206
HV-6	Forward Curved Fan	1	3.0	3.0	Y	0.80	86.0%	89.5%	5,027	0.216	0.240	2.1	10,464	2.0	10,055	0.1	409
HV-7	Forward Curved Fan	1	2.0	2.0	Y	0.80	84.0%	86.5%	5,027	0.216	0.240	1.4	7,142	1.4	6,936	0.0	206
HV-8	Forward Curved Fan	1	5.0	5.0	Y	0.80	87.5%	89.5%	5,027	0.216	0.240	3.4	17,141	3.3	16,758	0.1	383
HV-9	Forward Curved Fan	1	2.0	3.0	Y	0.80	86.0%	89.5%	5,027	0.216	0.240	2.1	10,464	2.0	10,055	0.1	409
HV-10	Forward Curved Fan	1	2.0	2.0	Y	0.80	84.0%	86.5%	5,027	0.216	0.240	1.4	7,142	1.4	6,936	0.0	206
HV-11	Forward Curved Fan	1	5.0	5.0	Y	0.80	87.5%	89.5%	5,027	0.216	0.240	3.4	17,141	3.3	16,758	0.1	383
HV-12	Forward Curved Fan	1	2.0	2.0	Y	0.80	84.0%	86.5%	5,027	0.216	0.240	1.4	7,142	1.4	6,936	0.0	206
															Total:	0.8	4,133.4
																$ -	$ 653
																	$ 653

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ECM-2 Replace Motors in HV Units - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
2HP Motor	6	ea	$ 295	$ 79		$ 1,818	$ 591	$ -	$ 2,408	RS Means 2012
3HP Motor	3	ea	$ 326	$ 79		$ 1,004	$ 295	$ -	$ 1,300	RS Means 2012
5HP Motor	2	ea	$ 373	$ 79		$ 766	$ 197	$ -	$ 963	RS Means 2012
7.5HP Motor	1	ea	$ 536	$ 84		$ 550	$ 105	$ -	$ 655	RS Means 2013
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

$ 5,326	Subtotal
$ 1,864	35% Contingency
$ 7,190	**Total**

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

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ECM-3 Replace Pneumatic Control Devices with DDC Devices

Description: This ECM evaluates the energy savings associated with replacing the existing pneumatic controls including the air compressor with digital control devices. This calulation only includes the savings associated with the air compressor as the current controls system ,although antiquated, is being remotely controlled by Energy for America. Thier control strategy includes turning off all HVAC systems during unoccupied times and limiting temperatures during occupied time , hence there are much fewer opportunities for controls related energy savings.

Building Information:

190,400	Sq Footage	$0.158	$/kWh Blended
Y	Cooling	$0.82	$/Therm
Y	Heating		

Hybrid to Full DDC Savings

EXISTING CONDITIONS			
Existing Facility Total Electric usage		540,125	kWh
Existing Facility Total Gas usage		69,714	Therms
Existing Facility Cooling Electric usage		160,000.0	kWh[1]
Existing Facility Heating Natural		63,714	Therms[2]
PROPOSED SAVINGS			
Proposed Facility Cooling Electric Savings		1,600	kWh
Proposed Facility Natural Gas Savings		637	Therms
Air Compressor Electric Savings		7,842	kWh
SAVINGS			
Electric Savings		9,442	**kWh**
Natural Gas Savings		637	**Therms**

Air Compressor

Motor Capacity	Load	Run Hours	Electric Usage
HP	%	hr/yr	kWh/yr
3	80%	4,380	7,842

Assumptions

1	30%	of facility total electricity dedicated to Cooling; based on utility information
2	91%	of facility total natural gas dedicated to Heating; based on utility information
3	1%	Estimated savings of eliminating the air leaks
4	$ 4,380	Annual air compresser run hours

COMBINED SAVINGS		
Natural Gas Savings	637	Therms
Cooling Electricity Savings	9,442	kWh
Total Cost Savings	$ 2,012	
Estimated Total Project Cost	$ 494,944	
Simple Payback	246.0	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

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Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-3 Replace Pneumatic Control Devices with DDC Devices - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Replace pneumatic with DDC controls	1	LS	$175,000	$150,000		$ 179,725	$ 186,900	$ -	$ 366,625	Estimated@ $2/ SF
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

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

$	366,625	Subtotal
$	128,319	35% Contingency
$	**494,944**	**Total**

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Ben Franklin Middle School

EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (btu/h)	
Window AC	Classrooms	400,000	40 units

