THE NEWARK PUBLIC SCHOOLS

Group 3 Buildings

SOUTH STREET SCHOOL

151 South Street, Newark, NJ 07114

LOCAL GOVERNMENT ENERGY AUDIT PROGRAM

FOR

NEW JERSEY
BOARD OF PUBLIC UTILITIES

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CHA PROJECT NO. 27999

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

Building Name	Address	Square Feet	Construction Date
South Street School	151 South St., Newark NJ 07114	29,510	1883

The 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)
South Street School	35,973	3,242	8,529	7.6

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

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

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

Summary of Energy Conservation Measures

ECM #	Energy Conservation Measure	Est. Costs ($)	Est. Savings ($/year)	Payback w/o Incentive	Potential Incentive ($)*	Payback w/ Incentive	Recommended
1	Install Door Sweeps and Seals	2,074	463	4.5	0	4.5	Y
2	Convert Building from Steam to HW and Install High Efficiency Boilers	960,908	10,301	93.3	3,000	93.0	N
3	Install Window A/C Controllers	600	393	1.5	0	1.5	Y
4A	Install Basic Controls	21,309	2,715	7.8	0	7.8	Y
4B**	Install Full DDC Controls	250,000	4,274	58.5	0	58.5	N
5	Upgrade Plumbing Fixtures	52,906	292	181.2	0	181.2	N
L1**	Lighting Replacements / Upgrades	32,608	4,339	7.5	400	7.4	N
L2**	Install Lighting Controls (Occupancy Sensors)	8,586	1,292	6.6	1,105	5.8	N
L3	Lighting Replacements with Controls	40,924	4,959	8.3	1,505	7.9	Y
	Total**	**1,078,722**	**19,122**	**56.4**	**4,505**	**56.2**	
	Total (Recommended)	**64,908**	**8,529**	**7.6**	**1,505**	**7.4**	

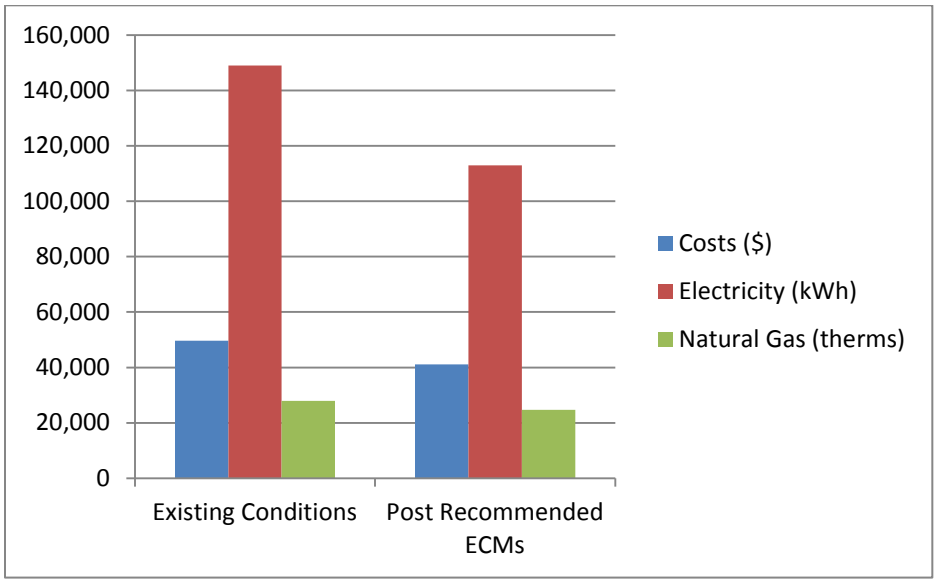
* Incentive shown is per the New Jersey SmartStart Program.
** These ECMs are not included in the Total, as they are alternate measures not recommended.

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

- Photovoltaic (PV) Rooftop Solar Power Generation – 10 kW System

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	49,660	41,131	17%
Electricity (kWh)	148,920	112,947	24%
Natural Gas (therms)	27,911	24,669	12%
Site EUI (kbtu/SF/Yr)	111.8	96.7	



2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

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

Building Name: South Street School (Index No. 70)
Address: 151 South Street, Newark, NJ 07114
Gross Floor Area: 74,849 Square Feet
Number of Floors: 4
Year Built: 1883
Additions: 1900

Description of Spaces: Classrooms, offices, cafeteria, kitchen, multi-purpose room, computer lab, storage rooms, toilet rooms and a mechanical room.
Description of Occupancy: The school serves 343 students from Pre-K to 5th grade. There are 30 school faculty and staff members.
Number of Computers: The school has approximately 45 desktop and laptop computers.
Building Usage: Hours of operation are 8:15 AM – 3:00 PM Monday through Friday, with various after-school activities until 6:00 PM. Custodians are in the building until 11:00 each night. In general the occupied hours are considered 80 hours per week, 10 months per year
Construction Materials: The building is constructed of brick with both steel or wood framing and no insulation. The interior walls are a mixture of brick and plaster.
Façade: Brick
Roof: The roof is pitched with new asphalt shingles. The attic was not accessible during the facility visit but based on the age of the building the framing is likely wood.
Windows: The windows throughout the building are double hung single pane aluminum framed windows. Windows are in good condition and no ECMs associated with window replacement were evaluated.

Exterior Doors: Exterior doors throughout the school are metal with single pane safety glass. Sweeps on exterior doors were in poor condition and can be replaced.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: The heating system consists of two (2) Burnham EL-80; 80 HP, 2,678 MBH, natural gas fired steam boilers. During the facility visit one boiler was under maintenance, but according to facility staff, only one boiler is needed to handle the building load. The steam pressure is generally maintained between 1-3 psi, but can reach as high as 5 psi. Classrooms, offices, the cafeteria and gymnasium have steam radiators. The cafeteria also has two (2) older unit ventilators (UV) with steam coils. The stairwells are heated by unit heaters (UH) with steam coils. In general a steam heating system is less efficient and consumes more energy than that of a hot water heating system. There are two opportunities that exist to reduce energy consumption for the existing steam system: 1) install controls to allow for automatic control of the system including steam pressure reset or 2) replace the entire steam heating system with hot water which would include new supply and return piping and equipment.

Cooling: The only cooling in this school is from three (3) window air conditioning units. Since there is no automated control, occasionally window ACs may be left on while the building is un-occupied. The main office, nurse's office and cafeteria have small split system ducted air conditioning units, which facility personnel indicated as not functioning. The condensing units for the split systems are located on the exterior of the building and appeared to be about 2 tons each.

Ventilation: There are four (4) classrooms with newer McQuay UVs which would provide a small amount of ventilation; however the outdoor air (OA) dampers appeared to be closed during the facility visit. The cafeteria also had two (2) UVs which were older and appeared to also have closed OA dampers during the facility visit.

The main offices, Nurse's office and cafeteria used to also receive OA from the small ducted A/C systems which served those areas respectively; however the custodian on staff indicated that they are not functioning.

The remainder of the ventilation in the school occurs through the opening of windows around the school. Classrooms used to be ventilated through gravity ventilators however they do not appear to be operable at this time.

Exhaust: There are no exhaust fans in this school. It is possible that restrooms and general spaces are exhausted through the use of small gravity vents, but there was no roof/attic access during the facility visit to confirm.

Controls Systems

The steam radiators in the classrooms have no control valves whatsoever. The cafeteria and gymnasium have steam radiators at the ceiling level which are controlled with manual valves and have bear traps. Heat in the building is regulated by teachers opening and closing windows throughout the day. The boilers are typically turned on in October and off in April. UVs in rooms which have them are manually controlled on each unit. In general there are no thermostats in this school and therefore no set points. If controls were present in the building,

the school would benefit from a reduction in energy consumption associated with heating the building.

Domestic Hot Water Systems

Domestic hot water (DHW) is generated by a 70 gallon, State Sand Blaster SBF70360NEASME natural gas fired water heater with an input capacity of 360,000 btu/h and recovery rate of 340.3 gal/h. DHW is used in toilet rooms throughout the school and in kitchen scullery sinks.

Kitchen Equipment

The kitchen at South Street School is only used to reheat food (cooking is performed elsewhere). Kitchen equipment includes two (2) double door reach-in refrigerators, one (1) double door freezer and one gas fired double oven. The reach-in refrigerators and freezers are in good condition. There is no dishwasher or kitchen hood in the school.

Plumbing Systems

There is one boy's and one girl's restroom located on the 1st floor of this school with two single stall restrooms for faculty. The second and third floors only contain two single stall restrooms each either located in a classroom or a faculty lounge. The plumbing fixtures (i.e., toilets and urinals) appear to be high flow and lavatory faucets have metering-type faucets. Older ceramic drinking fountains are present in corridors on the first floor.

Plug Load

This school has computers, copiers, smart boards, residential appliances (microwave, refrigerator), printers and portable electric heaters (personal) which contribute to the plug load in the building.

Lighting Systems

The lighting system consists of 4', 2-lamp or 1-lamp pendant mounted 32W T8 fluorescent fixtures with prismatic wraparound lenses. There are also a handful of 2' 2-lamp 32W T8 fluorescent fixtures in use in custodial closets, storage rooms and rest rooms. There are no high bay areas in this school and therefore no HID-type fixtures. All interior lighting is manually controlled by wall switches

Exterior lighting includes two (2) 1000W wall mounted area light fixtures, one of which was on during the facility visit. It is likely the exterior lighting is controlled by photocell mounted on the light fixture.

3.0 UTILITIES

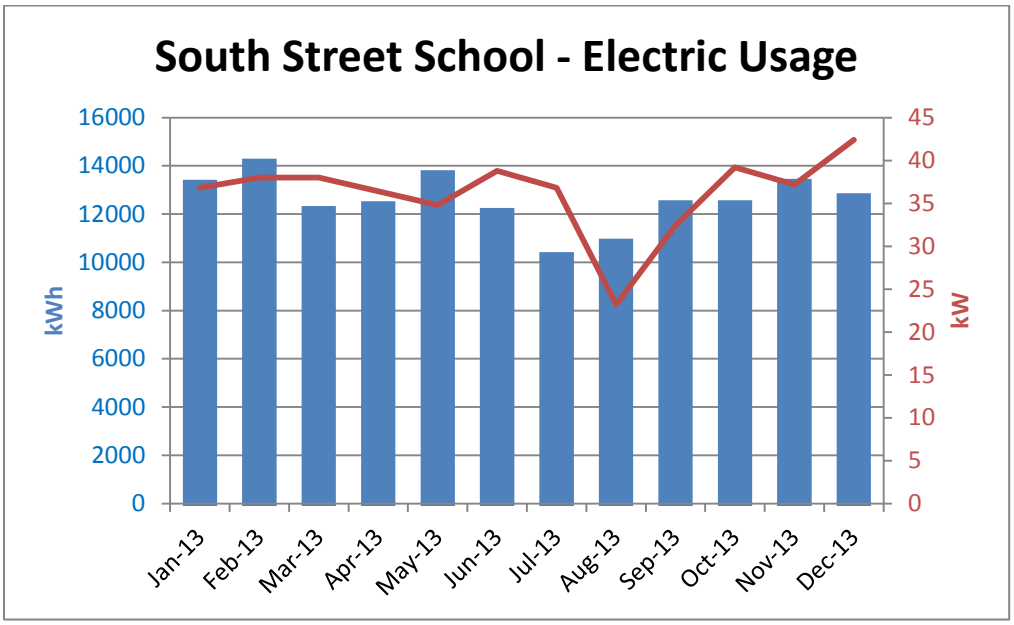
Utilities used by the building are delivered and supplied by the following utility companies:

	Electric	Natural Gas
Deliverer	PSEG	PSEG
Supplier	Nextera Energy Services	PSEG

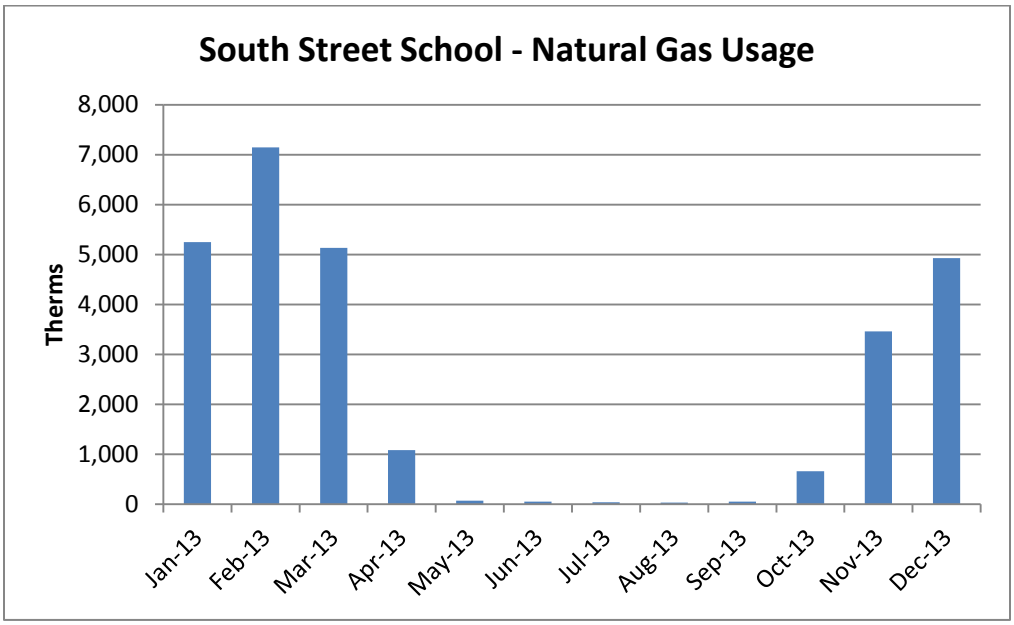
For the 12-month period ending in December 2013, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	148,920	kWh
Annual Cost	$22,205	$
Blended Unit Rate	$0.15	$/kWh
Supply Rate	$0.13	$/kWh
Demand Rate	$4.99	$/kW
Peak Demand	42.4	kW
Natural Gas		
Annual Consumption	27,911	Therms
Annual Cost	$27,455	$
Unit Rate	$0.98	$/therm

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



Following this chart it can be seen that the electricity used by this school remains fairly constant all year round and drops a little bit during the summer when school is out of session. It is likely that the major contributors to electricity usage are lighting and plug load.



Natural gas is used the most during the heating months and is used little to none during the cooling months. This type of load profile is typical when natural gas is used primarily for heating from the boilers and only a little by the domestic hot water heater. Included in the baseline usage is also some kitchen usage; however the exact monthly amount is difficult to quantify using utility data alone.

In addition, domestic water and sewer services are provided by City of Newark Division of Water at $7.41/1000 gal.

See Appendix A for a detailed utility analysis.

Under New Jersey's energy deregulation law, the supply portion of the electric (or natural gas) bill is separated from the delivery portion. 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	Y	$0.13	$0.12	Y
Natural Gas	Y	$0.98	$0.95	Y

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

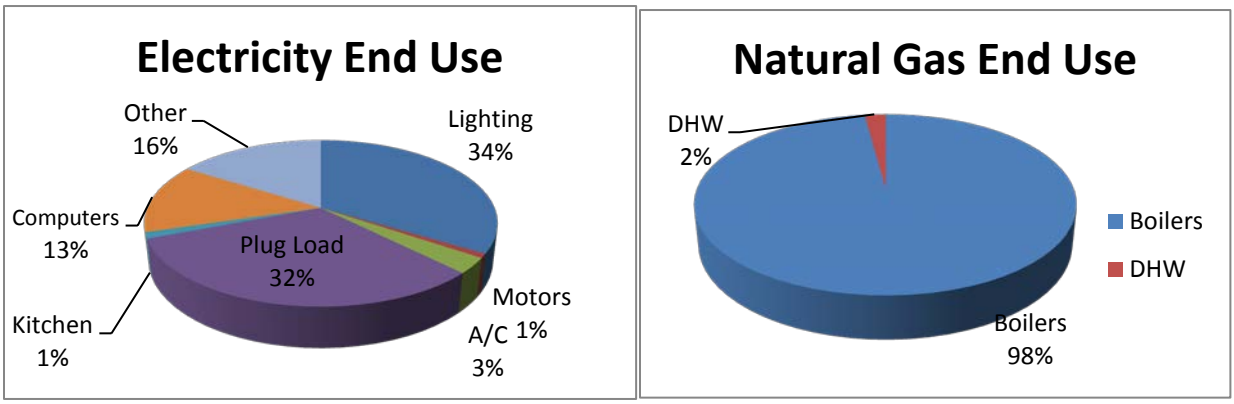
Additional information on selecting a third party energy supplier is available here:

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

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

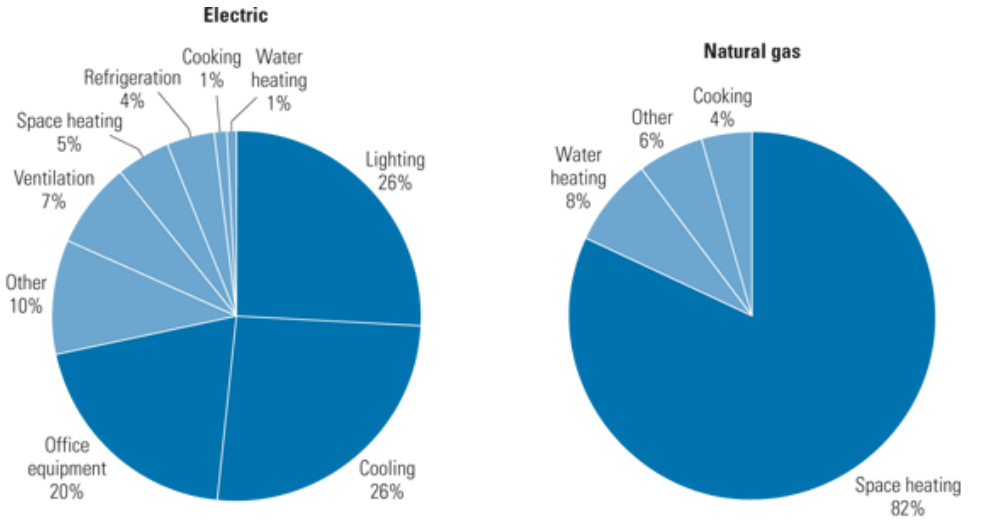
The charts below represent estimated utility end-use utility profiles for the building. The values used within the charts were estimated from a review of the utility analysis and the energy savings calculations.

Site End-Use Utility Profile



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

Typical End-Use Utility Profile for Educational Facilities



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

4.0 BENCHMARKING

TRC has previously benchmarked this building, the results of which have been provided to NPS. The results are summarized below. Copies of the benchmarking report are available in Appendix G.

