

# **BLOOMFIELD SCHOOL DISTRICT**

**FAIR VIEW ELEMENTARY SCHOOL**  
376 Berkeley Avenue Bloomfield NJ, 07003

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

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**CHA PROJECT NO. 30040**

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## REPORT DISCLAIMER

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

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

## List of Common Energy Audit Abbreviations

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

## 1.0 EXECUTIVE SUMMARY

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

| Building Name                      | Address                                    | Square Feet | Construction Date |
|------------------------------------|--------------------------------------------|-------------|-------------------|
| <b>Fair View Elementary School</b> | 376 Berkeley Avenue<br>Bloomfield NJ 07003 | 57,950      | 1899              |

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

| Building Name                      | Electric Savings (kWh) | NG Savings (therms) | Total Savings (\$) | Payback (years) |
|------------------------------------|------------------------|---------------------|--------------------|-----------------|
| <b>Fair View Elementary School</b> | 19,546                 | 1,378               | \$5,021            | 10.0            |

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

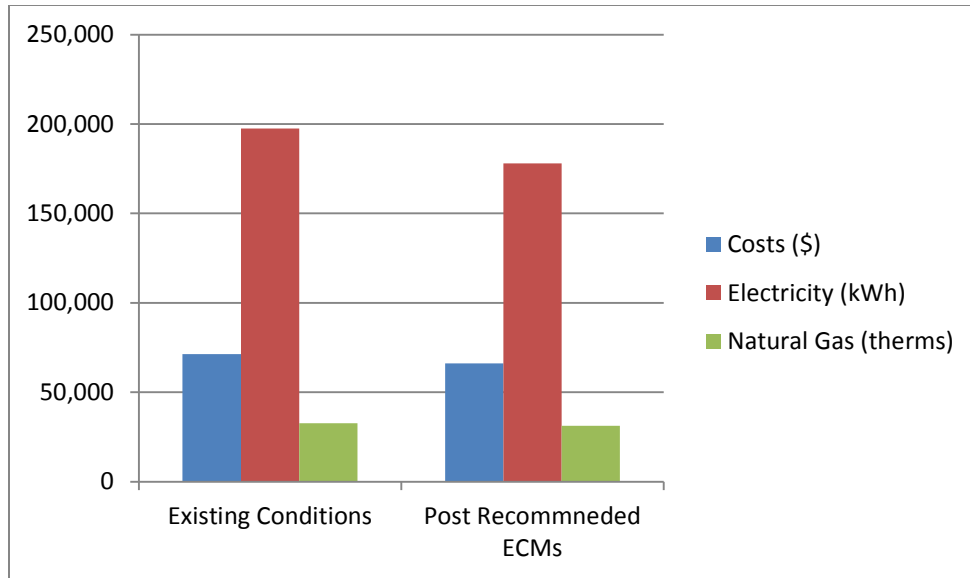
| ECM #                     | Energy Conservation Measure                             | Est. Costs (\$) | Est. Savings (\$/year) | Payback w/o Incentive | Potential Incentive (\$)* | Payback w/ Incentive | Recommended |
|---------------------------|---------------------------------------------------------|-----------------|------------------------|-----------------------|---------------------------|----------------------|-------------|
| <b>ECM-1</b>              | Window Replacement                                      | 46,900          | 573                    | 81.8                  | 0                         | 81.8                 | N           |
| <b>ECM-2</b>              | Add Attic Insulation                                    | 23,200          | 1,598                  | 14.5                  | 0                         | 14.5                 | Y           |
| <b>ECM-3</b>              | Boiler Replacement                                      | 245,157         | 4,550                  | 53.9                  | 5,600                     | 52.7                 | N           |
| <b>ECM-4</b>              | Install Window AC Controller                            | 1,040           | 301                    | 3.4                   | 0                         | 3.4                  | Y           |
| <b>ECM-L1**</b>           | Lighting Replacements / Upgrades                        | 20,785          | 2,650                  | 7.8                   | 2,650                     | 6.8                  | N           |
| <b>ECM-L2**</b>           | Install Lighting Controls (Add Occupancy Sensors)       | 5,130           | 726                    | 7.1                   | 726                       | 6.1                  | N           |
| <b>ECM-L3</b>             | Lighting Replacements with Controls (Occupancy Sensors) | 25,915          | 3,122                  | 8.3                   | 3,122                     | 7.3                  | Y           |
| <b>Total**</b>            |                                                         | <b>342,212</b>  | <b>10,144</b>          | <b>33.7</b>           | <b>8,722</b>              | <b>32.9</b>          |             |
| <b>Total(Recommended)</b> |                                                         | <b>50,155</b>   | <b>5,021</b>           | <b>10.0</b>           | <b>3,122</b>              | <b>9.4</b>           |             |

\* Incentive shown, if available, is per the New Jersey SmartStart Program.