Total btu/h of all window A/C Units: *400,000* *btu/h*

ECM-4 Install Window AC Controllers

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	$0.158	/ 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	400,000	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	10.0		
Existing Annual Electric Usage	33,405	kWh	

Item	Value	Units	Comments
Proposed Annual Electric Usage	17,663	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Electrical Usage Savings	15,741	kWh
Annual Cost Savings	$2,487	
Total Project Cost	$8,300	
Simple Payback	3	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
Ben Franklin Middle School

ECM-4 Install Window AC Controllers - 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.		
						0	$ -	$ -	$ -	
Window AC Controller	40	EA	$ 150	$ -	$ -	6162	$ -	$ -	$ 6,162	Estimated
						$ -	$ -	$ -	$ -	

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

$	6,162	Subtotal
$	2,157	35% Contingency
$	**8,300**	**Total**

Ridgewood Board Of Education
CHA Project Number: 30237
Ben Franklin Middle School

ECM-5 Install Kitchen Hood Controls

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

Item	Value	Units	Formula/Comments	
Fuel Cost	$ 0.82	/ Therm		
Electricity Cost	$ 0.16	/kWh		
		FORMULA CONSTANTS		
Conversion	0.746	HP/kW		
Constant	24	hrs/day		
Constant	1.08	(btu/hr)/CFM·F		
Conversion	3,412	btu/kWh		
		ELECTRIC FAN SAVINGS		
Facility Type	School			
Quantity of Kitchen Hood Fan Motors	1			Q
Kitchen Hood Fan Motor HP	1.0	HP	Estimated	HP
Motor Load Factor	0.90		NJ Protocols	LF
Efficiency of Fan Motor(s)	87.5%			FEFF
Kitchen Hood Fan Run Hours	2,080			RH
Fan Motor Power Reduction (From VFD)	0.584			PR
Fan Electricity Savings	932	kWh		
		HEATING SAVINGS		
Kitchen is Heated?	Y			
Square Footage of Kitchen	600	ft^2	Estimated	SF
Code Required Ventilation Rate	0.70	CFM/ft^2	NJ Protocols	CFM/SF
Ventilation Oversize Factor	1.40		NJ Protocols	OF
Flow Reductuion (from VFD/Control)	0.310			FR
Heating Degree Day	2,783		NJ Protocols Table	HDD
Heating System Efficiency	80%		AFUE (%)	HEFF
Heating Savings	164	MMbtu		
Heating Savings	1,644	Therms		
		COOLING SAVINGS		
Kitchen is Cooled?	Y			
Cooling Degree Day	893		NJ Protocols Table	CDD
Cooling System Efficiency	3.00		COP	CEFF
Cooling Savings	412	kWh		
		TOTAL SAVINGS		
Electricity Savings	1,344	kWh		
Fuel Savings	1,644	Therms		
Cost Savings	$ 1,555			

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

Ridgewood Board Of Education
CHA Project Number: 30237
Ben Franklin Middle School

ECM-5 Install Kitchen Hood Controls - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
MeLink Kitchen Hood Control System	1	ea	$ 15,000	$ 5,000		$ 15,405	$ 6,230	$ -	$ 21,635	Vendor Est
						$ -	$ -	$ -	$ -	RS Means 2012
1.0 HP Motor	1	ea	$ 245	$ 79		$ 251	$ 98	$ -	$ 349	RS Means 2012
						$ -	$ -	$ -	$ -	RS Means 2012
Electrical - misc.	1	ls	$ 1,000	$ 1,000		$ 1,027	$ 1,246	$ -	$ 2,273	RS Means 2012
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

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

$ 24,257	Subtotal
$ 8,490	35% Contingency
$ 32,747	**Total**

Ridgewood Board Of Education
CHA Project Number: 30237
Ben Franklin Middle School