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

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

Site EUI kBtu/ft^2/yr	Energy Star Rating (1-100)
111.8*	44**

* Calculated by CHA using Utility Data provided by NPS
** Provided by TRC

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

5.0 ENERGY CONSERVATION MEASURES

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

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

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

Energy savings were quantified in the form of:

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

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

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

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

5.1 ECM-1 Replace Door Sweeps and Seals

Exterior doors throughout the school have door sweeps and seals which have deteriorated over time. Presently, gaps exist which allow for infiltration of outdoor air or exfiltration of indoor air, wasting steam heat generated by the boiler system and therefore natural gas.

The seals around exterior doors fail over time. This leads to infiltration of unconditioned outside air or exfiltration of conditioned air resulting in increased heating energy usage. This measure calls for the replacement of all exterior door seals. Replacement of these seals will result in a reduction of the buildings heating and cooling loads, therefore providing natural gas and electricity savings. The linear footage of gap and wind speed is used to estimate the infiltration rate, which is then multiplied by the BIN weather data and the equipment efficiencies to determine the annual energy savings.

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

ECM-1 Replace Door Sweeps and Seals

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
2,074	0	0	472	463	1.2	0	4.5	4.5

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

This measure is recommended.

5.2 ECM-2 Convert Steam System to Hot Water & Install High Efficiency Condensing Boilers

The heating system consists of two (2) natural gas fired steam boilers. The boilers have a nameplate efficiency of 80%, but due to their approximate age, 24 years it is estimated that the current efficiency is closer to 65%.

Steam heating systems are inherently inefficient and high maintenance as 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 an 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. 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-2 Convert Steam System to Hot Water & Install High Efficiency Condensing Boilers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
960,908	0	0	10,511	10,301	(0.7)	3,000	93.3	93.0

* 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 high cost and long payback. As long as the boilers are maintained properly they should continue to operate beyond their service life. This ECM should only be pursued if a major portion of the steam system, such as the distribution piping fails in the future.

5.3 ECM-3 Install Window A/C Controller

There are approximately three (3) window air conditioners located throughout the school; one in the teachers' lounge, one in the main office and one in the computer room.

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

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

ECM-3 Install Window A/C Controller

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
600	0	2,618	0	393	8.8	0	1.5	1.5

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

This measure is recommended.

5.4.1 ECM-4A Install Basic Controls

The building uses steam boilers that are currently controlled manually by the building operators. Steam pressure is maintained at 3 psi most of the day with no regard to space temperature. Classrooms are overheated as a result and the teachers open the windows in an attempt to cool the rooms down. No night temperature set-back is implemented, unless the operator remembers to turn the boilers off before their shift ends. This highly inefficient method of operation consumes excessive fuel (natural gas).

A Basic control system is recommended to l provide automatic control of the boiler(s) to produce only enough steam needed to heat the building, based on a single or multiple averaging space thermostats. This system will provide more tenable space temperatures but will not provide for independent room temperature control. Installation of thermostatic control valves (thermostatic radiator valves, TRVs) could be considered to further regulate specific room temperatures however these will not result in further significant fuel savings beyond the proposed basic control system.

ECM-4A Install Basic Controls

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
21,309	0	0	2,770	2,715	0.9	0	7.8	7.8

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

This measure is recommended.

5.4.2 ECM-4B Install Full DDC Controls

A Full Direct Digital Control (DDC) building automation system consists of automatic control of individual space heating and ventilation equipment, and provides monitoring, trending and alarms which notify an operator when a piece of equipment fails or operates outside a given set-point. This system allows for the implementation of energy efficient strategies, such as: time of day (TOD) optimization, set point optimization, staggered start, night setback, temporary daytime setback, economizer (free cooling), demand control ventilation, exhaust fan shut down, and holiday TOD optimization. It also allows for remote access and control of the building's systems. This ECM is recommended only if the building HVAC system is to be fully renovated to include new boilers, pumps and ventilation equipment as it will optimize the energy savings potential of the new systems.

Energy savings are generated from temperature reduction during the day and night as well as other controls sequences mentioned above, as applicable to the proposed HVAC system improvements. The savings is estimated at 10% overall energy reduction based on past experience with similar sized school buildings having fully functioning digital controls.

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

ECM-4B Install Full DDC Controls

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
250,000	0	0	4,361	4,274	(0.7)	0	58.5	58.5

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

This measure is not recommended in lieu of ECM-4A and due to the high cost of implementation and long payback period.

5.5 ECM-5 Install Low Flow Plumbing Fixtures

The plumbing fixtures in this building are older high flow fixtures. The water savings associated from replacing existing high flow fixtures with low-flow fixtures was calculated by taking the difference of the annual water usage for the proposed and base case. The basis of this calculation is the estimate usage of each fixture, gallons per use, and number of fixtures. Replacing the existing fixtures in the restrooms with 1.28 Gals/flush toilets, 1.0 gal/flush urinals, and 0.5 gpm faucets will conserve water which will result in lower annual water and sewer charges. Facets with low-flow push valves were not considered for replacement.

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

ECM-5 Install Low Flow Plumbing Fixtures

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Water	Total				
$	kW	kWh	Therms	kGal	$		$	Years	Years
52,906	0	0	0	39	292	(0.8)	0	181.2	181.2

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

These measures are not recommended due to the long payback period.

5.6.1 ECM-L1 Lighting Replacement / Upgrades

The existing lighting system consists of mostly T8 linear fluorescent fixtures which until recently represented the most efficient lighting technology available. Exterior lighting includes 1000W wall mounted area light fixtures. 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
32,608	10.4	28,588	0	4,339	1.3	400	7.5	7.4

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

This measure is not recommended in lieu of ECM L3.

5.6.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

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

This measure recommends installing occupancy sensors for the current lighting system. Using a process similar to that utilized in Section 5.6.1, the energy savings for this measure was calculated by applying the known fixture wattages in the space to the estimated existing and proposed times of operation for each fixture.

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

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
8,586	0	9,938	0	1,292	1.6	1,105	6.6	5.8

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

This measure is not recommended in lieu of ECM L3.

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

This measure is a combination of ECM-L1 and ECM-L2; recommending replace/upgrade the current lighting fixtures to more efficient ones and installing occupancy sensors on

the new lights. 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
40,924	10.4	33,355	0	4,959	1.1	1,505	8.3	7.9

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

This measure is recommended.

5.7 Additional O&M Opportunities

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

- Install Covers on Window Air Conditioners
- Clean Window AC filters before each season
- Perform a steam trap assessment yearly to ensure steam traps are functioning properly.
- Replace Unit Ventilator filters at least twice a year
- Clear surface above unit ventilators of materials, plants, or books
- Set computers monitors to turn off and computers to sleep mode when not in use
- Look for the ENERGY STAR® label when purchasing Window AC units or Kitchen Appliances
- Disconnect unnecessary or unused small appliances and electronics when not in use to reduce phantom loads
- Train custodians to turn off lights and set HVAC temperatures to minimum levels when rooms are unoccupied
- Develop an Energy Master Plan to measure and track energy performance
- Educate students and staff about how their behavior affects energy use. Create student energy patrols to monitor and inform administration when energy is being wasted.
- During the winter, Custodians should ensure all windows are closed as part of cleaning routine

6.0 PROJECT INCENTIVES

6.1 Incentives Overview

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

6.1.1 New Jersey Smart Start Program

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

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

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

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

6.1.2 Direct Install Program

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

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

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

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

The building qualifies for this program because its electrical demand is less 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% IRR 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 D, along with more detailed program information.

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 ECM-S1 Photovoltaic Rooftop Solar Power Generation

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

Available Roof Area (Ft^2)	Potential PV Array Size (kW)
3,385	10

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

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey Solar Renewable Energy Certificates Program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. Payments that will be received by the PV producer (school) will change from year to year dependent upon supply and demand. There is no definitive way to calculate an exact price that will be received by the PV producer for SREC credits over the next 15 years. Renewable Energy Consultants estimates an average of $155/SREC for 2013 and this number was utilized in the cash flow for this report.

The system costs for PV installations were derived from recent solar contractor budgetary pricing in the state of New Jersey and include the total cost of the system installation (PV panels, inverters, wiring, ballast, controls). The cost of installation is currently about $4.00 per watt or $4,000 per kW of installed system, for a typical system. There are other considerations that have not been included in this pricing, such as the condition of the roof and need for structural reinforcement. Photovoltaic systems can be ground mounted if the roof is not suitable, however, this installation requires a substantial amount of open property (not wooded) and underground wiring, which adds more cost. PV panels have an approximate 20 year life span; however, the inverter device that converts DC electricity to AC has a life span of 10 to 12 years and will most likely need to be replaced during the useful life of the PV system.

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

Photovoltaic (PV) Rooftop Solar Power Generation – 10 kW System

Budgetary Cost	Annual Utility Savings			Total Savings	New Jersey Renewable SREC	Payback (without SREC)	Payback (with SREC)	Recommended
	Electricity		Natural Gas					
$	kW	kWh	Therms	$	$	Years	Years	Y/N
40,000	10.0	12,796	0	1,908	1,983	21.0	10.3	FS

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

7.1.2 ECM-S2 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.

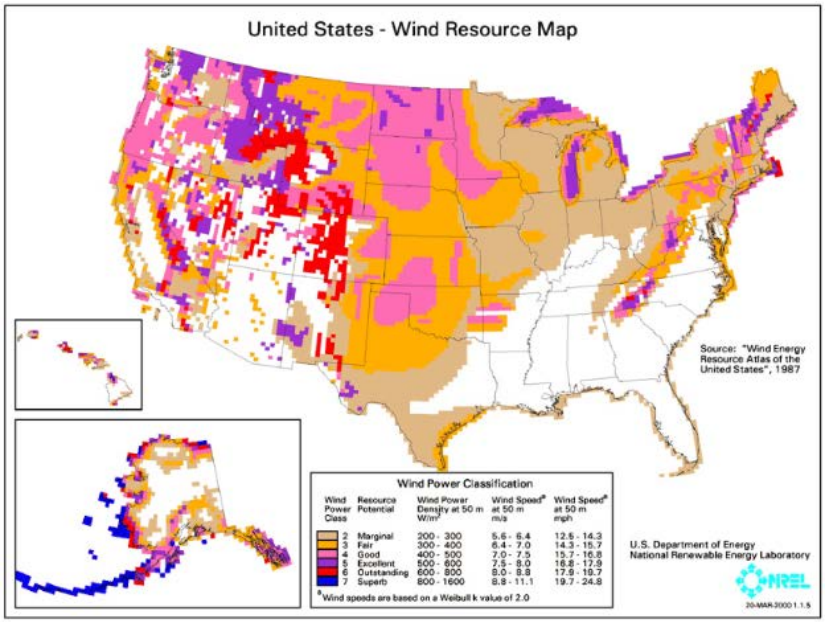
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping). 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 low domestic hot water usage in this building.

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 building.

7.3 Combined Heat and Power Plant

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

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. The building has sufficient need for electrical generation and the ability to use most of the thermal byproduct during the winter; however thermal

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

This measure is not recommended due to the low thermal building load in the summer.

7.4 Demand Response Curtailment

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

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

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

Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
42.4	23.2	36.2	Y	N

This measure is not recommended because the building does not have adequate load to meet the required minimum load reduction.

8.0 CONCLUSIONS & RECOMMENDATIONS

The LGEA energy audit conducted by CHA for the building identified potential annual savings of $8,529/yr with an overall payback of 7.6 years, if the recommended ECMs are implemented.

The potential annual energy, cost savings and payback are shown in the following table.

Electric Savings (kWh)	Natural Gas Savings (therms)	Total Savings ($)	Payback (years)
35,973	3,242	8,529	7.6

The following projects should be considered for implementation:

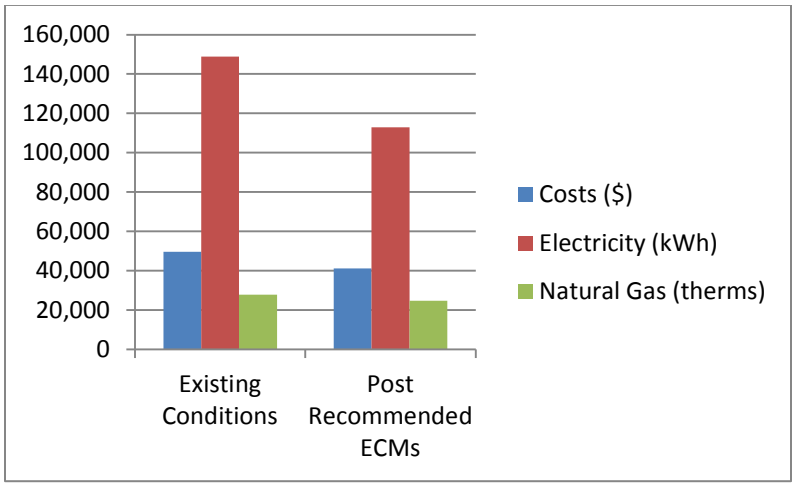
- Install Door Sweeps and Seals
- Install Window A/C Controller
- Install Basic Controls
- Lighting Replacements with Controls (Occupancy Sensors)

The following alternative energy measures are recommended for further study:

- Photovoltaic (PV) Rooftop Solar Power Generation – 10 kW System

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	49,660	41,131	17%
Electricity (kWh)	148,920	112,947	24%
Natural Gas (therms)	27,911	24,669	12%
Site EUI (kbtu/SF/Yr)	111.8	96.7	



APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

Newark Public Schools LGEA
CHA Project# 27999

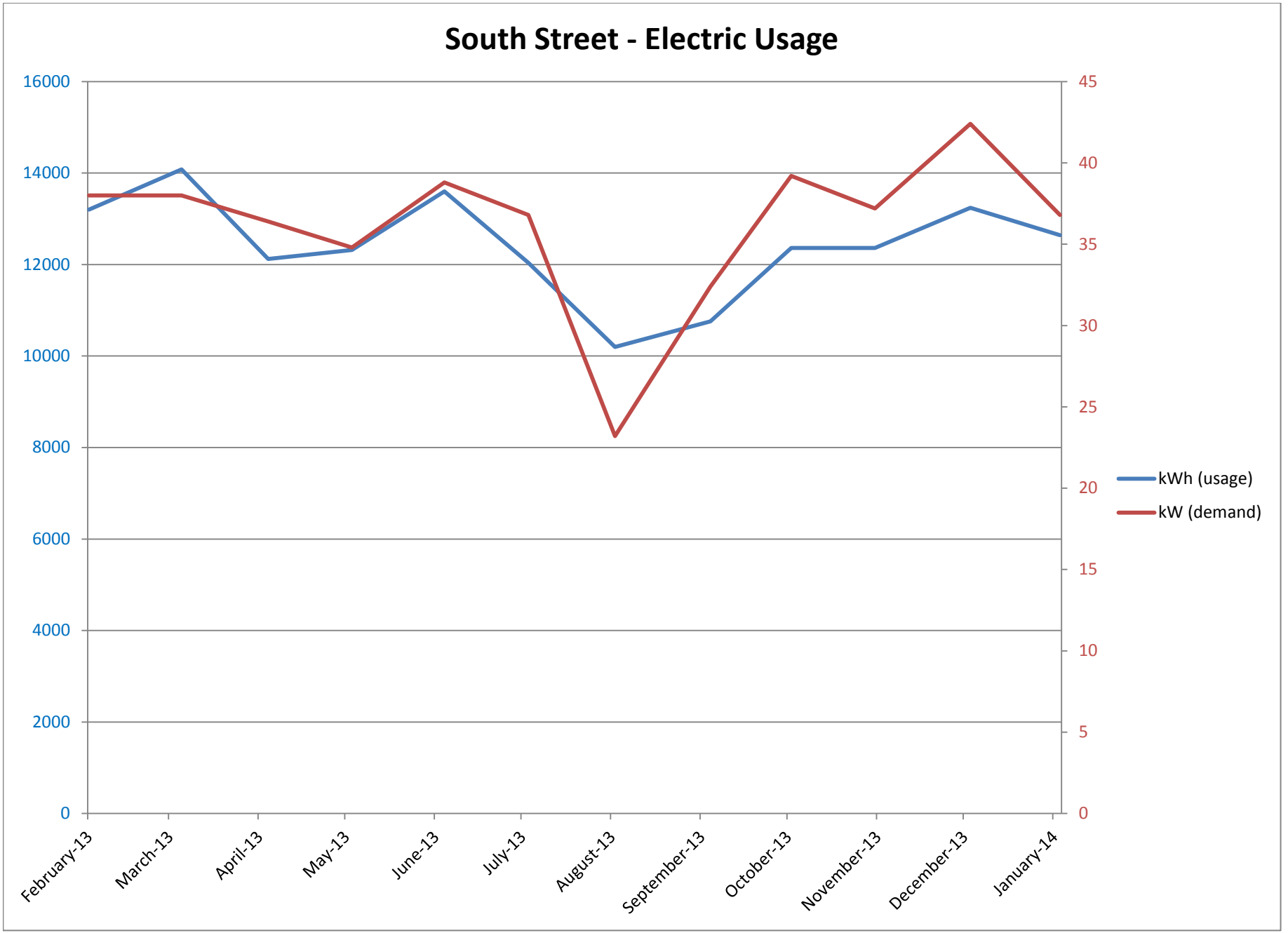
South Street - Electric Usage

Index No	Current Name	Address NJIT PSS	Acct	Meter	Start Date	End Date	kWh	Demand Usage (KW)	Total Charge	Supply Charge	Delivery Charge	Demand Charge	Consumption ($)
70	South Street	151 South St., 07114	2147483647	9196037	1/5/2012	2/2/2012	13160	39.2	2,250.00	0	426.31	166.07	2083.93
70	South Street	151 South St., 07114	2147483647	9196037	2/3/2012	3/5/2012	13760	39.6	2,345.00	0	445.55	167.77	2177.23
70	South Street	151 South St., 07114	2147483647	9196037	3/6/2012	4/2/2012	11640	36.4	1,985.00	0	377.59	154.21	1830.79
70	South Street	151 South St., 07114	2147483647	9196037	4/3/2012	5/3/2012	12880	38.4	2,190.00	0	417.33	162.68	2027.32
70	South Street	151 South St., 07114	2147483647	9196037	5/4/2012	6/4/2012	14120	41.6	2,395.00	0	875.31	176.24	2218.76
70	South Street	151 South St., 07114	2147483647	9196037	6/5/2012	7/3/2012	11760	38	2,085.66	1,151.72	772.95	160.99	1924.67
70	South Street	151 South St., 07114	2147483647	9196037	7/4/2012	8/2/2012	11160	23.2	1,871.14	1,139.01	633.84	98.29	1772.85
70	South Street	151 South St., 07114	2147483647	9196037	8/3/2012	8/30/2012	9160	22.8	1,611.65	963.96	551.1	96.59	1515.06
70	South Street	151 South St., 07114	2147483647	9196037	8/31/2012	12/3/2012	38880	39.2	5,469.81	3,662.08	1,314.60	493.13	4976.68
70	South Street	151 South St., 07114	2147483647	9196037	12/4/2012	1/3/2013	12440	36.8	1,750.56	1,175.34	419.16	156.06	1594.5
70	South Street	151 South St., 07114	2147483647	9196037	1/4/2013	2/1/2013	13200	38	1,833.91	1,219.22	452.03	162.66	1671.25
70	South Street	151 South St., 07114	2147483647	9196037	2/2/2013	3/5/2013	14080	38	1,930.63	1,312.85	455.12	162.66	1767.97
70	South Street	151 South St., 07114	2147483647	9196037	3/6/2013	4/4/2013	12120	36.4	1,726.60	1,178.42	392.37	155.81	1570.79
70	South Street	151 South St., 07114	2147483647	9196037	4/5/2013	5/3/2013	12320	34.8	1,762.06	1,214.33	398.77	148.96	1613.1
70	South Street	151 South St., 07114	2147483647	9196037	5/4/2013	6/4/2013	13600	38.8	2,329.56	1,323.36	531.89	474.31	1855.25
70	South Street	151 South St., 07114	2147483647	9196037	6/5/2013	7/3/2013	12040	36.8	2,112.81	1,170.43	784.86	157.52	1955.29
70	South Street	151 South St., 07114	2147483647	9196037	7/4/2013	8/2/2013	10200	23.2	1,724.44	1,022.92	602.21	99.31	1625.13
70	South Street	151 South St., 07114	2147483647	9196037	8/3/2013	9/4/2013	10760	32.4	1,808.32	971.63	698	138.69	1669.63
70	South Street	151 South St., 07114	2147483647	9196037	9/5/2013	10/2/2013	12360	39.2	1,708.92	1,116.11	425.01	167.8	1541.12
70	South Street	151 South St., 07114	2147483647	9196037	10/3/2013	10/31/2013	12360	37.2	1,701.53	1,116.11	426.19	159.23	1542.3
70	South Street	151 South St., 07114	2147483647	9196037	11/1/2013	12/3/2013	13240	42.4	1,833.29	1,195.57	456.23	181.49	1651.8
70	South Street	151 South St., 07114	2147483647	9196037	12/4/2013	1/3/2014	12640	36.8	1,732.48	1,141.39	433.57	157.52	1574.96