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

If Bloomfield School District implements the recommended ECMs, energy savings would be as follows:

|                       | Existing Conditions | Post Recommended ECMs | Percent Savings |
|-----------------------|---------------------|-----------------------|-----------------|
| Costs (\$)            | 71,283              | 66,262                | 7%              |
| Electricity (kWh)     | 197,542             | 177,996               | 10%             |
| Natural Gas (therms)  | 32,659              | 31,281                | 4%              |
| Site EUI (kbtu/SF/Yr) | 68.0                | 64.5                  |                 |



## 2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

The following is a summary of building information related to HVAC, plumbing, building envelope, lighting, 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 representative photos of some of the existing conditions observed while onsite.

**Building Name:** Fair View Elementary School  
**Address:** 376 Berkeley Avenue Bloomfield NJ 07003  
**Gross Floor Area:** 57,950 sq. ft.  
**Number of Floors:** Basement and three floors  
**Year Built:** 1899



### General

**Description of Spaces:** The building is used as an elementary school and has classrooms, media center, multi-purpose room, offices, storage rooms, restrooms and a boiler room.

**Description of Occupancy:** The facility has 64 permanent employees working during regular school hours.

**Number of Computers:** The building has approximately 35 desktop and laptop computers.

**Building Usage:** Normal operating hours for the school are from 8.30 AM to 3.30 PM. However, some of the employees like office staff, teaching staff and custodial staff work before and after the normal school operating hours.

**Construction:** Structural steel framing with concrete masonry unit walls having a brick façade. Based on the building's vintage, it is assumed that the walls have little to no insulation.

**Roof:** The main building has a sloped roof. The maintenance staff stated that the attic either does not have insulation or the insulation has lost its effectiveness. An ECM related to adding attic insulation has been evaluated. The multi-purpose room wing has flat roof with a black rubber membrane waterproofing. It is believed that the roof is well insulated and appears to be in good condition. No ECMs associated with the flat roof have been evaluated

**Windows:** The basement and third floors windows are double pane and are in good condition. However, the first and second floors windows are single pane and in fair condition. An ECM related to window replacement for the first and second floor windows has been evaluated.

**Exterior Doors:** Exterior man doors are steel with glass panels and are in good condition. However, the door seals and sweeps show signs of wear. A recommendation has been included to replace the door seals and sweeps in the O&M section.

### **Heating Ventilation & Air Conditioning (HVAC) Systems**

**Heating:** The building is heated by two low pressure (15PSI) steam boilers located in the basement boiler room. One of the boilers is a 200 HP unit by York Shipley installed in 2010 and the other is a 165 HP unit by Kewanee installed in 1926. Steam is supplied to all the spaces by a network of steam supply and condensate return piping. Condensate is returned to the boiler room by gravity. An automatic boiler feed unit installed in the boiler room pumps make up water and return condensate to the boilers. The operation of the steam boilers is controlled both by an outside air temperature sensor and a time clock. Classrooms on all floors are provided with unit ventilators. Hallways, stairways, storage spaces and offices are provided with steam radiators. The multi-purpose room is heated by a heating and ventilation unit equipped with steam heating coils. The Kewanee boiler is over 80 years old. An ECM related to replacing the Kewanee boiler has been evaluated. During the walkthrough the maintenance staff did not mention any issues with the steam traps. Steam traps should be periodically checked and maintained so that the heating system works efficiently. An O&M recommendation has been made to perform a steam trap survey.

As an alternate to replacing the old steam boiler, it is recommended that the School District consider a longer term solution that includes replacing the existing steam heating system with a hot water system. The steam system is past its useful life and will continue to be a source of maintenance and will ultimately need to be replaced. A hot water system provides energy savings and maintenance cost reductions each year for the life of system as well as providing increased occupant comfort. The cost as well as the payback period for upgrading the steam system to a hot water system is high therefore further study is recommended prior to pursuing this as an energy conservation measure.