ECM-6 Walk-in Cooler & Freezer EC Motor Retrofits

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

Utility Cost

$0.16 $/kWh Blended

EXISTING CONDITIONS			
Walk-In Freezer(s)			
Existing Freezer Controls?	N		
Quantity of Walk-In Freezers	1		
Nameplate Amps of Freezer Evaporator Fan	3.3		AmpsEF
Nameplate Volts of Freezer Evaporator Fan	208		VoltsEF
Phase of Evaporator Fan	1		PhaseEF
Power Factor of Evaporator Fan	0.55		PFEF
Operating Hours	8,760	hrs	
Load Reduction	65%		LR
Electricity Savings (Evaporator Fan)	2,150	kWh	kWhEF
Electricity Savings (Evaporator Fan Reduced Heat)	963	kWh	kWhRH
Total Walk-In Freezer(s) Electricity Savings	3,113	kWh	
Walk-In Cooler(s)			
Existing Cooler Controls?	N		
Quantity of Walk-In Coolers	1		
Nameplate Amps of Cooler Evaporator Fan	3.3		
Nameplate Volts of Cooler Evaporator Fan	208		
Phase of Evaporator Fan	1		
Power Factor of Evaporator Fan	0.55		
Operating Hours	8,760	hrs	
Load Reduction	65%		
Electricity Savings (Evaporator Fan)	2,150	kWh	
Electricity Savings (Evaporator Fan Reduced Heat)	963	kWh	
Total Walk-In Cooler(s) Electricity Savings	3,113	kWh	
SAVINGS			
Total Electricity Savings	**6,225**	**kWh**	
Total Cost Savings	**$ 984**		
Estimated Cost	$ 22,275		
Simple Payback	22.6	**years**	

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

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

Ridgewood Board Of Education
CHA Project Number: 30237
Ben Franklin Middle School

ECM-6 Walk-in Cooler & Freezer EC Motor Retrofits - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

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

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

$ 16,500	Subtotal
$ 5,775	35% Contingency
$ 22,275	**Total**

Ridgewood Board Of Education
CHA Project Number: 30237
Ben Franklin Middle School

New Jersey Pay For Performance Incentive Program

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

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

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

Total Building Area (Square Feet)	190,400
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilites (BPU)

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

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$85,118	$56,950
Existing Usage (from utility)	540,125	69,714
Proposed Savings	140,384	8,529
Existing Total MMBtus	8,815	
Proposed Savings MMBtus	1,332	
% Energy Reduction	**15.1%**	
Proposed Annual Savings	$29,149	

	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	$0.09	$0.91
Incentive #3	$0.09	$0.90	$0.005	$0.05	$0.11	$1.25	$0.09	$0.91

	Incentives $		
	Elec	Gas	Total
Incentive #1	$0	$0	$9,520
Incentive #2	$12,713	$7,723	$20,436
Incentive #3	$12,713	$7,723	$20,436
Total All Incentives	**$25,425**	**$15,447**	**$50,392**

Total Project Cost	$506,916

		Allowable Incentive
% Incentives #1 of Utility Cost*	6.7%	$9,520
% Incentives #2 of Project Cost**	4.0%	$20,436
% Incentives #3 of Project Cost**	4.0%	$20,436
Total Eligible Incentives***	**$50,392**	
Project Cost w/ Incentives	$456,524	

Project Payback (years)	
w/o Incentives	w/ Incentives
17.4	15.7

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

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

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

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

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

APPENDIX D

New Jersey Board of Public Utilities Incentives

i. **Smart Start**

ii. **Direct Install**

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

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

I. SMART START

NJ SmartStart Buildings

Program Overview

With New Jersey SmartStart Buildings ...

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

Special Notice

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

Visit the Sandy web page for details and important links.

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

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

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

Getting Started

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

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

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

Support for Custom Energy-Efficiency Measures

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

Incentives for Qualifying Equipment and Projects

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

Find out more about equipment incentives

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

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COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

EQUIPMENT INCENTIVES

FOOD SERVICE EQUIPMENT

APPLICATION FORMS

TOOLS AND RESOURCES

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

Home » Commercial & Industrial » Programs » NJ SmartStart Buildings

Equipment Incentives

Special Notice

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

Visit the Sandy web page for details and important links.

More reasons for a smart start on your next project!

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

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

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

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

Electric Chillers

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

Gas Cooling

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

PAST PROGRAMS

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 Measur
Gas furnaces ($300-$400 per unit)
Gas infrared heaters - indoor only ($300 - $500 per unit)
Boiler economizing controls ($1,200 - $2,700 per unit)

Variable Frequency Drives

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

Natural Gas Water Heating

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

Premium Motors

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

Refrigerator/Freezer Case Premium Efficiency Motors (ECM)