South Street		Start Date	End Date	Months
151 South St., 07114		1/5/2012	1/3/2014	23
Account Number	2147483647			
Meter Number	9196037			

ELECTRIC USAGE - MOST RECENT 12 MONTHS, PERIOD ENDING: 1/3/2014

Total Usage	148,920	**kwh**
Total Charges	$22,205	
Blended Rate	$0.15	**$/kWh**
Consumption Rate	$0.13	**$/kWh**
Demand Rate	$4.99	**$/kW**
Max Demand	42.4	**kW**
Min Demand	23.2	**kW**
Avg Demand	36.2	**kW**


South Street - Electric Usage
16000
14000
12000
10000
8000
6000
4000
2000
0
45
40
35
30
25
20
15
10
5
0
February-13
March-13
April-13
May-13
June-13
July-13
August-13
September-13
October-13
November-13
December-13
January-14
kWh (usage)
kW (demand)

Newark Public Schools LGEA
CHA Project# 27999

South Street - Natural Gas Usage

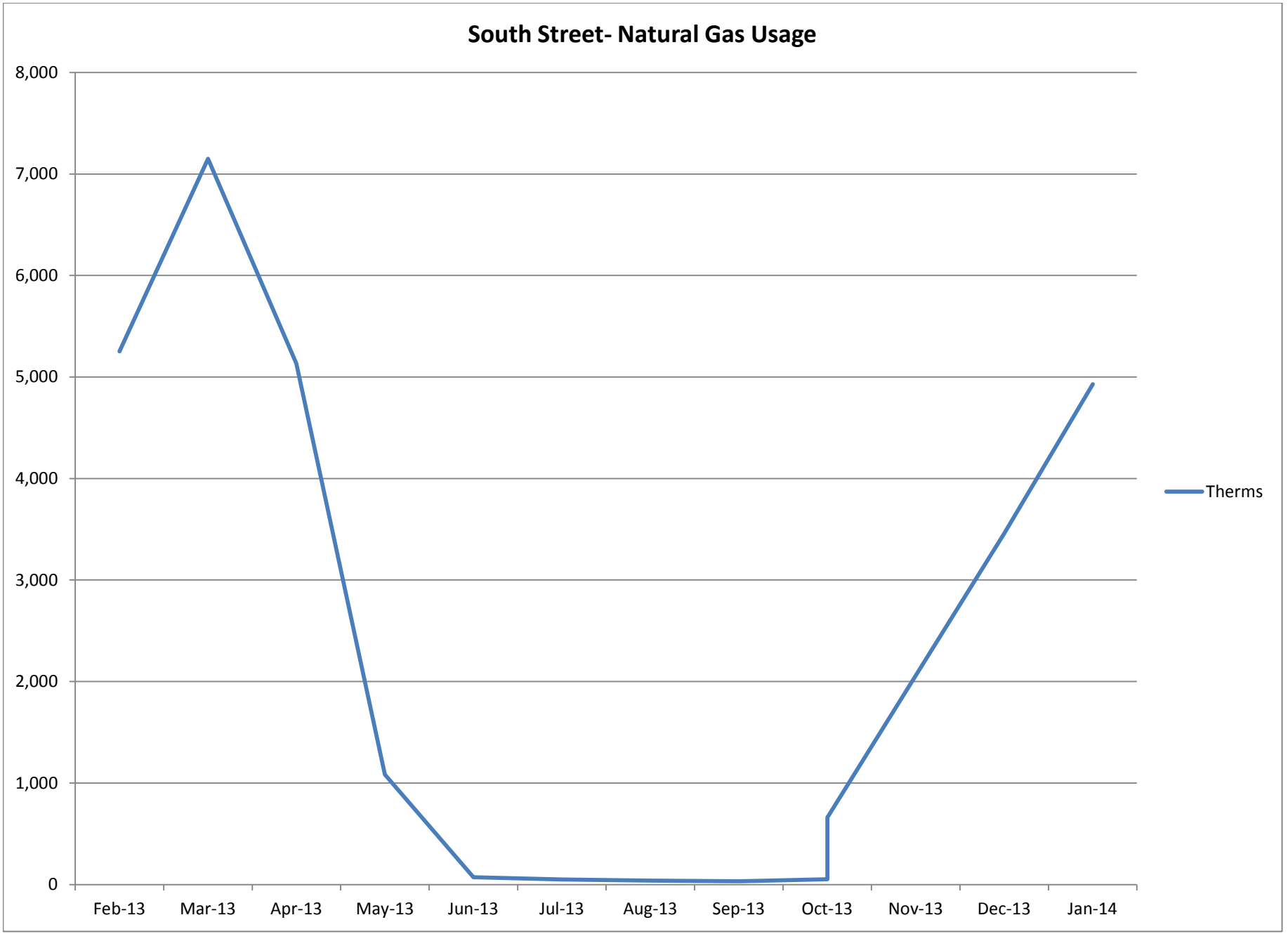
Index No	Current Name	Acct	Meter	Start Date	End Date	Therms	Total Charge	$/therm
70	South Street	6536119908	2415185, 3078938	2/3/2012	3/5/2012	3,733.69	3,226.09	0.86
70	South Street	6536119908	2415185, 3078938	3/6/2012	4/2/2012	1,898.17	1,281.50	0.68
70	South Street	6536119908	2415185, 3078938	4/3/2012	5/3/2012	1,560.75	1,042.46	0.67
70	South Street	6536119908	2415185, 3078938	5/4/2012	6/4/2012	82.17	160.3	1.95
70	South Street	6536119908	2415185, 3078938	6/5/2012	7/3/2012	49.77	145.65	2.93
70	South Street	6536119908	2415185, 3078938	7/4/2012	8/2/2012	17.17	121.96	7.10
70	South Street	6536119908	2415185, 3078938	8/3/2012	8/30/2012	12.87	119.32	9.27
70	South Street	6536119908	2415185, 3078938	8/31/2012	12/3/2012	4,679.65	5,145.06	1.10
70	South Street	6536119908	2415185, 3078938	12/4/2012	1/3/2013	4,919.55	4,894.03	0.99
70	South Street	6536119908	2415185, 3078938	1/4/2013	2/1/2013	5,251.52	4,984.79	0.95
70	South Street	6536119908	2415185, 3078938	2/2/2013	3/5/2013	7,149.08	6,791.71	0.95
70	South Street	6536119908	2415185, 3078938	3/6/2013	4/4/2013	5,131.86	3,736.04	0.73
70	South Street	6536119908	2415185, 3078938	4/5/2013	5/3/2013	1,083.51	951.91	0.88
70	South Street	6536119908	2415185, 3078938	5/4/2013	6/4/2013	72.82	176.26	2.42
70	South Street	6536119908	2415185, 3078938	6/5/2013	7/3/2013	49.77	145.65	2.93
70	South Street	6536119908	2415185, 3078938	7/4/2013	8/2/2013	39.08	144.37	3.69
70	South Street	6536119908	2415185, 3078938	8/3/2013	9/4/2013	32.63	138.52	4.25
70	South Street	6536119908	2415185, 3078938	9/5/2013	10/2/2013	51.82	156.08	3.01
70	South Street	6536119908	2415185, 3078938	10/3/2013	10/31/2013	660.43	1,510.81	2.29
70	South Street	6536119908	2415185, 3078938	11/1/2013	12/3/2013	3,459.25	3,689.36	1.07
70	South Street	6536119908	2415185, 3078938	12/4/2013	1/3/2014	4,928.97	5,029.77	1.02

South Street		Start Date	End Date	# Months
Account Number	6536119908	2/3/2012	1/3/2014	23
Meter Number	2415185, 3078938			

NATURAL GAS USAGE - MOST RECENT 12 MONTHS, PERIOD ENDING: 1/3/2014

Annual Usage	27,911	**Therms**
Annual Cost	$27,455	
Rate	$0.98	**$/Therm**

Bill Missing. Data from previous year used.


South Street- Natural Gas Usage
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Therms

PSE&G ELECTRIC SERVICE TERRITORY
Last Updated: 10/24/12

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

Supplier	Telephone & Web Site	*Customer Class
AEP Energy, Inc. 309 Fellowship Road, Fl. 2 Mount Laurel, NJ 08054	(866) 258-3782 www.aepenergy.com	**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 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877)-30-AMBIT (877) 302-6248 www.ambitenergy.com	**R/C** **ACTIVE**
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com	**C** **ACTIVE**
Amerigreen Energy, Inc. 1463 Lamberton Road Trenton, NJ 08611	888-423-8357 www.amerigreen.com	**R/C** **ACTIVE**
AP Gas & Electric, LLC 10 North Park Place, Suite 420 Morristown, NJ 07960	(855) 544-4895 www.apge.com	**R/C/I** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(201) 384-5552 www.astralenergyllc.com	**R/C/I** **ACTIVE**
Barclays Capital Services, Inc. 70 Hudson Street Jersey City, NJ 07302-4585	(888) 978-9974 www.group.barclays.com	**C** **ACTIVE**
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	(888) 651-4121 www.greateasternenergy.com	**C/I** **ACTIVE**
Champion Energy Services, LLC 72 Avenue L Newark, NJ 07105	(877) 653-5090 www.championenergyservices.com	**R/C/I** **ACTIVE**

Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	888-565-4490 www.4choiceenergy.com	**R/C** **ACTIVE**
Clearview Electric, Inc. 505 Park Drive Woodbury, NJ 08096	(888) CLR-VIEW (800) 746-4702 www.clearviewenergy.com	**R/C/I** **ACTIVE**
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07446	1-866-587-8674 www.commerceenergy.com	**R** **ACTIVE**
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	**C/I** **ACTIVE**
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(866) 237-7693 www.constellation.com	**R/C/I** **ACTIVE**
Constellation Energy 900A Lake Street, Suite 2 Ramsey, NJ 07446	(877) 997-9995 www.constellation.com	**R** **ACTIVE**
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 www.directenergybusiness.com	**C/I** **ACTIVE**
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 348-4193 www.directenergy.com	**R** **ACTIVE**
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, New Jersey 08002	(800) 282-3331 www.discountenergygroup.com	**R/C** **ACTIVE**
Dominion Retail, Inc. **d/b/a Dominion Energy Solutions** 395 Route #70 West Suite 125 Lakewood, NJ 08701	(866) 275-4240 www.dom.com/products	**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**
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 www.fes.com	**C/I** **ACTIVE**
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com	**R/C/I** **ACTIVE**
GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, NJ 08837	(866) 999-8374 www.gdfsuezenergyresources.com	**C/I** **ACTIVE**
Glacial Energy of New Jersey, Inc. 75 Route 15 Building E Lafayette, NJ 07848	(888) 452-2425 www.glacialenergy.com	**C/I** **ACTIVE**
Global Energy Marketing LLC 129 Wentz Avenue Springfield, NJ 07081	(800) 542-0778 www.globalp.com	**C/I** **ACTIVE**
Green Mountain Energy Company 211 Carnegie Center Drive Princeton, NJ 08540	(866) 767-5818 www.greenmountain.com/commercial-home	**C/I** **ACTIVE**

Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	**R/C** **ACTIVE**
HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Ridgefield, NJ 07657	(877) 390-7155 www.hopenergy.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 3711 Market Street, 10th Fl. Philadelphia, PA 19104	(877) 235-6708 www.chooseindependence.com	**R/C** **ACTIVE**
Integrys Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrysenergy.com	**C/I** **ACTIVE**
Keil & Sons, Inc. **d/b/a Systrum Energy** 1 Bergen Blvd. Fairview, NJ 07022	(877) 797-8786 www.systrumenergy.com	**R/C/I** **ACTIVE**
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	**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**
MXenergy Electric Inc. 900 Lake Street Ramsey, NJ 07446	(800) 785-4374 www.mxenergy.com	**R/C/I** **ACTIVE**
NATGASCO, Inc. 532 Freeman St. Orange, NJ 07050	(973) 678-1800 x. 251 www.supremeenergyinc.com	**R/C** **ACTIVE**
NextEra Energy Services New Jersey, LLC 651 Jernee Mill Road Sayreville, NJ 08872	(877) 528-2890 Commercial (800) 882-1276 Residential www.nexteraenergyservices.com	**R/C/I** **ACTIVE**
New Jersey Gas & Electric 1 Bridge Plaza fl. 2 Fort Lee, NJ 07024	(866) 568-0290 www.NJGandE.com	**R/C** **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**
North American Power and Gas, LLC 222 Ridgedale Avenue Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
Palmco Power NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) ENERGY-9 (363-7499) www.pepco-services.com	**C/I** **ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**

PPL Energy Plus, LLC 811 Church Road Cherry Hill, NJ 08002	(800) 281-2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Public Power & Utility of New Jersey, LLC 39 Old Ridgebury Rd. Suite 14 Danbury, CT 06810	(888) 354-4415 www.ppandu.com	**R/C/I** **ACTIVE**
Reliant Energy 211 Carnegie Center Princeton, NJ 08540	(877) 297-3795 (877) 297-3780 www.reliant.com/pjm	**R/C/I** **ACTIVE**
ResCom Energy LLC 18C Wave Crest Ave. Winfield Park, NJ 07036	(888) 238-4041 http://rescomenergy.com	**R/C/I** **ACTIVE**
Respond Power LLC 10 Regency CT Lakewood, NJ 08701	(877) 973-7763 www.respondpower.com	**R/C/I** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 266-6020 www.southjerseyenergy.com	**C/I** **ACTIVE**
Sperian Energy Corp. 1200 Route 22 East, Suite 2000 Bridgewater, NJ 08807	(888) 682-8082	**R/C/I** **ACTIVE**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, N.J. 08007	(800) 695-0666 www.sjnaturalgas.com	**R/C** **ACTIVE**
Spark Energy, L.P. 2105 CityWest Blvd., Ste 100 Houston, Texas 77042	(800) 441-7514 www.sparkenergy.com	**R/C/I** **ACTIVE**
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	(800) 225-1560 www.spragueenergy.com	**C/I** **ACTIVE**
Starion Energy PA Inc. 101 Warburton Avenue Hawthorne, NJ 07506	(800) 600-3040 www.starionenergy.com	**R/C/I** **ACTIVE**
Stream Energy 309 Fellowship Rd., Suite 200 Mt. Laurel, NJ 08054	(877) 39-8150 www.streamenergy.net	**R** **ACTIVE**

UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 50 East Palisades Avenue Englewood, NJ 07631	(800) 388-3862 www.lowcostpower.com	**R/C/I** **ACTIVE**
Viridian Energy 2001 Route 46, Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	**R/C/I** **ACTIVE**
Xoom Energy New Jersey, LLC 744 Broad Street Newark, 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: 10/24/12

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

Supplier	Telephone & Web Site	*Customer Class
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877)-30-AMBIT (877) 302-6248 www.ambitenergy.com	**R/C** **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/I** **ACTIVE**
Clearview Electric Inc. **d/b/a Clearview Gas** 1744 Lexington Ave. Pennsauken, NJ 08110	800-746-4720 www.clearviewenergy.com	**R/C** **ACTIVE**
Colonial Energy, Inc. 83 Harding Road Wyckoff, NJ 07481	845-429-3229 www.colonialgroupinc.com	**C/I** **ACTIVE**
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07746	(888) 817-8572 www.commerceenergy.com	**R** **ACTIVE**
Compass Energy Services, Inc. 1085 Morris Avenue, Suite 150 Union, NJ 07083	866-867-8328 908-638-6605 www.compassenergy.net	**C/I** **ACTIVE**
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 900A Lake Street, Suite 2 Ramsey, NJ 07466	(800) 900-1982 www.constellation.com	**C/I** **ACTIVE**
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 www.directenergy.com	**C/I** **ACTIVE**
Direct Energy Services, LLP 120 Wood Avenue, Suite 611 Iselin, NJ 08830	866-348-4193 www.directenergy.com	**R** **ACTIVE**
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	800-805-8586 www.gesc.com	**R/C/I** **ACTIVE**
UGI Energy Services, Inc. **d/b/a GASMARK** 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergyservices.com	**C/I** **ACTIVE**
Global Energy Marketing, LLC 129 Wentz Avenue Springfield, NJ 07081	800-542-0778 www.globalp.com	**C/I** **ACTIVE**
Great Eastern Energy 116 Village Blvd., Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	**C/I** **ACTIVE**
Greenlight Energy 330 Hudson Street, Suite 4 Hoboken, NJ 07030	718-204-7467 www.greenlightenergy.us	**C** **ACTIVE**
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	**C/I** **ACTIVE**
Hess Small Business Services, LLC One Hess Plaza Woodbridge, NJ 07095	888-494-4377 www.hessenergy.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	**R/C** **ACTIVE**