**Cooling:** A chilled water system, installed in 2007, provides cooling to the third floor spaces only. A 60 ton nominal cooling capacity Trane air cooled chiller is installed on the roof of the multi- purpose building. Chilled water is circulated through two inline constant speed centrifugal pumps installed in a machine room on the third floor. All third floor spaces are provided with unit ventilators that are equipped with chilled water cooling coils and steam heating coils. Additionally, staff room, nurse's office, principal's office and main office are provided with window air conditioners. All equipment associated with the chilled water system and window air conditioners are in good condition. No ECM associated with the cooling system has been evaluated.

Details of the equipment are shown in the Table below.

| Description                  | Manufacturer Name | Equipment Type / Utility                                           | Capacity/Size /Efficiency                         | Location                                     | Areas/Equipment Served          |
|------------------------------|-------------------|--------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------|---------------------------------|
| Boiler                       | York Shipley      | Gas fired fire tube low pressure steam boiler                      | 8315 MBH Maximum input, 6695 MBH output           | Boiler Room in basement                      | Heating system for whole School |
| Boiler                       | Kewanee           | Gas fired low pressure steam boiler                                | 5600 lbs/hr steam at 15 PSI                       | Boiler Room in basement                      | Heating system for whole School |
| Air Cooled Chiller           | Trane             | Air Cooled Water Chiller                                           | 55.5 Tons @ 44 deg F LWT, 95 deg F ambient        | Roof                                         | Cooling for Third Floor         |
| Chilled Water Pumps          | Armstrong         | In Line Chilled Water Pumps                                        | 105 GPM @ 70 Feet Head with 5.0 HP Electric Motor | Machine Room on 3rd Floor                    | Third Floor of School           |
| Unit Ventilators             | Trane             | Unit Ventilator with chilled water cooling and steam heating coils | N/A                                               | Classrooms on 3rd Floor                      | Classrooms                      |
| Unit Ventilators             | Herman Nelson     | Unit Ventilator with steam heating coil                            | N/A                                               | Classrooms in Basement, 1st and 2nd floors   | Classrooms                      |
| Heating and Ventilation Unit | Herman Nelson     | H&V Unit with steam heating coil and belt driven electric motor    | N/A                                               | Machine Room in Multi-Purpose Room mezzanine | Multi-Purpose Room              |

**Ventilation:** Unit ventilators provided in classrooms take in outside air for ventilation through a ducted connection to an outside air intake louver. Outside air is controlled by unit ventilator dampers that are pneumatically operated. The multi-purpose room heating and ventilation unit has a ducted air intake connection from an outside air intake louver. As ventilation rates are assumed to be minimal, there are no ECMs associated with the ventilation system.

**Exhaust:** This building has multiple fractional HP exhaust fans serving restrooms and general exhaust located on the roof. The fans are enclosed and therefore the capacities of fan motors are unknown. No ECMs were evaluated for the exhaust fans.

### **Controls Systems**

The overall building controls are pneumatically operated. The boilers' operation is controlled both by an outside air temperature control and a time clock. Unit ventilators are equipped with steam control valves controlled by room thermostats. The heating and ventilation unit serving the multi-purpose room is controlled by a two way control valve. All controls are operated by pneumatic controls. A Curtis air compressor with a Hankison dryer unit is installed in the boiler room. Typical heating set point was reported to be 70° F. The air cooled chiller has integral control to maintain set chilled water temperatures. Unit ventilators that have chilled water and steam coils have control valves responding to room temperature sensors. Typical cooling set point was reported to be 72° F. The chilled water control valves are two way however the chilled water pumps are constant speed. A differential pressure bypass system is installed to maintain constant water flow through the chiller. The Trane chiller design is based on fixed constant water flow in the chiller. Window air conditioners are controlled by individual thermostats. An ECM related to installing window AC unit controllers has been evaluated.

Although the existing pneumatic control system is in good working condition and provides basic day/night functions, the School District should consider replacing the existing pneumatic control system with a Direct Digital Control (DDC) system. The advantages of this type of system include individual unit controllability and scheduling, trending of set points and alarm notifications for malfunctioning devices. Front end graphics available in a DDC system enable the maintenance staff to see the functioning of all systems at one location and provide service to trouble spots quickly and efficiently. Web based control systems allow access and adjustment from remote locations. The cost as well as the payback period for upgrading the pneumatic control system to a DDC control system is high therefore further study is recommended prior to pursuing this as an energy conservation measure.