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

Prescriptive Lighting

New Linear Fluorescent

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

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

Lighting Controls

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

Refrigeration

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

Food Service Equipment

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

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

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

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

Other Equipment Incentives*

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

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

II. DIRECT INSTALL

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

PARTICIPATION STEPS

PARTICIPATING CONTRACTORS

SUSTAINABLE JERSEY

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

Direct Install

NEW JERSEY'S CLEAN ENERGY PROGRAM
DIRECT Install

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

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

ELIGIBILITY

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

SYSTEMS & EQUIPMENT ADDRESSED BY THE PROGRAM

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

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

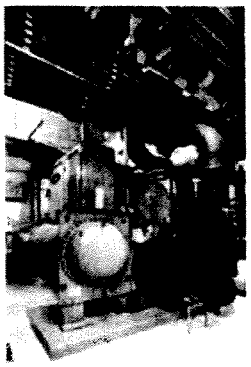
III. PAY FOR PERFORMANCE (P4P)

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

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



Eligibility

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

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

ENERGY STAR Portfolio Manager

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

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

Incentives

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

PAST PROGRAMS

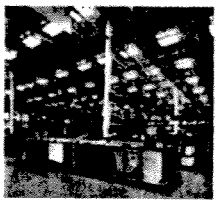
TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

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

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



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

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

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

Steps to Participation

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

Home | Residential | Commercial & Industrial | Renewable Energy
About Us | Press Room | Library | FAQs | Calendar | Newsletters | Contact Us | Site

New Jersey's cleanenergy program™ njcleanenergy.com

NEW JERSEY'S CLEAN ENERGY PROGRAM P4P PAY FOR PERFORMANCE

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	Zip
Phone/Fax	E-mail	Federal ID/SSN	NAICS Code

Partner Information

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

Project Information

Project Name			
Building Address	City	State	Zip
Utility Account Number(s): Electric		Gas	
* Note: Please use the back of this page for additional utility accounts if quantity exceeds space allotment.			
Annual Peak kW Demand	Building Type	Number of Buildings	
Size of Building(s) (gross sq/ft)	Direct, Master or Sub Metered		

Funding

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

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

Utility Program – Utility:_____ Program Name: _____

Federal Program – Organization: _____ Program Name: _____

Other Program – Organization: _____ Program Name: _____

Additional Project information

Additional Utility Account(s)

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

Additional Comments:

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

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

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

Visit our website: NJCleanEnergy.com/P4P

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

ADMINISTRATOR – New Jersey Board of Public Utilities (NJBPU)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CUSTOMER'S SIGNATURE

PARTNER SIGNATURE

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

IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

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

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

Local Government
School Districts (K-12)

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

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings
Procedures for Implementation

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

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

FIRST STEP – ENERGY AUDIT

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

ENERGY REDUCTION PLANS

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

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

ESIP PROGRAM

Final version 42413

BPU RULES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

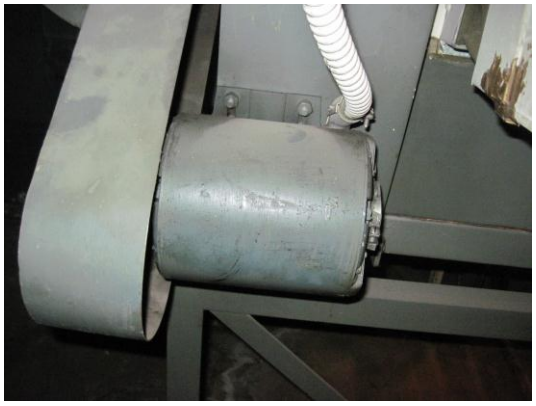
20. Energy Savings Plans (ESP) that is dependent upon incentives from the Clean Energy Program must review the current program requirements, at the time of application, for each incentive to insure eligibility. If any program incentive is denied, resubmission of all ESIP related forms will be necessary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

APPENDIX E

Photovoltaic Analysis

APPENDIX F

Photos



Existing HV Fan Motor

Existing Walk-in Cooler/Freezer

Existing Window ACs

Existing Lights

Existing Kitchen Hood

APPENDIX G

EPA Benchmarking Report

ENERGY STAR® Statement of Energy Performance

93

ENERGY STAR® Score[1]

Ben Franklin Middle School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 190,400
Built: 1949

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
Ben Franklin Middle School
335 N Van Dien Ave
Ridgewood, New Jersey 07450

Property ID: 4461791

Property Owner
_____
,
(____)____-_____

Primary Contact
____ _____
,
(____)____-_____
_____

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
46.3 kBtu/ft²

Source EUI
68.8 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	1,842,906 (21%)
Natural Gas (kBtu)	6,971,435 (79%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	81.3
National Median Source EUI (kBtu/ft²)	120.8
% Diff from National Median Source EUI	-43%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	617

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)