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**
Integrys Energy Services – Natural Gas, LLC 99 Wood Avenue South Suite #802 Iselin, NJ 08830	800-536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	800-927-9794 www.intelligentenergy.org	**R/C/I** **ACTIVE**
Keil & Sons, Inc. **d/b/a Systrum Energy** 1 Bergen Blvd. Fairview, NJ 07022	1-877-797-8786 www.systrumenergy.com	**R/C/I** **ACTIVE**
Major Energy Services, LLC 10 Regency CT Lakewood, NJ 08701	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	800-828-9427 www.metromediaenergy.com	**C** **ACTIVE**
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	888-53-Metro www.metroenergy.com	**R/C** **ACTIVE**
MxEnergy, Inc. 900 Lake Street Ramsey, NJ 07446	800-758-4374 www.mxenergy.com	**R/C/I** **ACTIVE**
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	800-840-4GAS www.natgasco.com	**C** **ACTIVE**
New Energy Services LLC 101 Neptune Avenue Deal, New Jersey 07723	800-660-3643 www.newenergyservicesllc.com	**R/C/I** **ACTIVE**

New Jersey Gas & Electric 1 Bridge Plaza, Fl. 2 Fort Lee, NJ 07024	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. 3000 East Brunswick, NJ 08816	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	800-363-7499 www.pepco-services.com	**C/I** **ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	855-32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**
PPL EnergyPlus, LLC 811 Church Road - Office 105 Cherry Hill, NJ 08002	800-281-2000 www.pplenergyplus.com	**C/I** **ACTIVE**
Respond Power LLC 10 Regency CT Lakewood, NJ 08701	(877) 973-7763 www.respondpower.com	**R/C/I** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	800-266-6020 www.southjerseyenergy.com	**C/I** **ACTIVE**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	800-695-0666 www.sjnaturalgas.com	**R/C** **ACTIVE**
Spark Energy Gas, L.P. 2105 CityWest Blvd, Ste 100 Houston, Texas 77042	800-411-7514 www.sparkenergy.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	(973) 494-8097 www.streamenergy.net	**R/C** **ACTIVE**
Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	877-797-8786 www.systrumenergy.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 Newark, NJ 07102	888-997-8979 www.xoomenergy.com	**R/C/I** **ACTIVE**
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	(855) 732-2493 www.thisisyourenergy.com	**R/C/I** **ACTIVE**

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APPENDIX B

Equipment Inventory

Newark Public School District
CHA Project# 27999
South Street Elementary School

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)
B-1	1	Burnham Corporation	EL 80	9014732	Steam Boiler / Natural Gas	3,348 MBH in, 80% efficient	MER	School Heating System (Radiators)	1990	2
B-2	1	Burnham Corporation	EL 80	*Unknown*	Steam Boiler / Natural Gas	3,348 MBH in, 80% efficient	MER	School Heating System (Radiators)	1990	2
Burner-1	1	Industrial Combustion	PG-34	31430-1	Natural Gas fired burner	*Unknown*	MER	Steam Boiler-1	1990	2
Burner-2	1	Industrial Combustion	PG-34	31430-2	Natural Gas fired burner	*Unknown*	MER	Steam Boiler-2	1990	2
DHW-1	1	State Industries, Inc	SBF70360NWASME	J99280608	Hot Water Heater / Natural Gas	360,000 BTU in, 70 gallon	MER	School Domestic Hot Water Loop	1996	3
Generator	1	Kohler	*Unknown*	*Unknown*	Natural Gas fired Generator	12 kW	MER	Emergency System	*2000*	7
Window AC	1	Friedrich	RS15J10-A	LBLR10533	Window Air Conditioning Unit	14,500 btu/hr, 11.1 EER	Teachers Lounge	Teachers Lounge	*2010*	12
Window AC	1	Friedrich	*Unknown*	*Unknown*	Window Air Conditioning Unit	12,000 btu/hr, 10.0 EER	Library	Library	*2010*	12
Window AC	1	Friedrich	*Unknown*	*Unknown*	Window Air Conditioning Unit	12,000 btu/hr, 10.0 EER	Computer Room	Computer Room	*2010*	12
Condensing Unit	1	Comfort Maker	*Unknown*	*Unknown*	Split System Condensing Unit	2 Tons	Main Office	Main Office	*2000*	7
Condensing Unit	1	*Unknown*	*Unknown*	*Unknown*	Split System Condensing Unit	2 Tons	*Unknown*	*Unknown*	*2000*	7
Condensing Unit	1	*Unknown*	*Unknown*	*Unknown*	Split System Condensing Unit	2 Tons	*Unknown*	*Unknown*	*2000*	7

Energy Audit of Newark Public Schools - South Street School
CHA Project No.27999
Existing Lighting & Audit Input

Cost of Electricity: **$0.130** **$/kWh**
$4.99 **$/kW**

			EXISTING CONDITIONS									Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
218LED	Boiler Room	Mechanical Room	6	W 32 C F 3 (ELE)	F43ILL/2	90	0.54	SW	1600	864	NONE	
50LED	Custodial Room	Offices	2	W 32 W P 2 (ELE)	F42LL	60	0.12	SW	2400	288	NONE	
265LED	Custodial Room	Offices	1	2B 32 C F 2 (ELE)	F22LL	31	0.03	SW	2400	74	NONE	
265LED	Boiler Room Stairway	Mechanical Room	2	2B 32 C F 2 (ELE)	F22LL	31	0.06	SW	1600	99	NONE	
265LED	Janitor Closet	Linen/Utility/Wet/Janitor/Electrical	1	2B 32 C F 2 (ELE)	F22LL	31	0.03	SW	1000	31	NONE	
70LED	Main Entrance	Hallways	3	W 32 C F 1	F41LL	32	0.10	SW	3876	372	NONE	
50LED	Main Office	Offices	9	W 32 W P 2 (ELE)	F42LL	60	0.54	SW	2400	1,296	C-OCC	
18LED	Teacher's Lounge	Staff Lounge	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	2400	1,075	C-OCC	
70LED	Gymnasium	Gymnasium	16	W 32 C F 1	F41LL	32	0.51	SW	2000	1,024	NONE	
70LED	Cafeteria	Cafeteria	16	W 32 C F 1	F41LL	32	0.51	SW	2000	1,024	C-OCC	
70LED	Kitchen	Cafeteria	6	W 32 C F 1	F41LL	32	0.19	SW	2000	384	NONE	
70LED	Kitchen Corridor	Cafeteria	2	W 32 C F 1	F41LL	32	0.06	SW	2000	128	NONE	
70LED	Kitchen Office	Cafeteria	1	W 32 C F 1	F41LL	32	0.03	SW	2000	64	OCC	
70LED	Kitchen Office	Cafeteria	1	W 32 C F 1	F41LL	32	0.03	SW	2000	64	OCC	
70LED	Boys Restroom	Restroom	4	W 32 C F 1	F41LL	32	0.13	SW	4300	550	C-OCC	
70LED	Girls Restroom	Restroom	4	W 32 C F 1	F41LL	32	0.13	SW	4300	550	C-OCC	
121LED	Office	Offices	4	W 34 P F 4	F44EE	144	0.58	SW	2400	1,382	OCC	
18LED	Nurse's Office	Offices	9	T 32 R F 4 (ELE)	F44ILL	112	1.01	SW	2400	2,419	NONE	
265LED	Nurse's Office Restroom	Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.03	SW	4300	133	NONE	
50LED	Vice Principal	Offices	2	W 32 W P 2 (ELE)	F42LL	60	0.12	SW	2400	288	OCC	
18LED	Principal - 26	Offices	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	2400	1,075	OCC	
265LED	Men's Walkway	Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.03	SW	4300	133	NONE	
50LED	Men's Restroom	Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.06	SW	4300	258	NONE	
265LED	Women's Walkway	Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.03	SW	4300	133	NONE	
50LED	Women's Restroom	Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.06	SW	4300	258	NONE	
71	Storage	Storage Areas	1	I 60	I60/1	60	0.06	SW	1000	60	NONE	
70LED	Stairway 5	Stairway	5	W 32 C F 1	F41LL	32	0.16	Breaker	3200	512	NONE	
265LED	Stairway 5	Stairway	2	2B 32 C F 2 (ELE)	F22LL	31	0.06	Breaker	3200	198	NONE	
70LED	Room 7	Classrooms	8	W 32 C F 1	F41LL	32	0.26	SW	2400	614	C-OCC	
265LED	Room 7 Restroom	Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.03	SW	4300	133	NONE	
70LED	Room 8	Classrooms	8	W 32 C F 1	F41LL	32	0.26	SW	2400	614	C-OCC	
70LED	Room 5	Classrooms	8	W 32 C F 1	F41LL	32	0.26	SW	2400	614	C-OCC	
70LED	Room 25 ESL	Classrooms	1	W 32 C F 1	F41LL	32	0.03	SW	2400	77	C-OCC	
70LED	Room 3	Classrooms	12	W 32 C F 1	F41LL	32	0.38	SW	2400	922	C-OCC	
70LED	Computer Room	Classrooms	8	W 32 C F 1	F41LL	32	0.26	SW	2400	614	C-OCC	
50LED	Office	Offices	1	W 32 W P 2 (ELE)	F42LL	60	0.06	SW	2400	144	OCC	
50LED	Room 2	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
265LED	Room 2 Restroom	Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.03	SW	4300	133	NONE	
50LED	Room 4	Classrooms	12	W 32 W P 2 (ELE)	F42LL	60	0.72	SW	2400	1,728	C-OCC	
265LED	Room 4 Restroom	Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.03	SW	4300	133	NONE	
93	Closet	Storage Areas	1	I 75	I75/1	75	0.08	SW	1000	75	NONE	
50LED	Room 6	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
70LED	Art Room	Classrooms	1	W 32 C F 1	F41LL	32	0.03	SW	2400	77	NONE	
50LED	Room 9	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 10	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 20	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 19	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 16	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 26	Classrooms	1	W 32 W P 2 (ELE)	F42LL	60	0.06	SW	2400	144	C-OCC	
50LED	Room 14	Classrooms	12	W 32 W P 2 (ELE)	F42LL	60	0.72	SW	2400	1,728	C-OCC	
70LED	Room 14 Hallway	Storage Areas	1	W 32 C F 1	F41LL	32	0.03	SW	1000	32	NONE	
50LED	Room 12	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 12 Restroom	Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.06	SW	4300	258	NONE	
50LED	Library Room 11	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Office	Offices	1	W 32 W P 2 (ELE)	F42LL	60	0.06	SW	2400	144	OCC	
50LED	Room 13	Classrooms	12	W 32 W P 2 (ELE)	F42LL	60	0.72	SW	2400	1,728	C-OCC	
50LED	Testing Room	Classrooms	1	W 32 W P 2 (ELE)	F42LL	60	0.06	SW	2400	144	OCC	
50LED	Room 15	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 18	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 17	Classrooms	8	W 32 W P 2 (ELE)	F42LL	60	0.48	SW	2400	1,152	C-OCC	
50LED	Room 17 Coat Room	Storage Areas	1	W 32 W P 2 (ELE)	F42LL	60	0.06	SW	1000	60	NONE	
70LED	Stairway 1	Stairway	5	W 32 C F 1	F41LL	32	0.16	Breaker	3200	512	NONE	
70LED	Stairway 2	Stairway	5	W 32 C F 1	F41LL	32	0.16	Breaker	3200	512	NONE	
70LED	Stairway 3	Stairway	5	W 32 C F 1	F41LL	32	0.16	Breaker	3200	512	NONE	
70LED	Stairway 4	Stairway	5	W 32 C F 1	F41LL	32	0.16	Breaker	3200	512	NONE	
266LED	Exterior	Outdoor Lighting	2	MV 1000	MV1000/1	1075	2.15	Breaker	4368	9,391	NONE	
	Total		**321**				**18.86**			**50,121**		

APPENDIX C

ECM Calculations

Newark Board of Education - NJBPU
CHA Project #27999

Rate of Discount (used for NPV) 3.0%

Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost	
$ 0.150	$/kWh blended		0.000420205	29,510	Electric	Natural Gas
$ 0.130	$/kWh supply	148,920	0.000420205		22,205	27,455
$ 4.99	$/kW	42.4	0			
$ 0.98	$/Therm	27,911	0.00533471			
$ 7.41	$/kgals	1,080	0			

South St Elementary School

Recommend? Y or N		Item	Savings kW	kWh	therms	Water kgal	$	Cost	Simple Payback	Life Expectancy	Equivalent CO_2 (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings kW	kWh	therms	kgal/yr	$	ROI	NPV	IRR
Y	ECM-1	Replace Door Sweeps and Seals	0.0	0	472	0	463	$ 2,074	4.5	10	2.5	$ -	N	4.5	0.0	0	4,724	0	$ 4,629	1.2	$1,875	18.1%
N	ECM-2	Convert Steam System to Hot Water & Install High Efficiency Condensing Boilers	0.0	0	10,511	0	10,301	$ 960,908	93.3	25	56.1	$ 3,000	N	93.0	0.0	0	262,776	0	$ 257,521	(0.7)	($778,538)	-8.3%
Y	ECM-3	Install Window A/C Controllers	0.0	2,618	0	0	393	$ 600	1.5	15	1.1	$ -	N	1.5	0.0	39,268	0	0	$ 5,890	8.8	$4,088	65.4%
Y	ECM-4A	Install Basic Controls	0.0	0	2,770	0	2,715	$ 21,309	7.8	15	14.8	$ -	N	7.8	0.0	0	41,550	0	$ 40,719	0.9	$11,098	9.5%
N	ECM-4B	Install Full DDC Controls	0.0	0	4,361	0	4,274	$ 250,000	58.5	15	23.3	$ -	N	58.5	0.0	0	65,414	0	$ 64,106	(0.7)	($198,981)	-13.6%
N	ECM-5	Install Low Flow Plumbing Fixtures	0.0	0	0	39	292	$ 52,906	181.2	30	0.0	$ -	N	181.2	0.0	0	0	1,182	$ 8,759	(0.8)	($47,183)	-9.1%
N	ECM-L1	Lighting Replacements / Upgrades	10.4	28,588	0	0	4,339	$ 32,608	7.5	15	12.0	$ 400	N	7.4	156.0	428,820	0	0	$ 73,664	1.3	$19,593	10.4%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	9,938	0	0	1,292	$ 8,586	6.6	15	4.2	$ 1,105	N	5.8	0.0	149,070	0	0	$ 22,361	1.6	$7,942	15.2%
Y	ECM-L3	Lighting Replacements with Controls (Occupany Sensors)	10.4	33,355	0	0	4,959	$ 40,924	8.3	15	14.0	$ 1,505	N	7.9	156.0	500,325	0	0	$ 84,390	1.1	$19,780	9.2%
		Total (Does Not Include ECM-4B, ECM-L1 & ECM-L2)	**10.4**	**35,973**	**13,753**	**39**	**$ 19,122**	**$ 1,078,722**	**56.4**	**18.3**	**88.5**	**$ 4,505**		**56.2**	**156.0**	**539,593**	**309,050**	**1,182**	**$ 401,909**	**(0.6)**	**$ (811,223)**	**-9.9%**
		Recommended Measures (highlighted green above)	**10.4**	**35,973**	**3,242**	**0**	**$ 8,529**	**$ 64,908**	**7.6**	**13.8**	**32.4**	**$ 1,505**		**7.4**	**156.0**	**539,593**	**46,274**	**-**	**$ 135,629**	**1.1**	**$ 27,304**	**9.1%**
		% of Existing	**25%**	**24%**	**12%**	**0%**																

City:	Newark, NJ				
Occupied Hours/Week	80	50	50	50	50
	Building	Auditorium	Gymnasium	Library	Classrooms
	Occupied	Occupied	Occupied	Occupied	Occupied
Temp	Hours	Hours	Hours	Hours	Hours
102.5					
97.5	3	2	2	2	2
92.5	15	9	9	9	9
87.5	62	39	39	39	39
82.5	238	149	149	149	149
77.5	295	185	185	185	185
72.5	316	198	198	198	198
67.5	407	254	254	254	254
62.5	441	276	276	276	276
57.5	286	179	179	179	179
52.5	348	217	217	217	217
47.5	234	146	146	146	146
42.5	312	195	195	195	195
37.5	487	304	304	304	304
32.5	350	218	218	218	218
27.5	159	99	99	99	99
22.5	120	75	75	75	75
17.5	60	37	37	37	37
12.5	22	14	14	14	14
7.5	16	10	10	10	10
2.5	0	0	0	0	0
-2.5					
-7.5					
	8,760				

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

Exist Heating Sys Efficiency	65%
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

Newark Board of Education - NJBPU
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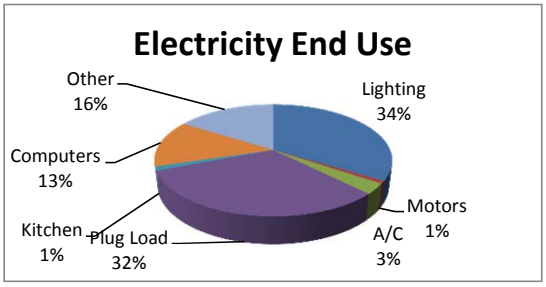
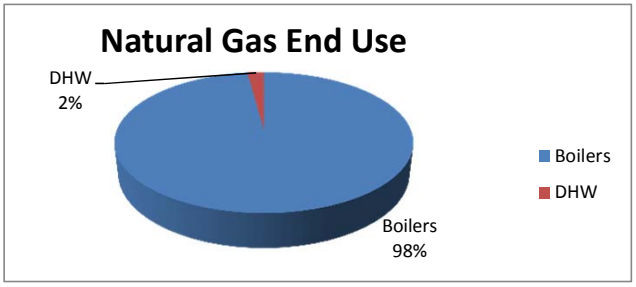
South St Elementary School

Utility End Use Analysis		
Electricity Use (kWh):		**Notes/Comments:**
148,920	Total	Based on utility analysis
50,121	Lighting	From Lighting Calculations
1,160	Motors	Estimated
4,496	A/C	See Window AC Calculation
47,216	Plug Load	Estimated
1,750	Kitchen	Estimated
20,250	Computers	Estimated
23,927	Other	Remaining
Natural Gas Use (Therms):		**Notes/Comments:**
27,911	Total	Based on utility analysis
27,320	Boilers	Therms/SF x Square Feet Served
591	DHW	Based on utility analysis





Newark Board of Education - NJBPU
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South St Elementary School

ECM1: Replace Door Seals and Sweeps

Existing: Lack of seals around doors allows for excessive infiltration
Proposed: Install new door sweeps and seals to minimize infiltration during the heating months

Heating System Efficiency	65%		Ex Occupied Clng Temp.	72	*F	Ex Occupied Htg Temp.	80	*F
Cooling System Efficiency	1.20	kW/ton	Ex Unoccupied Clng Temp.	72	*F	Ex Unoccupied Htg Temp.	80	*F
Linear Feet of Door Edge	120.375	LF	Cooling Occ Enthalpy Setpoint	27.5	Btu/lb	Electricity	$ 0.15	$/kWh
Existing Infiltration Factor*	1.5	cfm/LF	Cooling Unocc Enthalpy Setpoint	27.5	Btu/lb	Natural Gas	$ 0.98	$/therm
Proposed Infiltration Factor*	0.45	cfm/LF						

*Infiltration Factor per Carrier Handbook of Air Conditioning System Design based on average seal gap calculated below.