### **Domestic Hot Water Systems**

Domestic hot water to the entire school is provided by a Vanguard gas fired water heater installed in the boiler room. The water heater, installed in 2005, is in good condition. No ECM related to replacing the water heater has been evaluated.

### **Kitchen Equipment**

There is no kitchen in this building. Prepared food is brought in and warmed up before serving the students. Food warming equipment is in good condition. A recommendation has been included in the O&M section to purchase Energy Star rated equipment when old ones need replacement.

### **Plug Load**

This building has computers and printers/copiers which contribute to the plug load in the building. We have calculated the plug loads to have minimal impact compared to other electric consuming devices. A recommendation has been included in the O&M section to purchase Energy Star rated equipment when old ones need replacement.

## **Plumbing Systems**

The urinals and toilets appear to be high flow plumbing fixtures. The sink faucets do not appear to have low-flow type aerators. An analysis for reducing the water consumption was not performed since the school informed us that water is provided to them at no cost. Although the cost of water usage in most facilities is relatively small compared with costs of electric and gas usage, reducing water usage helps conserve and protect vital water supply sources. Hence, a recommendation has been included in the O&M section to install low-flow plumbing fixtures and aerators when fixture replacement is planned.

## **Lighting Systems**

The school has a mixture of T-12 and T-8 fluorescent lighting fixtures. The multi-purpose room has 60 wraparound T-12 fluorescent fixtures. Some spaces like the boiler room, restrooms, janitor's closets and storage rooms are provided with incandescent lights. Exterior lights are floodlights. All the lights in this building are controlled by manual switches except exterior lights which are controlled by timer. LED lights are recommended in this study. We have provided three alternatives for the observed lighting that include adding occupancy sensors to the existing lights, replacing the lights with LED lights and a third ECM that evaluates adding occupancy sensors to the proposed LED lights.

### 3.0 UTILITIES

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

|           | Electric      | Natural Gas |
|-----------|---------------|-------------|
| Deliverer | PSE&G         | PSE&G       |
| Supplier  | Direct Energy | PSE&G       |

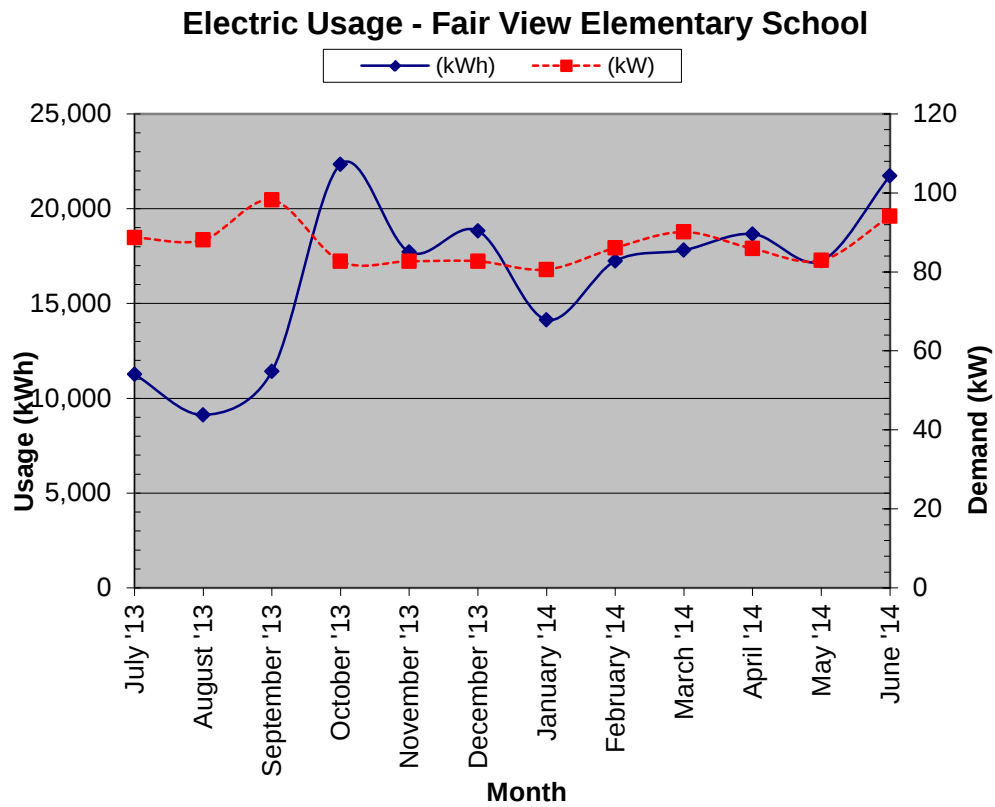
For the 12-month period ending in June 2014, the utilities usages and costs for the building were as follows:

| Electric           |         |          |
|--------------------|---------|----------|
| Annual Consumption | 197,542 | kWh      |
| Annual Cost        | 37,314  | \$       |
| Blended Unit Rate  | 0.189   | \$/kWh   |
| Supply Rate        | 0.152   | \$/kWh   |
| Demand Rate        | 7.08    | \$/kW    |
| Peak Demand        | 94.1    | kW       |
| Natural Gas        |         |          |
| Annual Consumption | 32,659  | Therms   |
| Annual Cost        | 33,969  | \$       |
| Unit Rate          | 1.040   | \$/therm |

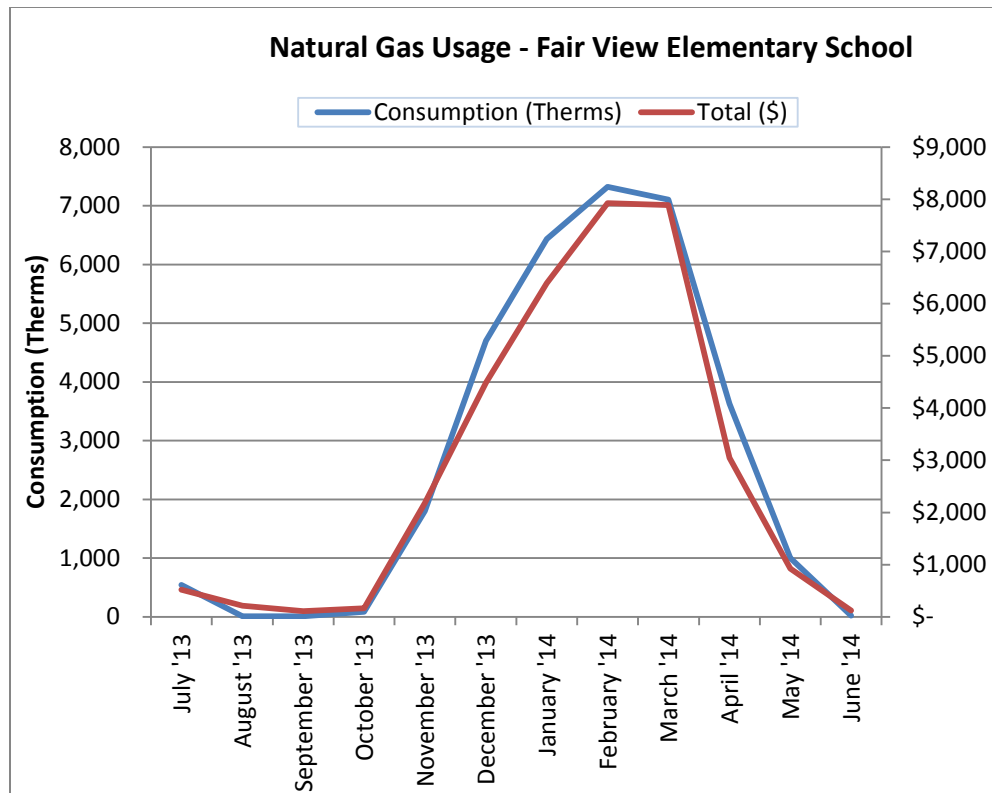
Blended Rate: Average rate charged determined by the annual cost / annual usage

Supply Rate: Estimated

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



The electric usage fluctuates with the building usage. The graph shows smaller electric usage in July, August and September because the school is mostly not operational during these months.



Natural gas in this building is used by hot water boiler and domestic hot water heater(DHW). The gas usage in non-heating season is small and only for DHW heating. The gas usage during the heating season is correlated to winter weather conditions.

See Appendix A for utility analysis.