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy therms	Proposed Heating Energy therms
A		B	C	D	E	F	G	H	I	J	K	L
102.5	0.0	0	0	0	22,345	22,345	6,703	6,703	0	0	0	0
97.5	35.4	6	3	3	-6,425	-6,425	-1,927	-1,927	4	1	0	0
92.5	37.4	31	15	16	-8,046	-8,046	-2,414	-2,414	25	7	0	0
87.5	35.0	131	62	69	-6,082	-6,082	-1,824	-1,824	80	24	0	0
82.5	33.0	500	238	262	-4,507	-4,507	-1,352	-1,352	225	68	0	0
77.5	31.5	620	295	325	-3,289	-3,289	-987	-987	204	61	0	0
72.5	29.9	664	316	348	-1,955	-1,955	-586	-586	130	39	0	0
67.5	27.2	854	407	447	2,438	2,438	731	731	0	0	32	10
62.5	24.0	927	441	486	3,413	3,413	1,024	1,024	0	0	49	15
57.5	20.3	600	286	314	4,388	4,388	1,316	1,316	0	0	41	12
52.5	18.2	730	348	382	5,363	5,363	1,609	1,609	0	0	60	18
47.5	16.0	491	234	257	6,338	6,338	1,901	1,901	0	0	48	14
42.5	14.5	656	312	344	7,313	7,313	2,194	2,194	0	0	74	22
37.5	12.5	1,023	487	536	8,288	8,288	2,486	2,486	0	0	130	39
32.5	10.5	734	350	384	9,263	9,263	2,779	2,779	0	0	105	31
27.5	8.7	334	159	175	10,238	10,238	3,071	3,071	0	0	53	16
22.5	7.0	252	120	132	11,213	11,213	3,364	3,364	0	0	43	13
17.5	5.4	125	60	65	12,188	12,188	3,656	3,656	0	0	23	7
12.5	3.7	47	22	25	13,163	13,163	3,949	3,949	0	0	10	3
7.5	2.1	34	16	18	14,138	14,138	4,241	4,241	0	0	7	2
2.5	1.3	1	0	1	15,113	15,113	4,534	4,534	0	0	0	0
-2.5	0.0	0	0	0					0	0	0	0
TOTALS		**8,760**	**4,171**	**4,589**					**668**	**200**	**675**	**202**

Existing Door Infiltration	**181**	**cfm**
Existing Unoccupied Door Infiltration	**181**	**cfm**
Proposed Door Infiltration	**54**	**cfm**
Proposed Unoccupied Door Infiltration	**54**	**cfm**

Savings	**472**	**therms**	**$ 463**
	467	**kWh**	**$ 70**
			$ 533

Door ID	Width (ft)	Height (ft)	Linear Feet (LF)	gap (in)	# Sides with Gap	LF of gap	% Door w/ gap	Average gap for Door (in)
Main Left	3	7	20	0.125	3	13.4	67%	0.084
Main Right	3	7	20	0.125	3	13.4	67%	0.084
North Stair Left	3	7	20	0.125	3	13.4	67%	0.084
North Stair Right	3	7	20	0.125	3	13.4	67%	0.084
South Stair	3	7	20	0.125	3	13.4	67%	0.084
East Stair Right	3	7	20	0.125	3	13.4	67%	0.084
West Stair Left	3	7	20	0.125	3	13.4	67%	0.084
West Stair Right	3	7	20	0.125	3	13.4	67%	0.084
Parking Lot Exit	3	7	20	0.125	3	13.4	67%	0.084
Total	**27**	**63**	**180**	**0.125**		**120.4**	**67%**	**0.084**

Note: Doors labeled 'a', 'b', etc. are a part of the same door assembly.

Newark Board of Education - NJBPU
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ECM1: Replace Door Seals and Sweeps - 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.		
									$ -	
Door Weatherization Seals & Sweeps	9	EA	$ 40	$ 115	$ -	$ 370	$ 1,290	$ -	$ 1,659	RS Means
						$ -	$ -	$ -	$ -	

$ 1,659	Subtotal
$ 415	25% Contingency
$ 2,074	**Total**

Newark Board of Education - NJBPU
CHA Project #27999
South St Elementary School

ECM-2: Convert Steam System to Hot Water & Install High Efficiency Condensing Boilers
Steam to hot water. DOES NOT INCLUDE VENTILATION PENALTY

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 0.98	/ Therm	
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	1,982,861	btu/hr	Estimated basd on utility consumption & equivalent full load hours of boiler
Boiler Combustion Efficiency	80%		NJ Protocols
Heating Degree-Day	2,783	Degree-day	
Design Temperature Difference	14	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	1,982,861	btu/hr	
Boiler Combustion Efficiency	90%		
SAVINGS			
Fuel Savings	10,511	Therms	
Fuel Cost Savings	$ 10,301		

Building Type
Education
Food Sales
Food Service
Health Care
Lodging
Retail
Office
Public Assembly
Public Order/Safety
Religious Worship
Service
Warehouse/Storage

Outdo
Weather Station
Atlantic City
Newark
Philadelphia
Monticello, NY

If boiler capacity is unknown:

27,911	Therms/yr
731,289	btu/hr
731	MBH

3348
2008.8

Algorithms

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

Definition of Variables

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

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

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

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

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

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

EFF_B = Efficiency of baseline heaters (AFUE %)

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

Furnaces and Boilers

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

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

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

Newark Board of Education - NJBPU
CHA Project #27999
South St Elementary School

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-2: Convert Steam System to Hot Water & Install High Efficiency

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
1500 MBH NG Condensing Boiler	2	EA	$ 27,500	$ 5,300		$ 56,485	$ 13,208	$ -	$ 69,693	
Flue Installation	2	EA	$ 5,000.0	$ 2,500.00		$ 10,270	$ 6,230	$ -	$ 16,500	
New Unit Vents	24	EA	$ 7,500.0	$ 5,000.00		$ 184,860	$ 149,520	$ -	$ 334,380	
HW piping	1	LS	$ 150,000	$ 100,000		$ 154,050	$ 124,600	$ -	$ 278,650	
Electrical	24	EA	$ 1,000	$ 1,500		$ 24,648	$ 44,856	$ -	$ 69,504	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

Note: Cost estimates are for energy calulation purposes only - Do not use for procurement

$	768,727	Subtotal
$	192,182	25% Contingency
$	**960,908**	**Total**

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EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (btu/h)
AC-1	Teachers Lounge	12,000
AC-2	Library	12,000
AC-3	Main Office	12,000
	Total Electric DX Cooling:	*36,000* *btu/h*

ECM-3: Install Window A/C Controller

ECM Description Summary
Window A/Cs are not programmable and run the risk of operating when no occupants are present. A plug-in window A/C controller will turn off the A/C when no occupants are detected.

ASSUMPTIONS			Comments
Electric Cost	$0.150	/ kWh	
Average run hours per Week	80	Hours	
Space Balance Point	55	F	
Space Temperature Setpoint	65	deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	36,000	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	10.7		
Existing Annual Electric Usage	4,496	kWh	

Item	Value	Units	Comments
Proposed EER	10.7		
Proposed Annual Electric Usage	1,878	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Electrical Usage Savings	2,618	kWh
Annual Cost Savings	$393	
Total Project Cost	$600	
Simple Payback	2	years

OAT - DB Bin Temp F	Annual Hours	Existing Hours of Operation	Proposed % of time of operation	Proposed hrs of Operation
102.5	0	0	100%	0
97.5	6	3	89%	3
92.5	31	15	79%	12
87.5	131	62	68%	43
82.5	500	238	58%	138
77.5	620	295	47%	140
72.5	664	316	37%	116
67.5	854	407	26%	107
62.5	927	0	0%	0
57.5	600	0	0%	0
52.5	730	0	0%	0
47.5	491	0	0%	0
42.5	656	0	0%	0
37.5	1,023	0	0%	0
32.5	734	0	0%	0
27.5	334	0	0%	0
22.5	252	0	0%	0
17.5	125	0	0%	0
12.5	47	0	0%	0
7.5	34	0	0%	0
2.5	1	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0
Total	8,760	1,336	42%	558

Newark Board of Education - NJBPU
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ECM-3: Install Window A/C Controller - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Window AC Controller	3	EA	$ 150	$ -	$ -	$ 462	$ -	$ -	$ 462	Est wireless A/C controller
						$ -	$ -	$ -	$ -	

$	462	Subtotal
$	116	25% Contingency
$	**600**	**Total**

Newark Board of Education - NJBPU
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South St Elementary School

ECM-4A: Install Basic Controls

EXISTING CONDITIONS			
Heating			
Heating Season Facility Temp	80	F	Th
Weekly Occupied Hours	50	hrs	H
Heating Season Setback Temp	75	F	Sh
Heating Season % Savings per	3%		Ph
Annual Boiler Capacity	1,784,575	Mbtu/yr	
Connected Heating Load	1,982,861	Btu/hr	Caph
Equivalent Full Load Heating	900	hrs	EFLHh
Heating System Efficiency	65%		AFUEh
Cooling			
Cooling Season Facility Temp		F	Tc
Weekly Occupied Hours		hrs	H
Cooling Season Setback Temp		F	Sc
Cooling Season % Savings per			Pc
Connected Cooling Load		Tons	Capc
Equivalent Full Load Cooling		hrs	EFLHc
Cooling Equipment EER	-		AFUEc
	No Significant Cooling		
SAVINGS			
Natural Gas Savings	2,770	Therms	
Cooling Electricity Savings	0	kWh	
Total Cost Savings	$ 2,715		
Estimated Total Project Cost	$ 21,309		
Simple Payback	7.8	**years**	

Based on the utility usage

Algorithms

Cooling Energy Savings (kWh) = (((Tc*(H+5)+Sc*(168-(H+5)))/168) Tc)*(Pc*Caphp*12*EFLHc/EERhp)

Heating Energy Savings (kWh) = (((Th*(H+5)+Sh*(168-(H+5)))/168)- Th)*(Ph*Caphp*12*EFLHh/EERhp)

Heating Energy Savings (Therms) = (Th-(Th*(H+5)+Sh*(168-(H+5)))/168)*(Ph*Caph*EFLHh/AFUEh/100,000)

Definition of Variables

T_h = Heating Season Facility Temp. (°F)
T_c = Cooling Season Facility Temp. (°F)
S_h = Heating Season Setback Temp. (°F)
S_c = Cooling Season Setup Temp. (°F)
H = Weekly Occupied Hours
Cap_{hp} = Connected load capacity of heat pump/AC (Tons) – Provided on Application.
Cap_h = Connected heating load capacity (Btu/hr) – Provided on Application.
$EFLH_c$ = Equivalent full load cooling hours
$EFLH_h$ = Equivalent full load heating hours
P_h = Heating season percent savings per degree setback
P_c = Cooling season percent savings per degree setup
$AFUE_h$ = Heating equipment efficiency – Provided on Application.
EER_{hp} = Heat pump/AC equipment efficiency – Provided on Application

Occupancy Controlled Thermostats

Component	Type	Value	Source
T_h	Variable		Application
T_c	Variable		Application
S_h	Fixed	T_h-5°	
S_c	Fixed	T_c+5°	
H	Variable		Application; Default of 56 hrs/week
Cap_{hp}	Variable		Application
Cap_h	Variable		Application
$EFLH_c$	Fixed	381	1
$EFLH_h$	Fixed	900	PSE&G
P_h	Fixed	3%	2
P_c	Fixed	6%	2
$AFUE_h$	Variable		Application
EER_{hp}	Variable		Application

Sources:
1. JCP&L metered data from 1995-1999
2. ENERGY STAR Products website

Newark Board of Education - NJBPU
CHA Project #27999
South St Elementary School

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-4A: Install Basic Controls - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Night Setback Controls	1	ea	$ 7,500	$ 7,500		$ 7,703	$ 9,345	$ -	$ 17,048	Estimated
						$ -	$ -	$ -	$ -	

$ 17,048	Subtotal
$ 4,262	25% Contingency
$ 21,309	**Total**

Newark Board of Education - NJBPU
CHA Project #27999
South St Elementary School

ECM-4B: Install Full DDC Controls

Summary: Presently boilers operate in manual mode. The proposed case involves installing full DDC controls to include morning warm-up, individual space regulation, temperature setback while unoccupied and scheduling

Building Information:

29,510	Sq Footage	$0.15	$/kWh Blended
N	Cooling	$0.98	$/Therm
Y	Heating		

FULL DDC - TEMPERATURE SETBACK SAVINGS CALCULATION

EXISTING CONDITIONS		
Heating		
Heating Season Facility Temp	80	F
Weekly Occupied Hours	50	hrs
Heating Season Setback Temp	75	F
Heating Season % Savings per Degree Setback	3%	
Annual Boiler Capacity	1,784,575	Mbtu/yr
Connected Heating Load Capacity	1,982,861	Btu/hr
Equivalent Full Load Heating Hours	900	hrs
Heating System Efficiency	65%	
Cooling		
Cooling Season Facility Temp		F
Weekly Occupied Hours		hrs
Cooling Season Setback Temp		F
Cooling Season % Savings per Degree Setback		
Connected Cooling Load Capacity		Tons
Equivalent Full Load Cooling Hours		hrs
Cooling Equipment EER	-	
	No Significant Cooling	
SAVINGS		
Natural Gas Savings	2,770	Therms
Cooling Electricity Savings	0	kWh
Total Cost Savings	$ 2,715	
Estimated Total Project Cost	$ 21,309	

FULL DDC - ADDITIONAL CONTROLS SAVINGS CALCULATION

EXISTING CONDITIONS		
Existing Facility Total Electric usage	148,920	kWh
Existing Facility Total Gas usage	27,911	Therms
Existing Facility Cooling Electric usage	-	kWh[1]
Existing Facility Heating Natural Gas usage	26,515	Therms[2]
PROPOSED CONDITIONS		
Proposed Facility Cooling Electric Savings	0	kWh
Proposed Facility Natural Gas Savings	1,591	Therms
SAVINGS		
Electric Savings	0	**kWh**
Natural Gas Savings	1,591	**Therms**
Total cost savings	$ 1,559	
Estimated Total Project Cost	$ 250,000	[4]

Assumptions

1 0% of facility total electricity dedicated to Cooling; based on utility information
2 95% of facility total natural gas dedicated to Heating; based on utility information
3 6% Typical Savings associated with installation of DDC controls
4 $250,000 Based on wireless DDC cost

COMBINED SAVINGS		
Natural Gas Savings	4,361	Therms
Cooling Electricity Savings	0	kWh
Total Cost Savings	$ 4,274	
Estimated Total Project Cost	$271,309	
Simple Payback	63.5	Yrs

Newark Board of Education - NJBPU
CHA Project #27999
South St Elementary School

ECM-5: Install Low Flow Plumbing Fixtures (Urinals)

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$7.41	$ / kGal
Urinals in Building to be replaced	3	
Average Flushes / Urinal (per Day)	3	
Average Gallons / Flush	2.5	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	3	
Proposed Gallons / Flush	0.125	Gal

SAVINGS		
Current Urinal Water Use	8.21	kGal / year
Proposed Urinal Water Use	0.41	kGal / year
Water Savings	7.80	kGal / year
Cost Savings	$58	/ year

Newark Board of Education - NJBPU
CHA Project #27999
South St Elementary School

ECM-5: Install Low Flow Plumbing Fixtures (Toilets)

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$7.41	$ / kGal
Toilets in Building	13	
Average Flushes / Toilet (per Day)	3	
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	13	
Proposed Gallons / Flush	1.28	Gal

SAVINGS		
Current Toilet Water Use	49.82	kGal / year
Proposed Toilet Water Use	18.22	kGal / year
Water Savings	31.60	kGal / year
Cost Savings	$234	/ year

Newark Board of Education - NJBPU
CHA Project #27999
South St Elementary School

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

Replace Plumbing Fixtures with Low-Flow Equivalents - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									$ -	
Low-Flow Urinal	3	EA	$ 1,200	$ 1,000	$ -	$ 3,697	$ 3,738	$ -	$ 7,435	RS Means 2012
Low-Flow Toilet	13	EA	$ 1,400	$ 1,000	$ -	$ 18,691	$ 16,198	$ -	$ 34,889	RS Means 2012
						$ -	$ -	$ -	$ -	

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

$ 42,325	Subtotal
$ 10,581	25% Contingency
$ 52,906	**Total**

Newark Board of Education - NJBPU
CHA Project #27999
South St Elementary School

New Jersey Pay For Performance Incentive Program

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

Values used in this calculation are for ALL identified measures, regardless of payback or IRR. P4P estimated incentives represent a best case scenario, and will likely be lower depending on which measures are included. The savings displayed here are not guaranteed to qualify for P4P incentives if IRR or payback requirements are not met.

Total Building Area (Square Feet)	29,510
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilites (BPU)

Incentive #1		
Audit is funded by NJ BPU	$0.10	$/sqft

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$22,205	$27,455
Existing Usage (from utility)	148,920	27,911
Proposed Savings	35,973	13,753
Existing Total MMBtus	3,299	
Proposed Savings MMBtus	1,498	
% Energy Reduction	**45.4%**	
Proposed Annual Savings	$8,529	

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

	Incentives $		
	Elec	Gas	Total
Incentive #1	$0	$0	$5,000
Incentive #2	$3,957	$17,192	$21,149
Incentive #3	$3,957	$17,192	$21,149
Total All Incentives	**$7,914**	**$34,384**	**$47,298**

Total Project Cost	$64,908

		Allowable Incentive
% Incentives #1 of Utility Cost*	10.1%	$5,000
% Incentives #2 of Project Cost**	32.6%	$16,227
% Incentives #3 of Project Cost**	32.6%	$16,227
Total Eligible Incentives***	**$37,454**	
Project Cost w/ Incentives	$27,454	

Project Payback (years)	
w/o Incentives	w/ Incentives
7.6	3.2

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

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

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

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

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

Energy Audit of Newark Public Schools - South Street School
CHA Project No.27999
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
218LED	Boiler Room	6	W 32 C F 3 (ELE)	F43ILL/2	90	0.5	SW	1600	864	6	4 ft LED Tube	200732x3	45	0.3	SW	1,600	432	432	0.3	$ 72.33	$ 1,306.80	$0	18.1	18.1
50LED	Custodial Room	2	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	4 ft LED Tube	200732x2	30	0.1	SW	2,400	144	144	0.1	$ 22.31	$ 290.40	$0	13.0	13.0
265LED	Custodial Room	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	2400	74	1	2T 46 R LED	2RTLED	25	0.0	SW	2,400	60	14	0.0	$ 2.23	$ -	$0	0.0	0.0
265LED	Boiler Room Stairway	2	2B 32 C F 2 (ELE)	F22LL	31	0.1	SW	1600	99	2	2T 46 R LED	2RTLED	25	0.1	SW	1,600	80	19	0.0	$ 3.21	$ -	$0	0.0	0.0
265LED	Janitor Closet	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	1000	31	1	2T 46 R LED	2RTLED	25	0.0	SW	1,000	25	6	0.0	$ 1.14	$ -	$0	0.0	0.0
70LED	Main Entrance	3	W 32 C F 1	F41LL	32	0.1	SW	3876	372	3	4 ft LED Tube	200732x1	15	0.0	SW	3,876	174	198	0.1	$ 28.75	$ 217.80	$0	7.6	7.6
50LED	Main Office	9	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,296	9	4 ft LED Tube	200732x2	30	0.3	SW	2,400	648	648	0.3	$ 100.41	$ 1,306.80	$0	13.0	13.0
18LED	Teacher's Lounge	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075	4	T 74 R LED	RTLED50	50	0.2	SW	2,400	480	595	0.2	$ 92.23	$ -	$0	0.0	0.0
70LED	Gymnasium	16	W 32 C F 1	F41LL	32	0.5	SW	2000	1,024	16	4 ft LED Tube	200732x1	15	0.2	SW	2,000	480	544	0.3	$ 87.01	$ 1,161.60	$0	13.4	13.4
70LED	Cafeteria	16	W 32 C F 1	F41LL	32	0.5	SW	2000	1,024	16	4 ft LED Tube	200732x1	15	0.2	SW	2,000	480	544	0.3	$ 87.01	$ 1,161.60	$0	13.4	13.4
70LED	Kitchen	6	W 32 C F 1	F41LL	32	0.2	SW	2000	384	6	4 ft LED Tube	200732x1	15	0.1	SW	2,000	180	204	0.1	$ 32.63	$ 435.60	$0	13.4	13.4
70LED	Kitchen Corridor	2	W 32 C F 1	F41LL	32	0.1	SW	2000	128	2	4 ft LED Tube	200732x1	15	0.0	SW	2,000	60	68	0.0	$ 10.88	$ 145.20	$0	13.4	13.4
70LED	Kitchen Office	1	W 32 C F 1	F41LL	32	0.0	SW	2000	64	1	4 ft LED Tube	200732x1	15	0.0	SW	2,000	30	34	0.0	$ 5.44	$ 72.60	$0	13.4	13.4
70LED	Kitchen Office	1	W 32 C F 1	F41LL	32	0.0	SW	2000	64	1	4 ft LED Tube	200732x1	15	0.0	SW	2,000	30	34	0.0	$ 5.44	$ 72.60	$0	13.4	13.4
70LED	Boys Restroom	4	W 32 C F 1	F41LL	32	0.1	SW	4300	550	4	4 ft LED Tube	200732x1	15	0.1	SW	4,300	258	292	0.1	$ 42.08	$ 290.40	$0	6.9	6.9
70LED	Girls Restroom	4	W 32 C F 1	F41LL	32	0.1	SW	4300	550	4	4 ft LED Tube	200732x1	15	0.1	SW	4,300	258	292	0.1	$ 42.08	$ 290.40	$0	6.9	6.9
121LED	Office	4	W 34 P F 4	F44EE	144	0.6	SW	2400	1,382	4	T 74 R LED	RTLED50	50	0.2	SW	2,400	480	902	0.4	$ 139.83	$ -	$0	0.0	0.0
18LED	Nurse's Office	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2400	2,419	9	T 74 R LED	RTLED50	50	0.5	SW	2,400	1,080	1,339	0.6	$ 207.51	$ -	$0	0.0	0.0
265LED	Nurse's Office Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	SW	4,300	108	26	0.0	$ 3.71	$ -	$0	0.0	0.0
50LED	Vice Principal	2	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	4 ft LED Tube	200732x2	30	0.1	SW	2,400	144	144	0.1	$ 22.31	$ 290.40	$0	13.0	13.0
18LED	Principal - 26	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075	4	T 74 R LED	RTLED50	50	0.2	SW	2,400	480	595	0.2	$ 92.23	$ -	$0	0.0	0.0
265LED	Men's Walkway	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	SW	4,300	108	26	0.0	$ 3.71	$ -	$0	0.0	0.0
50LED	Men's Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258	1	4 ft LED Tube	200732x2	30	0.0	SW	4,300	129	129	0.0	$ 18.57	$ 145.20	$0	7.8	7.8
265LED	Women's Walkway	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	SW	4,300	108	26	0.0	$ 3.71	$ -	$0	0.0	0.0
50LED	Women's Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258	1	4 ft LED Tube	200732x2	30	0.0	SW	4,300	129	129	0.0	$ 18.57	$ 145.20	$0	7.8	7.8
71	Storage	1	I 60	I60/1	60	0.1	SW	1000	60	1	CF 26	CFQ26/1-L	27	0.0	SW	1,000	27	33	0.0	$ 6.27	$ 6.00	$0	1.0	1.0
70LED	Stairway 5	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	Breaker	3,200	240	272	0.1	$ 40.45	$ 363.00	$0	9.0	9.0
265LED	Stairway 5	2	2B 32 C F 2 (ELE)	F22LL	31	0.1	Breaker	3200	198	2	2T 46 R LED	2RTLED	25	0.1	Breaker	3,200	160	38	0.0	$ 5.71	$ -	$0	0.0	0.0
70LED	Room 7	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614	8	4 ft LED Tube	200732x1	15	0.1	SW	2,400	288	326	0.1	$ 50.58	$ 580.80	$0	11.5	11.5
265LED	Room 7 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	SW	4,300	108	26	0.0	$ 3.71	$ -	$0	0.0	0.0
70LED	Room 8	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614	8	4 ft LED Tube	200732x1	15	0.1	SW	2,400	288	326	0.1	$ 50.58	$ 580.80	$0	11.5	11.5
70LED	Room 5	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614	8	4 ft LED Tube	200732x1	15	0.1	SW	2,400	288	326	0.1	$ 50.58	$ 580.80	$0	11.5	11.5
70LED	Room 25 ESL	1	W 32 C F 1	F41LL	32	0.0	SW	2400	77	1	4 ft LED Tube	200732x1	15	0.0	SW	2,400	36	41	0.0	$ 6.32	$ 72.60	$0	11.5	11.5
70LED	Room 3	12	W 32 C F 1	F41LL	32	0.4	SW	2400	922	12	4 ft LED Tube	200732x1	15	0.2	SW	2,400	432	490	0.2	$ 75.86	$ 871.20	$0	11.5	11.5
70LED	Computer Room	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614	8	4 ft LED Tube	200732x1	15	0.1	SW	2,400	288	326	0.1	$ 50.58	$ 580.80	$0	11.5	11.5
50LED	Office	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	4 ft LED Tube	200732x2	30	0.0	SW	2,400	72	72	0.0	$ 11.16	$ 145.20	$0	13.0	13.0
50LED	Room 2	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
265LED	Room 2 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	SW	4,300	108	26	0.0	$ 3.71	$ -	$0	0.0	0.0
50LED	Room 4	12	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	4 ft LED Tube	200732x2	30	0.4	SW	2,400	864	864	0.4	$ 133.88	$ 1,742.40	$0	13.0	13.0
265LED	Room 4 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	SW	4,300	108	26	0.0	$ 3.71	$ -	$0	0.0	0.0
93	Closet	1	I 75/1	I75/1	75	0.1	SW	1000	75	1	CF 26	CFQ26/1-L	27	0.0	SW	1,000	27	48	0.0	$ 9.11	$ 4.80	$0	0.5	0.5
50LED	Room 6	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
70LED	Art Room	1	W 32 C F 1	F41LL	32	0.0	SW	2400	77	1	4 ft LED Tube	200732x1	15	0.0	SW	2,400	36	41	0.0	$ 6.32	$ 72.60	$0	11.5	11.5
50LED	Room 9	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 10	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 20	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 19	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 16	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 26	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	4 ft LED Tube	200732x2	30	0.0	SW	2,400	72	72	0.0	$ 11.16	$ 145.20	$0	13.0	13.0
50LED	Room 14	12	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	4 ft LED Tube	200732x2	30	0.4	SW	2,400	864	864	0.4	$ 133.88	$ 1,742.40	$0	13.0	13.0
70LED	Room 14 Hallway	1	W 32 C F 1	F41LL	32	0.0	SW	1000	32	1	4 ft LED Tube	200732x1	15	0.0	SW	1,000	15	17	0.0	$ 3.23	$ 72.60	$0	22.5	22.5
50LED	Room 12	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 12 Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258	1	4 ft LED Tube	200732x2	30	0.0	SW	4,300	129	129	0.0	$ 18.57	$ 145.20	$0	7.8	7.8
50LED	Library Room 11	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Office	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	4 ft LED Tube	200732x2	30	0.0	SW	2,400	72	72	0.0	$ 11.16	$ 145.20	$0	13.0	13.0
50LED	Room 13	12	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	4 ft LED Tube	200732x2	30	0.4	SW	2,400	864	864	0.4	$ 133.88	$ 1,742.40	$0	13.0	13.0
50LED	Testing Room	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	4 ft LED Tube	200732x2	30	0.0	SW	2,400	72	72	0.0	$ 11.16	$ 145.20	$0	13.0	13.0
50LED	Room 15	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 18	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 17	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	SW	2,400	576	576	0.2	$ 89.25	$ 1,161.60	$0	13.0	13.0
50LED	Room 17 Coat Room	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	1000	60	1	4 ft LED Tube	200732x2	30	0.0	SW	1,000	30	30	0.0	$ 5.70	$ 145.20	$0	25.5	25.5
70LED	Stairway 1	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	Breaker	3,200	240	272	0.1	$ 40.45	$ 363.00	$0	9.0	9.0
70LED	Stairway 2	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	Breaker	3,200	240	272	0.1	$ 40.45	$ 363.00	$0	9.0	9.0
70LED	Stairway 3	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	Breaker	3,200	240	272	0.1	$ 40.45	$ 363.00	$0	9.0	9.0
70LED	Stairway 4	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	Breaker	3,200	240	272	0.1	$ 40.45	$ 363.00	$0	9.0	9.0
266LED	Exterior	2	MV 1000	MV1000/1	1075	2.2	Breaker	4368	9,391	2	WPLED2T156	WPLED2T156	182	0.4	Breaker	4,368	1,590	7,801	1.8	$ 1,121.11	$ -	$400	0.0	-0.4
	Total	**321**				**18.9**			**50,121**	**321**			**1,841**	**8.5**				**21,532**	**28,588**	**10.4**	**$4,336**	**$32,608**	**$400**		
																		Demand Savings			**10.4**	**$620**			
																		kWh Savings			**28,588**	**$3,716**			
																		Total savings				**$4,336**		**7.5**	**7.4**

Energy Audit of Newark Public Schools - South Street School
CHA Project No.27999
ECM-L2 Install Occupancy Sensors

		EXISTING CONDITIONS							RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kW Saved) * ($/kWh)	Cost for renovations to lighting system	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
218LED	Boiler Room	6	W 32 C F 3 (ELE)	F43ILL/2	90	0.5	SW	1600	864.0	6	W 32 C F 3 (ELE)	F43ILL/2	90	0.5	NONE	1600	864.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Custodial Room	2	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	W 32 W P 2 (ELE)	F42LL	60	0.1	NONE	2400	288.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
265LED	Custodial Room	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	2400	74.4	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	NONE	2400	74.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
265LED	Boiler Room Stairway	2	2B 32 C F 2 (ELE)	F22LL	31	0.1	SW	1600	99.2	2	2B 32 C F 2 (ELE)	F22LL	31	0.1	NONE	1600	99.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
265LED	Janitor Closet	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	1000	31.0	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	NONE	1000	31.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Main Entrance	3	W 32 C F 1	F41LL	32	0.1	SW	3876	372.1	3	W 32 C F 1	F41LL	32	0.1	NONE	3876	372.1	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Main Office	9	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,296.0	9	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1200	648.0	648.0	0.0	$84.24	$270.00	$35.00	3.2	2.8
18LED	Teacher's Lounge	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075.2	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1800	806.4	268.8	0.0	$34.94	$270.00	$35.00	7.7	6.7
70LED	Gymnasium	16	W 32 C F 1	F41LL	32	0.5	SW	2000	1,024.0	16	W 32 C F 1	F41LL	32	0.5	NONE	2000	1,024.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Cafeteria	16	W 32 C F 1	F41LL	32	0.5	SW	2000	1,024.0	16	W 32 C F 1	F41LL	32	0.5	C-OCC	1400	716.8	307.2	0.0	$39.94	$270.00	$35.00	6.8	5.9
70LED	Kitchen	6	W 32 C F 1	F41LL	32	0.2	SW	2000	384.0	6	W 32 C F 1	F41LL	32	0.2	NONE	2000	384.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Kitchen Corridor	2	W 32 C F 1	F41LL	32	0.1	SW	2000	128.0	2	W 32 C F 1	F41LL	32	0.1	NONE	2000	128.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Kitchen Office	1	W 32 C F 1	F41LL	32	0.0	SW	2000	64.0	1	W 32 C F 1	F41LL	32	0.0	OCC	1400	44.8	19.2	0.0	$2.50	$128.25	$20.00	51.4	43.4
70LED	Kitchen Office	1	W 32 C F 1	F41LL	32	0.0	SW	2000	64.0	1	W 32 C F 1	F41LL	32	0.0	OCC	1400	44.8	19.2	0.0	$2.50	$128.25	$20.00	51.4	43.4
70LED	Boys Restroom	4	W 32 C F 1	F41LL	32	0.1	SW	4300	550.4	4	W 32 C F 1	F41LL	32	0.1	C-OCC	3000	384.0	166.4	0.0	$21.63	$270.00	$35.00	12.5	10.9
70LED	Girls Restroom	4	W 32 C F 1	F41LL	32	0.1	SW	4300	550.4	4	W 32 C F 1	F41LL	32	0.1	C-OCC	3000	384.0	166.4	0.0	$21.63	$270.00	$35.00	12.5	10.9
121LED	Office	4	W 34 P F 4	F44EE	144	0.6	SW	2400	1,382.4	4	W 34 P F 4	F44EE	144	0.6	OCC	1200	691.2	691.2	0.0	$89.86	$128.25	$20.00	1.4	1.2
18LED	Nurse's Office	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2400	2,419.2	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	NONE	2400	2,419.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
265LED	Nurse's Office Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133.3	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	NONE	4300	133.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Vice Principal	2	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	288.0	2	W 32 W P 2 (ELE)	F42LL	60	0.1	C-OCC	1200	144.0	144.0	0.0	$18.72	$128.25	$20.00	6.9	5.8
18LED	Principal - 26	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075.2	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	OCC	1200	537.6	537.6	0.0	$69.89	$128.25	$20.00	1.8	1.5
265LED	Men's Walkway	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133.3	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	NONE	4300	133.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Men's Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258.0	1	W 32 W P 2 (ELE)	F42LL	60	0.1	NONE	4300	258.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
265LED	Women's Walkway	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133.3	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	NONE	4300	133.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Women's Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258.0	1	W 32 W P 2 (ELE)	F42LL	60	0.1	NONE	4300	258.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
71	Storage	1	I 60	I60/1	60	0.1	SW	1000	60.0	1	I 60	I60/1	60	0.1	NONE	1000	60.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Stairway 5	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512.0	5	W 32 C F 1	F41LL	32	0.2	NONE	3200	512.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
265LED	Stairway 5	2	2B 32 C F 2 (ELE)	F22LL	31	0.1	Breaker	3200	198.4	2	2B 32 C F 2 (ELE)	F22LL	31	0.1	NONE	3200	198.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Room 7	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614.4	8	W 32 C F 1	F41LL	32	0.3	C-OCC	1680	430.1	184.3	0.0	$23.96	$270.00	$35.00	11.3	9.8
265LED	Room 7 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133.3	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	NONE	4300	133.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Room 8	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614.4	8	W 32 C F 1	F41LL	32	0.3	C-OCC	1680	430.1	184.3	0.0	$23.96	$270.00	$35.00	11.3	9.8
70LED	Room 5	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614.4	8	W 32 C F 1	F41LL	32	0.3	C-OCC	1680	430.1	184.3	0.0	$23.96	$270.00	$35.00	11.3	9.8
70LED	Room 25 ESL	1	W 32 C F 1	F41LL	32	0.0	SW	2400	76.8	1	W 32 C F 1	F41LL	32	0.0	C-OCC	1680	53.8	23.0	0.0	$3.00	$270.00	$35.00	90.1	78.5
70LED	Room 3	12	W 32 C F 1	F41LL	32	0.4	SW	2400	921.6	12	W 32 C F 1	F41LL	32	0.4	C-OCC	1680	645.1	276.5	0.0	$35.94	$270.00	$35.00	7.5	6.5
70LED	Computer Room	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614.4	8	W 32 C F 1	F41LL	32	0.3	C-OCC	1680	430.1	184.3	0.0	$23.96	$270.00	$35.00	11.3	9.8
50LED	Office	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144.0	1	W 32 W P 2 (ELE)	F42LL	60	0.1	OCC	1200	72.0	72.0	0.0	$9.36	$128.25	$20.00	13.7	11.6
50LED	Room 2	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
265LED	Room 2 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133.3	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	NONE	4300	133.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Room 4	12	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	W 32 W P 2 (ELE)	F42LL	60	0.7	C-OCC	1680	1,209.6	518.4	0.0	$67.39	$270.00	$35.00	4.0	3.5
265LED	Room 4 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133.3	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	NONE	4300	133.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
93	Closet	1	I 75	I75/1	75	0.1	SW	1000	75.0	1	I 75	I75/1	75	0.1	NONE	1000	75.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Room 6	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
70LED	Art Room	1	W 32 C F 1	F41LL	32	0.0	SW	2400	76.8	1	W 32 C F 1	F41LL	32	0.0	NONE	2400	76.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Room 9	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 10	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 20	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 19	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 16	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 26	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144.0	1	W 32 W P 2 (ELE)	F42LL	60	0.1	C-OCC	1680	100.8	43.2	0.0	$5.62	$270.00	$35.00	48.1	41.8
50LED	Room 14	12	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	W 32 W P 2 (ELE)	F42LL	60	0.7	C-OCC	1680	1,209.6	518.4	0.0	$67.39	$270.00	$35.00	4.0	3.5
70LED	Room 14 Hallway	1	W 32 C F 1	F41LL	32	0.0	SW	1000	32.0	1	W 32 C F 1	F41LL	32	0.0	NONE	1000	32.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Room 12	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 12 Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258.0	1	W 32 W P 2 (ELE)	F42LL	60	0.1	NONE	4300	258.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
50LED	Library Room 11	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Office	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144.0	1	W 32 W P 2 (ELE)	F42LL	60	0.1	OCC	1200	72.0	72.0	0.0	$9.36	$128.25	$20.00	13.7	11.6
50LED	Room 13	12	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728.0	12	W 32 W P 2 (ELE)	F42LL	60	0.7	C-OCC	1680	1,209.6	518.4	0.0	$67.39	$270.00	$35.00	4.0	3.5
50LED	Testing Room	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144.0	1	W 32 W P 2 (ELE)	F42LL	60	0.1	OCC	1680	100.8	43.2	0.0	$5.62	$128.25	$20.00	22.8	19.3
50LED	Room 15	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 18	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 17	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152.0	8	W 32 W P 2 (ELE)	F42LL	60	0.5	C-OCC	1680	806.4	345.6	0.0	$44.93	$270.00	$35.00	6.0	5.2
50LED	Room 17 Coat Room	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	1000	60.0	1	W 32 W P 2 (ELE)	F42LL	60	0.1	NONE	1000	60.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Stairway 1	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512.0	5	W 32 C F 1	F41LL	32	0.2	NONE	3200	512.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Stairway 2	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512.0	5	W 32 C F 1	F41LL	32	0.2	NONE	3200	512.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Stairway 3	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512.0	5	W 32 C F 1	F41LL	32	0.2	NONE	3200	512.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
70LED	Stairway 4	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512.0	5	W 32 C F 1	F41LL	32	0.2	NONE	3200	512.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
266LED	Exterior	2	MV 1000	MV1000/1	1075	2.2	Breaker	4368	9,391.2	2	MV 1000	MV1000/1	1075	2.2	NONE	4368	9,391.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
	Total	**321**				**18.9**			**50120.7**	**321.0**				**18.9**				**40183.1**	**9937.6**	**0.0**	**1291.9**	**8316.0**	**1105.0**		
																		Demand Savings			**0.0**	**$0**			
																		kWh Savings			**9,938**	**$1,292**			
																		Total Savings				**$1,292**	**6.4**	**5.6**