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

| Comparison of Utility Rates to NJ State Average Rates* |          |              |                 | Recommended to Shop for Third Party Supplier? |
|--------------------------------------------------------|----------|--------------|-----------------|-----------------------------------------------|
| Utility                                                | Units    | Average Rate | NJ Average Rate |                                               |
| Electricity                                            | \$/kWh   | \$0.189      | \$0.13          | Y                                             |
| Natural Gas                                            | \$/Therm | \$1.040      | \$0.96          | Y                                             |

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

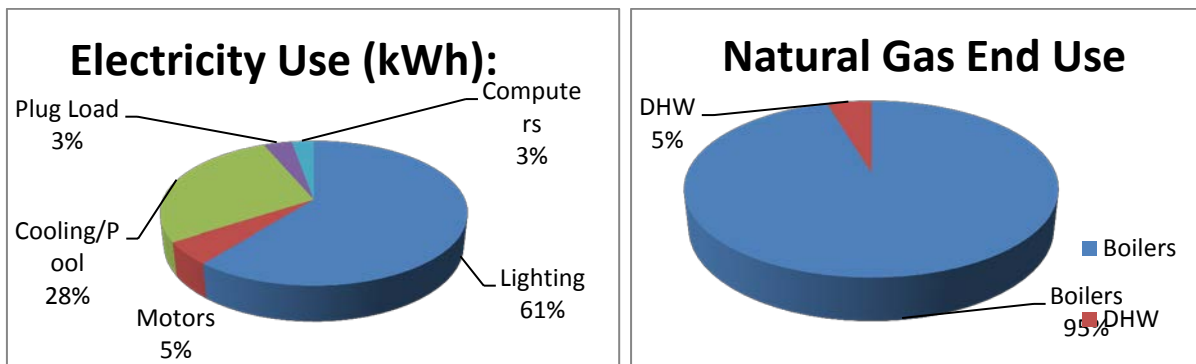
Additional information on selecting a third party energy supplier is available here:

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

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

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

### Site End-Use Utility Profile



#### 4.0 BENCHMARKING

The EPA Portfolio Manager benchmarking tool provides a site and source Energy Use Intensity (EUI), as well as an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft<sup>2</sup>/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100, with 100 being the most efficient. In order for a building to receive an Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed measures, the Energy Star rating will increase. However, the EPA does not have a score for all types of buildings. The buildings that do not have an energy rating now are compared with the national median EUI.

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 <sup>2</sup> /yr | Source EUI (kBtu/ft <sup>2</sup> /yr) | Energy Star Rating (1-100) |
|-----------------------------------|---------------------------------------|----------------------------|
| 68                                | 95.7                                  | 39                         |

The school building's Energy Star score is 39. The score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide. A score of 50 represents median energy performance and a score of 75 or higher indicates that the building is a top performer. The site EUI of the school building is 68 and source EUI is 95.7. The building has higher EUIs than the national median EUIs (national median site EUI is 61.8 kBtu/ft<sup>2</sup> and national median source EUI is 87 kBtu/ft<sup>2</sup>). The EUI of this building is 10% higher than the national median. It is believed that the lack of efficient lighting and lighting controls are contributing to this high EUI. The EUI could be reduced after implementing some of the proposed energy conservation measures.

EPA Portfolio Manager can be accessed with the following.



## 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 Window Replacement

The basement and the third floors of the school are provided with double pane windows and are in good condition. However, the first and second floors have single pane windows and are in fair condition. The single pane windows lead to large amount of the heating/cooling loss. Replacing these old windows with high heat resistance double pane windows will help reduce the energy loss and save energy.

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

### ECM-1 Window Replacement

| Budgetary Cost | Annual Utility Savings |     |             |       | ROI   | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-----|-------------|-------|-------|----------------------|-----------------------------|--------------------------|
|                | Electricity            |     | Natural Gas | Total |       |                      |                             |                          |
| \$             | kW                     | kWh | Therms      | \$    |       | \$                   | Years                       | Years                    |
| 46,900         | 0                      | 0   | 551         | 573   | (0.7) | 0                    | 81.8                        | 81.8                     |

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

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

## 5.2 ECM-2 Attic Insulation

Presently there is minimal loose-fill insulation in the attic which allows for excessive heat loss. The addition of insulation materials of blown in fiberglass or cellulose insulation throughout the attic will reduce heating fuel consumption by allowing building to maintain the internal temperature for longer.