Energy Audit of Newark Public Schools - South Street School
CHA Project No.27999
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	(kWspace) * (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	(kWspace) * (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
218LED	Boiler Room	6	W 32 C F 3 (ELE)	F43ILL/2	90	0.5	SW	1600	864	6	4 ft LED Tube	200732x3	45	0.3	NONE	1,600	432	432	0.3	$ 72.33	$ 1,306.80	$ -	18.1	18.1
50LED	Custodial Room	2	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	4 ft LED Tube	200732x2	30	0.1	NONE	2,400	144	144	0.1	$ 22.31	$ 290.40	$ -	13.0	13.0
265LED	Custodial Room	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	2400	74	1	2T 46 R LED	2RTLED	25	0.0	NONE	2,400	60	14	0.0	$ 2.23	$ -	$ -	0.0	0.0
265LED	Boiler Room Stairway	2	2B 32 C F 2 (ELE)	F22LL	31	0.1	SW	1600	99	2	2T 46 R LED	2RTLED	25	0.1	NONE	1,600	80	19	0.0	$ 3.21	$ -	$ -	0.0	0.0
265LED	Janitor Closet	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	1000	31	1	2T 46 R LED	2RTLED	25	0.0	NONE	1,000	25	6	0.0	$ 1.14	$ -	$ -	0.0	0.0
70LED	Main Entrance	3	W 32 C F 1	F41LL	32	0.1	SW	3876	372	3	4 ft LED Tube	200732x1	15	0.0	NONE	3,876	174	198	0.1	$ 28.75	$ 217.80	$ -	7.6	7.6
50LED	Main Office	9	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,296	9	4 ft LED Tube	200732x2	30	0.3	C-OCC	1,200	324	972	0.3	$ 142.53	$ 1,576.80	$ 35	11.1	10.8
18LED	Teacher's Lounge	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075	4	T 74 R LED	RTLED50	50	0.2	C-OCC	1,800	360	715	0.2	$ 107.83	$ 270.00	$ 35	2.5	2.2
70LED	Gymnasium	16	W 32 C F 1	F41LL	32	0.5	SW	2000	1,024	16	4 ft LED Tube	200732x1	15	0.2	NONE	2,000	480	544	0.3	$ 87.01	$ 1,161.60	$ -	13.4	13.4
70LED	Cafeteria	16	W 32 C F 1	F41LL	32	0.5	SW	2000	1,024	16	4 ft LED Tube	200732x1	15	0.2	C-OCC	1,400	336	688	0.3	$ 105.73	$ 1,431.60	$ 35	13.5	13.2
70LED	Kitchen	6	W 32 C F 1	F41LL	32	0.2	SW	2000	384	6	4 ft LED Tube	200732x1	15	0.1	NONE	2,000	180	204	0.1	$ 32.63	$ 435.60	$ -	13.4	13.4
70LED	Kitchen Corridor	2	W 32 C F 1	F41LL	32	0.1	SW	2000	128	2	4 ft LED Tube	200732x1	15	0.0	NONE	2,000	60	68	0.0	$ 10.88	$ 145.20	$ -	13.4	13.4
70LED	Kitchen Office	1	W 32 C F 1	F41LL	32	0.0	SW	2000	64	1	4 ft LED Tube	200732x1	15	0.0	OCC	1,400	21	43	0.0	$ 6.61	$ 200.85	$ 20	30.4	27.4
70LED	Kitchen Office	1	W 32 C F 1	F41LL	32	0.0	SW	2000	64	1	4 ft LED Tube	200732x1	15	0.0	OCC	1,400	21	43	0.0	$ 6.61	$ 200.85	$ 20	30.4	27.4
70LED	Boys Restroom	4	W 32 C F 1	F41LL	32	0.1	SW	4300	550	4	4 ft LED Tube	200732x1	15	0.1	C-OCC	3,000	180	370	0.1	$ 52.22	$ 560.40	$ 35	10.7	10.1
70LED	Girls Restroom	4	W 32 C F 1	F41LL	32	0.1	SW	4300	550	4	4 ft LED Tube	200732x1	15	0.1	C-OCC	3,000	180	370	0.1	$ 52.22	$ 560.40	$ 35	10.7	10.1
121LED	Office	4	W 34 P F 4	F44EE	144	0.6	SW	2400	1,382	4	T 74 R LED	RTLED50	50	0.2	OCC	1,200	240	1,142	0.4	$ 171.03	$ 128.25	$ 20	0.7	0.6
18LED	Nurse's Office	9	T 32 R F 4 (ELE)	F44ILL	112	1.0	SW	2400	2,419	9	T 74 R LED	RTLED50	50	0.5	NONE	2,400	1,080	1,339	0.6	$ 207.51	$ -	$ -	0.0	0.0
265LED	Nurse's Office Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	NONE	4,300	108	26	0.0	$ 3.71	$ -	$ -	0.0	0.0
50LED	Vice Principal	2	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	288	2	4 ft LED Tube	200732x2	30	0.1	C-OCC	1,200	72	216	0.1	$ 31.67	$ 418.65	$ 20	13.2	12.6
18LED	Principal - 26	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	2400	1,075	4	T 74 R LED	RTLED50	50	0.2	OCC	1,200	240	835	0.2	$ 123.43	$ 128.25	$ 20	1.0	0.9
265LED	Men's Walkway	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	NONE	4,300	108	26	0.0	$ 3.71	$ -	$ -	0.0	0.0
50LED	Men's Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,300	129	129	0.0	$ 18.57	$ 145.20	$ -	7.8	7.8
265LED	Women's Walkway	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	NONE	4,300	108	26	0.0	$ 3.71	$ -	$ -	0.0	0.0
50LED	Women's Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,300	129	129	0.0	$ 18.57	$ 145.20	$ -	7.8	7.8
71	Storage	1	I 60	I60/1	60	0.1	SW	1000	60	1	CF 26	CFQ26/1-L	27	0.0	NONE	1,000	27	33	0.0	$ 6.27	$ 6.00	$ -	1.0	1.0
70LED	Stairway 5	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	NONE	3,200	240	272	0.1	$ 40.45	$ 363.00	$ -	9.0	9.0
265LED	Stairway 5	2	2B 32 C F 2 (ELE)	F22LL	31	0.1	Breaker	3200	198	2	2T 46 R LED	2RTLED	25	0.1	NONE	3,200	160	38	0.0	$ 5.71	$ -	$ -	0.0	0.0
70LED	Room 7	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614	8	4 ft LED Tube	200732x1	15	0.1	C-OCC	1,680	202	413	0.1	$ 61.81	$ 850.80	$ 35	13.8	13.2
265LED	Room 7 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	NONE	4,300	108	26	0.0	$ 3.71	$ -	$ -	0.0	0.0
70LED	Room 8	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614	8	4 ft LED Tube	200732x1	15	0.1	C-OCC	1,680	202	413	0.1	$ 61.81	$ 850.80	$ 35	13.8	13.2
70LED	Room 5	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614	8	4 ft LED Tube	200732x1	15	0.1	C-OCC	1,680	202	413	0.1	$ 61.81	$ 850.80	$ 35	13.8	13.2
70LED	Room 25 ESL	1	W 32 C F 1	F41LL	32	0.0	SW	2400	77	1	4 ft LED Tube	200732x1	15	0.0	C-OCC	1,680	25	52	0.0	$ 7.73	$ 342.60	$ 35	44.3	39.8
70LED	Room 3	12	W 32 C F 1	F41LL	32	0.4	SW	2400	922	12	4 ft LED Tube	200732x1	15	0.2	C-OCC	1,680	302	619	0.2	$ 92.71	$ 1,141.20	$ 35	12.3	11.9
70LED	Computer Room	8	W 32 C F 1	F41LL	32	0.3	SW	2400	614	8	4 ft LED Tube	200732x1	15	0.1	C-OCC	1,680	202	413	0.1	$ 61.81	$ 850.80	$ 35	13.8	13.2
50LED	Office	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	4 ft LED Tube	200732x2	30	0.0	OCC	1,200	36	108	0.0	$ 15.84	$ 273.45	$ 20	17.3	16.0
50LED	Room 2	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
265LED	Room 2 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	NONE	4,300	108	26	0.0	$ 3.71	$ -	$ -	0.0	0.0
50LED	Room 4	12	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	4 ft LED Tube	200732x2	30	0.4	C-OCC	1,680	605	1,123	0.4	$ 167.57	$ 2,012.40	$ 35	12.0	11.8
265LED	Room 4 Restroom	1	2B 32 C F 2 (ELE)	F22LL	31	0.0	SW	4300	133	1	2T 46 R LED	2RTLED	25	0.0	NONE	4,300	108	26	0.0	$ 3.71	$ -	$ -	0.0	0.0
93	Closet	1	I 75	I75/1	75	0.1	SW	1000	75	1	CF 26	CFQ26/1-L	27	0.0	NONE	1,000	27	48	0.0	$ 9.11	$ 4.80	$ -	0.5	0.5
50LED	Room 6	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
70LED	Art Room	1	W 32 C F 1	F41LL	32	0.0	SW	2400	77	1	4 ft LED Tube	200732x1	15	0.0	NONE	2,400	36	41	0.0	$ 6.32	$ 72.60	$ -	11.5	11.5
50LED	Room 9	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 10	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 20	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 19	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 16	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 26	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	4 ft LED Tube	200732x2	30	0.0	C-OCC	1,680	50	94	0.0	$ 13.96	$ 415.20	$ 35	29.7	27.2
50LED	Room 14	8	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	4 ft LED Tube	200732x2	30	0.4	C-OCC	1,680	605	1,123	0.4	$ 167.57	$ 2,012.40	$ 35	12.0	11.8
70LED	Room 14 Hallway	1	W 32 C F 1	F41LL	32	0.0	SW	1000	32	1	4 ft LED Tube	200732x1	15	0.0	NONE	1,000	15	17	0.0	$ 3.23	$ 72.60	$ -	22.5	22.5
50LED	Room 12	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 12 Restroom	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	4300	258	1	4 ft LED Tube	200732x2	30	0.0	NONE	4,300	129	129	0.0	$ 18.57	$ 145.20	$ -	7.8	7.8
50LED	Library Room 11	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Office	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	4 ft LED Tube	200732x2	30	0.0	OCC	1,200	36	108	0.0	$ 15.84	$ 273.45	$ 20	17.3	16.0
50LED	Room 13	12	W 32 W P 2 (ELE)	F42LL	60	0.7	SW	2400	1,728	12	4 ft LED Tube	200732x2	30	0.4	C-OCC	1,680	605	1,123	0.4	$ 167.57	$ 2,012.40	$ 35	12.0	11.8
50LED	Testing Room	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	2400	144	1	4 ft LED Tube	200732x2	30	0.0	OCC	1,680	50	94	0.0	$ 13.96	$ 273.45	$ 20	19.6	18.1
50LED	Room 15	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 18	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 17	8	W 32 W P 2 (ELE)	F42LL	60	0.5	SW	2400	1,152	8	4 ft LED Tube	200732x2	30	0.2	C-OCC	1,680	403	749	0.2	$ 111.72	$ 1,431.60	$ 35	12.8	12.5
50LED	Room 17 Coat Room	1	W 32 W P 2 (ELE)	F42LL	60	0.1	SW	1000	60	1	4 ft LED Tube	200732x2	30	0.0	NONE	1,000	30	30	0.0	$ 5.70	$ 145.20	$ -	25.5	25.5
70LED	Stairway 1	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	NONE	3,200	240	272	0.1	$ 40.45	$ 363.00	$ -	9.0	9.0
70LED	Stairway 2	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	NONE	3,200	240	272	0.1	$ 40.45	$ 363.00	$ -	9.0	9.0
70LED	Stairway 3	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	NONE	3,200	240	272	0.1	$ 40.45	$ 363.00	$ -	9.0	9.0
70LED	Stairway 4	5	W 32 C F 1	F41LL	32	0.2	Breaker	3200	512	5	4 ft LED Tube	200732x1	15	0.1	NONE	3,200	240	272	0.1	$ 40.45	$ 363.00	$ -	9.0	9.0
266LED	Exterior	2	MV 1000	MV1000/1	1075	2.2	Breaker	4368	9,391	2	WPLED2T156	WPLED2T156	182	0.4	NONE	4,368	1,590	7,801	1.8	$ 1,121.11	$ -	$ 400	0.0	-0.4
S	**Total**	**321**				**18.9**			**50,121**	**321**				**8.5**			**16,765**		**10.4**	**4,956**	**40,924**	**$1,505**		
S																		**Demand Savings**		**10.4**	**$620**			
S																		**kWh Savings**		**33,355**	**$4,336**			
S																		**Total Savings**			**$4,956**		**8.3**	**8.0**

APPENDIX D

New Jersey Board of Public Utilities Incentives

i. **Smart Start**

ii. **Direct Install**

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

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

I. SMART START

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

PROGRAMS

NJ SMARTSTART BUILDINGS

EQUIPMENT INCENTIVES

APPLICATION FORMS

TOOLS AND RESOURCES

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PILOT

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

T-12 SCHOOLS LIGHTING INITIATIVE

TEACH

ARRA

TECHNOLOGIES

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

Home » Commercial & Industrial » Programs

NJ SmartStart Buildings

Program Overview

New Jersey SmartStart BUILDINGS®

With New Jersey SmartStart Buildings ...

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

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

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

Getting Started

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

Smart-Growth Eligibility: *Check to make sure your project is eligible for incentives.*

Incentives for new construction are available only for projects in areas designated for growth in the NJ State Development and Redevelopment Plan. Public school (K-12) new construction projects are exempted from this restriction and are eligible for incentives throughout the State.

Customers, or their trade allies, can determine if a location is in a designated growth area by referring to the Smart Growth Site Evaluator Tool available from the HMFA website. Contact a program representative if you are uncertain about project eligibility. The Smart Growth policies will be implemented consistent with Board Orders as described more fully in the C&I Operational Procedure Manual.

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

Support for Custom Energy-Efficiency Measures

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

Incentives for Qualifying Equipment and Projects

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

Find out more about equipment incentives!

For specific details on equipment requirements and financial incentives, including incentives for equipment not listed here, contact a program representative. Annual financial incentives may be

Program Updates

Notice of 2013 Changes to C&I Programs

Warranty and Lease Terms for CHP/Fuel Cells Increased to 10 Years

Large Combined Heat & Power/Fuel Cell Program Update

Board Order - Standby Charges for Distributed Generation Customers

Other updates posted.

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

- PROGRAMS
  - NJ SMARTSTART BUILDINGS
    - EQUIPMENT INCENTIVES
    - APPLICATION FORMS
    - TOOLS AND RESOURCES
  - PAY FOR PERFORMANCE
  - COMBINED HEAT & POWER AND FUEL CELLS
  - LOCAL GOVERNMENT ENERGY AUDIT
  - LARGE ENERGY USERS PILOT
  - ENERGY SAVINGS IMPROVEMENT PROGRAM
  - DIRECT INSTALL
  - ENERGY BENCHMARKING
  - OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS
  - EDA PROGRAMS
  - T-12 SCHOOLS LIGHTING INITIATIVE
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- TECHNOLOGIES
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Home » Commercial & Industrial » Programs » NJ SmartStart Buildings

Equipment Incentives

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 or 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 specifications needed for your project) and a current utility bill(s).

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

Electric Chillers

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

Gas Cooling

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

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)

Ground Source Heat Pumps

- Closed Loop ($450-750 per ton)

Gas Heating

- Gas-fired boilers < 300 MBH ($300 per unit)
- Gas-fired boilers ≥ 300 MBH - 1500 MBH ($1.75 per MBH)
- Gas-fired boilers ≥ 1500 MBH - ≤ 4000 MBH ($1.00 per MBH)
- Gas-fired boilers > 4000 MBH (Calculated through Custom Measure Path)
- Gas furnaces ($300-$400 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

Program Updates

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- Board Order - Standby Charges for Distributed Generation Customers

Other updates posted.

Featured Success Story

Mannington Mills:

NJ SmartStart Buildings custom measures case study presented at Globalcon Conference

Applications and Brochures

Download the latest program materials.

e-Newsletter SIGN UP TODAY!

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II. DIRECT INSTALL

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

- PROGRAMS
  - NJ SMARTSTART BUILDINGS
  - PAY FOR PERFORMANCE
  - COMBINED HEAT & POWER AND FUEL CELLS
  - LOCAL GOVERNMENT ENERGY AUDIT
  - LARGE ENERGY USERS PILOT
  - ENERGY SAVINGS IMPROVEMENT PROGRAM
  - DIRECT INSTALL
    - PARTICIPATION STEPS
    - PARTICIPATING CONTRACTORS
    - SUSTAINABLE JERSEY
  - ENERGY BENCHMARKING
  - OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS
  - EDA PROGRAMS
  - T-12 SCHOOLS LIGHTING INITIATIVE
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Home » Commercial & Industrial » Programs » Direct Install

Direct Install - Steps to Participation

New Jersey SmartStart BUILDINGS

NEW JERSEY'S CLEAN ENERGY PROGRAM DIRECT Install

SIX SIMPLE STEPS TO PARTICIPATION

CONTACT THE PARTICIPATING CONTRACTOR IN YOUR AREA

Identify the contractor assigned and trained to provide Direct Install services in the county where your project is located. Using the contact information provided, call or send an e-mail to the participating contractor to discuss your project. The contractor will schedule an energy assessment and work with you to complete the program application and participation agreement.

If you're unable to contact the participating contractor or have questions, you may contact us at 866-NJSMART or send an e-mail to DirectInstall@NJCleanEnergy.com..

REVIEW RESULTS

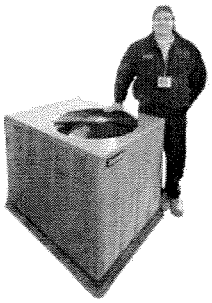
After the energy assessment, the contractor will review the results with you, including what measures qualify and your share of the project cost.

MOVE FORWARD

You will sign a scope of work document to proceed with implementation of qualifying measures.

ARRANGE INSTALLATION

You and the participating contractor will set a convenient start date for the installation.



CONFIRM INSTALLATION

Once the participating contractor completes the installation, you accept the work by signing a project completion form.

COMPLETE TRANSACTION

You pay the participating contractor your share of the project cost and New Jersey's Clean Energy Program pays the rest.

Program Updates

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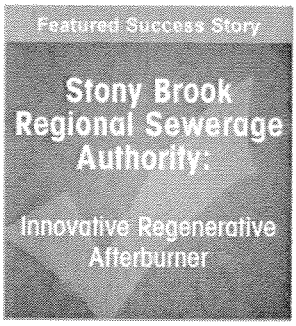

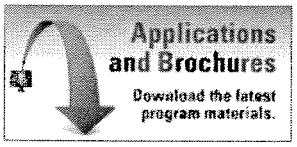

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III. PAY FOR PERFORMANCE (P4P)

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

New Jersey SmartStart BUILDINGS®

BPU

2012 PAY FOR PERFORMANCE PROGRAM
Existing Buildings Incentive Structure

Incentive #1: Energy Reduction Plan

Incentive Amount: ..... **$0.10 per sq ft**
Minimum Incentive: **$5,000**
Maximum Incentive:: ..... **$50,000 or 50% of facility annual energy cost (whichever is less)**

This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP) and is paid upon ERP approval. Incentive is contingent on implementation of recommended measures outlined in the ERP.

Incentive #2: Installation of Recommended Measures

Minimum Performance Target: **15%**

Electric Incentives

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

Gas Incentives

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

Incentive Cap: ..... **25% of total project cost**

This incentive is based on projected energy savings outlined in the ERP. Incentive is paid upon successful installation of recommended measures.

Incentive #3: Post-Construction Benchmarking Report

Minimum Performance Target: **15%**

Electric Incentives

Base Incentive based on 15% savings: ..... **$0.09 per actual kWh saved**
For each % over 15% add: ..... **$0.005 per actual kWh saved**
Maximum Incentive: ..... **$0.11 per actual kWh saved**

Gas Incentives

Base Incentive based on 15% savings: ..... **$0.90 per actual Therm saved**
For each % over 15% add: ..... **$0.05 per actual Therm saved**
Maximum Incentive: ..... **$1.25 per actual Therm saved**

Incentive Cap: ..... **25% of total project cost**

This incentive will be released upon submittal of a Post-Construction Benchmarking Report that verifies that the level of savings actually achieved by the installed measures meets or exceeds the minimum performance threshold. To validate the savings and achievement of the Energy Target, the EPA Portfolio Manager shall be used. Savings should be rounded to the nearest percent. Total value of Incentive #2 and Incentive #3 may not exceed 50% of the total project cost. Incentives will be limited to $1 million per gas and electric account per building; maximum of $2 million per project. See Participation Agreement for details.

IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

PROGRAMS

- NJ SMARTSTART BUILDINGS
- PAY FOR PERFORMANCE
- COMBINED HEAT & POWER AND FUEL CELLS
- LOCAL GOVERNMENT ENERGY AUDIT
- LARGE ENERGY USERS PILOT
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Energy Savings Improvement Program

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

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

Local Government
School Districts (K-12)

The Board also adopted protocols to measure energy savings.

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

FIRST STEP – ENERGY AUDIT

For local governments interested in pursuing an ESIP, the first step is to perform an energy audit. As explained in the Local Finance Notice, this may be done internally if an agency has qualified staff to conduct the audit. If not, the audit must be implemented by an independent contractor and not by the energy savings company producing the Energy Reduction Plan.

Pursuing a Local Government Energy Audit through New Jersey's Clean Energy Program is a valuable first step to the ESIP approach - and it's free. **Incentives provide 100% of the cost of the audit.**

ENERGY REDUCTION PLANS

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

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

Program Updates

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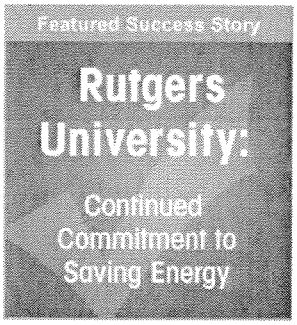

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LFN 2011-17

June 16, 2011

Local Finance Notice

Chris Christie, *Governor* | Kim Guadagno, *Lt. Governor* | Lori Grifa, *Commissioner* | Thomas H. Neff, *Director*

Update on Implementing Energy Savings Improvement Programs

This Local Finance Notice provides guidance concerning Energy Savings Improvement Program (ESIP) matters that affect local units covered under the Local Public Contracts Law (LPCL, N.J.S.A. 40A:11) and the Public School Contracts Law (PSCL, N.J.S.A. 18A:18A).

The Notice covers a model ESCO (Energy Services Company) Request for Proposal document and provides information on using the "Do-It-Yourself" process for implementing an ESIP. This Notice supplements Local Finance Notice 2009-11 concerning ESIPs.

Model ESCO Request for Proposal Document

General Issues

The Division of Local Government Services and the Board of Public Utilities have completed development of a model ESCO Request for Proposal Document. It is designed to assist all organizations (contracting units) covered by the LPCL and PSCL hire an energy services company (ESCO) to develop and implement an Energy Savings Plan (ESP) as part of an Energy Savings Improvement Program as authorized under N.J.S.A. 40A:11-4.6 and 18A:18A-4.6.

Specifically, the document serves as the starting point for these government agencies to select an ESCO through the competitive contracting procedure (N.J.S.A. 40A:11-4.1 et seq. and 18A:18A-4.1 et seq.).

Notwithstanding the efforts of the State agencies to ensure that the RFP is consistent with all relevant procurement procedures, laws, and regulations, there are several issues contracting unit personnel should keep in mind:

1) Local legal advisors should review the document to ensure it is consistent with any allowable local practices and legal considerations.
2) The individual responsible for managing the project should review the entire RFP in order to be able to answer questions and ensure the document meets local needs.
3) Forms have been carefully designed to meet the need of this specific process. Care should be taken if proposed forms are removed and replaced with ones normally used by the contracting unit.

Contact Information

Director's Office
V. 609.292.6613
F. 609.292.9073

Local Government Research
V. 609.292.6110
F. 609.292.9073

Financial Regulation and Assistance
V. 609.292.4806
F. 609.984.7388

Local Finance Board
V. 609.292.0479
F. 609.633.6243

Local Management Services
V. 609.292.7842
F. 609.633.6243

Authority Regulation
V. 609.984.0132
F. 609.984.7388

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E-mail: dlgs@dca.state.nj.us

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School Business Administrators
Local Procurement Officials

The RFP also uses a formal process for potential proposers to submit questions and requests for clarifications. Appendix B is a form for the submission of these requests and is referred to throughout the text.

Contracting units are also reminded the Competitive Contracting process does not allow for negotiating proposals. While legal elements of the contract (project development agreement) may require legal determinations and modifications, the process does not allow for negotiation of price or related substantive elements and any element that would have provided less than a level playing field for proposers.

Contracting units are also cautioned that setting qualification standards that arbitrarily limit competition is inconsistent with public bidding requirements.

Office of State Comptroller Filing: Contracting units are also reminded of their obligations to meet State Comptroller requirements for public contracts. In accordance with N.J.S.A 52:15C-10, contracting units must notify OSC as early as practicable, but no later than 30 days before advertisement, of any negotiation or solicitation of a contract that may exceed $10 million. Contracting units must also provide post-award notification for any contract for an amount exceeding $2 million. Notification must be given within 20 days of the award.

Substantive Edits:

Several sections are highlighted in green. These sections should be carefully edited to meet contracting unit needs. This has important application to evaluation criteria in Section D. Once finalized, the green highlight should be removed.

Section B-16; Insurance should be reviewed by the contracting unit's Risk Management professionals to be sure the standards are appropriate to the contracting unit and the work to be done.

The following Sections also require local decisions and editing:

- A-3: # of copies of proposal and # of CDs to be submitted
- A-4: Web posting address, if desired
- A-5: If extra credit is to be provided on evaluation scoring for attending site walk through
- B-11: Delete LPCL or PSCL section as appropriate
- B-34: Use only if PSCL
- C-1: Explanation of type of audit information
- C-3(k): Include if ESCO is to provide financing option
- Use of Appendix F and Proposal Requirements #8: These forms are related to submission of Political Contribution Disclosure forms. Only PSCL agencies are required to use these forms as pursuant to Public School Fiscal Accountability Procedures (N.J.A.C. 6A23A-6.3). The forms and references to it should be removed for all LPCL users.

Under the ESIP DIY approach, there would be no conflict in a properly procured single organization conducting the audit, developing the ESP, then preparing plans and specifications. This does not apply when using the ESCO approach, where the auditor and ESCO must be independent.

Once construction plans and specifications are complete, the contracting unit would then conduct the bidding process as it would any public works construction project: manage the project as it sees fit (the firm that did the plans could also serve as construction manager), and then contract as necessary for commissioning and final third party verification. The two verification steps (the ESP and verifying implementation) must be performed by an organization independent of the ones preparing the ESP, overseeing construction and commissioning.

By following this process, the contracting unit can then apply to the Local Finance Board for the issuance of ESIP-based energy saving obligations or enter into appropriate lease financing.

The ESIP approach to energy improvement provides a range of options for contracting units to accrue energy savings while improving the environment, taking advantage of low-cost financing and state and federal incentives. DLGS and the BPU encourage comments and questions (through the ESIP web page) on this new opportunity so we can improve it as time goes on.

Approved: Thomas H. Neff, Director, Division of Local Government Services

Table of Web Links

Page	Shortcut text	Internet Address
1, 4	Local Finance Notice 2009-11	http://www.nj.gov/dca/lgs/lfns/09lfns/2009-11.doc
2	ESIP webpage	http://www.nj.gov/dca/lgs/lpcl/esip.htm
2	email comments	mailto:lpcl@dca.state.nj.us
2	to register (via email	mailto:lpcl@dca.state.nj.us
2	GovConnect Local Procurement	http://www.nj.gov/dca/surveys/ppsurvey.htm
3	State Comptroller requirements.	http://www.nj.gov/comptroller/compliance/index.html

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

New Jersey SmartStart BUILDINGS

BPU

2012 PAY FOR PERFORMANCE PROGRAM
Existing Buildings Incentive Structure

Incentive #1: Energy Reduction Plan

Incentive Amount: ..... **$0.10 per sq ft**
Minimum Incentive: **$5,000**
Maximum Incentive:: ..... **$50,000 or 50% of facility annual energy cost (whichever is less)**

This incentive is designed to offset the cost of services associated with the development of the Energy Reduction Plan (ERP) and is paid upon ERP approval. Incentive is contingent on implementation of recommended measures outlined in the ERP.

Incentive #2: Installation of Recommended Measures

Minimum Performance Target: **15%**

Electric Incentives

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

Gas Incentives

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

Incentive Cap: ..... **25% of total project cost**

This incentive is based on projected energy savings outlined in the ERP. Incentive is paid upon successful installation of recommended measures.

Incentive #3: Post-Construction Benchmarking Report

Minimum Performance Target: **15%**

Electric Incentives

Base Incentive based on 15% savings: ..... **$0.09 per actual kWh saved**
For each % over 15% add: ..... **$0.005 per actual kWh saved**
Maximum Incentive: ..... **$0.11 per actual kWh saved**

Gas Incentives

Base Incentive based on 15% savings: ..... **$0.90 per actual Therm saved**
For each % over 15% add: ..... **$0.05 per actual Therm saved**
Maximum Incentive: ..... **$1.25 per actual Therm saved**

Incentive Cap: ..... **25% of total project cost**

This incentive will be released upon submittal of a Post-Construction Benchmarking Report that verifies that the level of savings actually achieved by the installed measures meets or exceeds the minimum performance threshold. To validate the savings and achievement of the Energy Target, the EPA Portfolio Manager shall be used. Savings should be rounded to the nearest percent. Total value of Incentive #2 and Incentive #3 may not exceed 50% of the total project cost. Incentives will be limited to $1 million per gas and electric account per building; maximum of $2 million per project. See Participation Agreement for details.

APPENDIX E

Photovoltaic Analysis

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Newark Public Schools
South St Elementary School

Cost of Electricity	$0.149	/kWh
Electricity Usage	148,920	kWh/yr
System Unit Cost	$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$40,000	**10.0**	**12,796**	**0**	**$1,908**	**0**	**$1,908**	**$0**	**$1,600**	**21.0**	**11.4**

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= $125 /1000kwh

Area Output*

314 m2
3,385 ft2

Perimeter Output*

131 m
428 ft

Available Roof Space for PV:
(Area Output - 5 ft x Perimeter)
1,243 ft2

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

11.5 watt/ft2
14,291 DC watts
10 kW Enter into PV Watts

PV Watts Inputs***

Array Tilt Angle	40	Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)
Array Azimuth	180	Enter into PV Watts (default)
Zip Code	07114	Enter into PV Watts
DC/AC Derate Factor	0.83	Enter info PV Watts

PV Watts Output

12,796 annual kWh calculated in PV Watts program

% Offset Calc

Usage	148,920	(from utilities)
PV Generation	12,796	(generated using PV Watts)
% offset	9%	

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

PVWatts * * * AC Energy & Cost Savings

Cautions for Interpreting the Results

South Street elemntary School, Newark, NJ

Station Identification	
City:	Newark
State:	New_Jersey
Latitude:	40.70° N
Longitude:	74.17° W
Elevation:	9 m
PV System Specifications	
DC Rating:	10.0 kW
DC to AC Derate Factor:	0.830
AC Rating:	8.3 kW
Array Type:	Fixed Tilt
Array Tilt:	40.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	14.9 ¢/kWh

Results			
Month	Solar Radiation (kWh/m ^{2}/day)	AC Energy (kWh)	Energy Value ($)
1	3.35	891	132.76
2	4.04	963	143.49
3	4.58	1171	174.48
4	4.85	1148	171.05
5	5.32	1268	188.93
6	5.35	1198	178.50
7	5.29	1209	180.14
8	5.27	1193	177.76
9	5.06	1154	171.95
10	4.45	1084	161.52
11	3.14	773	115.18
12	2.86	745	111.00
Year	4.47	12796	1906.60

Output Hourly Performance Data * Output Results as Text

About the Hourly Performance Data Saving Text from a Browser

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

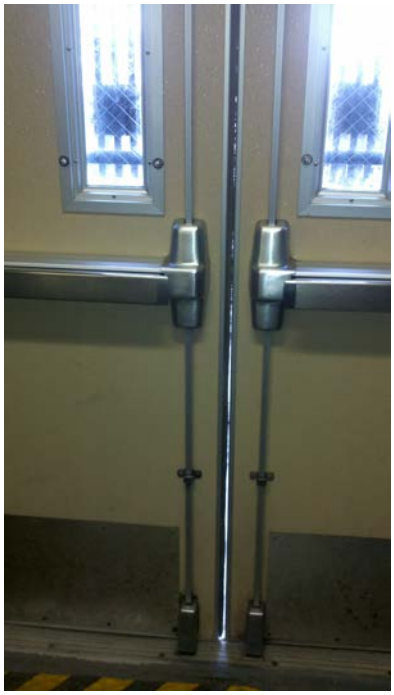
Please send questions and comments regarding PVWATTS to Webmaster

Disclaimer and copyright notice

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

APPENDIX F

Photos



1: Gap allows excess infiltration

3: Typical Window AC in Building

2: Steam systems operate less efficiently than HW

APPENDIX G

EPA Portfolio Manager

ENERGY STAR® Statement of Energy Performance

44

ENERGY STAR® Score[1]

South St. School

Primary Property Function: K-12 School
Gross Floor Area (ft²): 35,040
Built: 1883

For Year Ending: May 31, 2013
Date Generated: April 14, 2014

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

Property & Contact Information

Property Address
South St. School
151 South St.
Newark, New Jersey 07114

Property Owner
Newark Public Schools
2 Cedar Street
Newark, NJ 07102
(____)____-_____

Primary Contact
Gregory Coleman
10 Maxwell Drive
Suite 200
Clifton Park, NY 12065
000-000-0000
mvadney@trcsolutions.com

Property ID: 3928071

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
95.4 kBtu/ft²

Source EUI
130.5 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,836,779 (85%)
Electric - Grid (kBtu)	507,433 (15%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	91
National Median Source EUI (kBtu/ft²)	124.4
% Diff from National Median Source EUI	5%

Annual Emissions

Greenhouse Gas Emissions (MtCO2e/year)	215

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)