The savings for this ECM is calculated by estimating the internal heat load of the building using BIN data and establishing a typical R-value (R-10) of an existing attic; this is compared to a new R-value (R-38) for the proposed scenario. The difference in R-values results in a difference of energy lost through the walls and ceiling. The difference multiplied by the annual hours is the energy savings.

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

### ECM-2 Attic Insulation

| Budgetary Cost | Annual Utility Savings |     |             |       | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-----|-------------|-------|-----|----------------------|-----------------------------|--------------------------|
|                | Electricity            |     | Natural Gas | Total |     |                      |                             |                          |
| \$             | kW                     | kWh | Therms      | \$    |     | \$                   | Years                       | Years                    |
| 23,200         | 0                      | 870 | 1,378       | 1,598 | 0.0 | 0                    | 14.5                        | 14.5                     |

\* There are no Incentives per the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is recommended.

### 5.3 ECM-3 Boiler Replacement

The building is heated by two low pressure (15PSI) steam boilers located in the basement boiler room. One of the boilers is a 200 HP unit by York Shipley installed in 2010 and the other is a 165 HP unit by Kewanee installed in 1926. This ECM evaluates replacing the existing Kewanee gas fired steam boiler with a new steam boiler to operate as the main boiler with the newly installed (2010) York Shipley boiler. The two boilers could be run on a lead lag programmed sequence to evenly load boiler operation. The existing Pacific boiler, installed in 1926, with an estimated efficiency of 75% has lived its useful life. Apart from savings in energy, savings will also be made on additional maintenance material costs and man hours incurred on account of high maintenance of old boiler.

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

#### ECM-3 Boiler Replacement

| Budgetary Cost | Annual Utility Savings |     |             |       | ROI   | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-----|-------------|-------|-------|----------------------|-----------------------------|--------------------------|
|                | Electricity            |     | Natural Gas | Total |       |                      |                             |                          |
| \$             | kW                     | kWh | Therms      | \$    |       | \$                   | Years                       | Years                    |
| 245,157        | 0                      | 0   | 4,375       | 4,550 | (0.7) | 5,600                | 53.9                        | 52.7                     |

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

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

As an alternate to replacing the old steam boiler, it is also recommended that the School District consider a longer term solution that includes replacing the existing steam heating system with a hot water system. The steam system is past its useful life and will continue to be a source of maintenance and will ultimately need to be replaced. Although the first cost of converting the existing steam system to a hot water system is high, this system will offer energy savings and maintenance cost reductions each year for the life of system as well as providing increased occupant comfort. The cost as well as the payback period for upgrading the steam system to a hot water system is high, therefore further study is recommended prior to pursuing this as an energy conservation measure.

### 5.4 ECM-4 Install Window AC Unit Controllers

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

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

#### ECM-4 Install Window AC Unit Controllers

| Budgetary Cost | Annual Utility Savings |       |             |       | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-------|-------------|-------|-----|----------------------|-----------------------------|--------------------------|
|                | Electricity            |       | Natural Gas | Total |     |                      |                             |                          |
| \$             | kW                     | kWh   | Therms      | \$    |     | \$                   | Years                       | Years                    |
| 1,040          | 0                      | 1,595 | 0           | 301   | 3.3 | 0                    | 3.4                         | 3.4                      |

\* There are no Incentives per the New Jersey SmartStart Program. See section 6.0 for other incentive opportunities.

This measure is recommended.

#### 5.5.1 ECM-L1 Lighting Replacement / Upgrades

The school has a mixture of T-12 and T-8 fluorescent lighting fixtures. The multi-purpose room has 60 wraparound T-12 fluorescent fixtures. Some spaces like the boiler room, restrooms, janitor's closets and storage rooms are provided with incandescent lights. Exterior lights are floodlights. LED lights are recommended in this study.

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                    |
| 20,785         | 6                      | 13,975 | 0           | 2,650 | 1.3 | 2,650                | 7.8                         | 6.8                      |

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

This measure is not recommended in lieu of ECM L3.

#### 5.5.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

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

This measure recommends installing occupancy sensors for the current lighting system. Using a process similar to that utilized in Section ECM-L1, the energy savings for this measure was calculated by applying the known fixture wattages in the space to the estimated existing and proposed times of operation for each fixture.

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

#### **ECM-L2 Install Lighting Controls (Occupancy Sensors)**

| Budgetary Cost | Annual Utility Savings |       |             |       | ROI | Potential Incentive* | Payback (without incentive) | Payback (with incentive) |
|----------------|------------------------|-------|-------------|-------|-----|----------------------|-----------------------------|--------------------------|
|                | Electricity            |       | Natural Gas | Total |     |                      |                             |                          |
| \$             | kW                     | kWh   | Therms      | \$    |     | \$                   | Years                       | Years                    |
| 5,130          | 0                      | 4,776 | 0           | 726   | 1.6 | 726                  | 7.1                         | 6.1                      |

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

This measure is not recommended in lieu of ECM L3.

### **5.5.3 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                    |
| 25,915         | 6                      | 17,081 | 0           | 3,122 | 1.2 | 3,122                | 8.3                         | 7.3                      |

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

This measure is recommended.

## **5.6 Additional O&M Opportunities**

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

- Replace door seals and sweeps.
- Perform steam trap survey.
- Purchase ENERGY STAR® rated equipment when old ones need replacement.
- Replace high flow plumbing fixtures with low flow plumbing fixtures and aerators

## **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 city 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.

Fair View Elementary School qualifies for direct install program since the peak electric demand during the 12 month evaluation period was less than 200 KW.

Refer to Appendix D for more information on this program.

### **6.1.3 New Jersey Pay For Performance Program (P4P)**

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

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

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

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

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

#### Electric

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

#### Gas

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

Incentive cap: 25% of total project cost

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

#### Electric

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

#### Gas

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

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

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

### **6.1.4 Energy Savings Improvement Plan**

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

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

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

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

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

#### **6.1.5 Renewable Energy Incentive Program**

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

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

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

## 7.0 | ALTERNATIVE ENERGY SCREENING EVALUATION

### 7.1 Solar

#### 7.1.1 Photovoltaic 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 <sup>2</sup> ) | Potential PV Array Size (kW) |
|----------------------------------------|------------------------------|
| 3,767                                  | 53                           |

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 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 \$200/SREC for 2015 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 – 53 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         |
| \$212,000      | 53.0                   | 67,569 | 0           | \$12,771      | \$14,527                  | 16.6                   | 7.8                 | 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 should consult with a certified solar PV contractor.

### 7.1.2 Solar Thermal Hot Water Generation

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

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

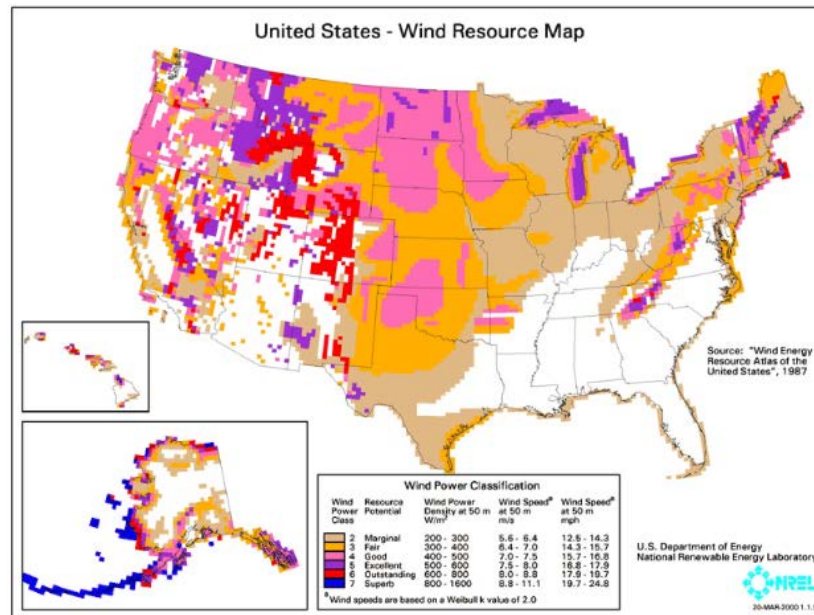
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping).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

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

### 7.2 Wind Powered Turbines

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

mounted onto a tower. Newer wind turbines also use advanced technology to generate electricity at a variety of frequencies depending on the wind speed, convert it to DC and then back to AC before sending it to the grid. Wind turbines range from 50 – 750 kW for utility scale turbines down to below 50 kW for residential use. On a scale of 1 (the lowest) to 7 (the highest), Class 3 and above (wind speeds of 13 mph or greater) are generally considered “good wind resource” according to the Wind Energy Development Programmatic EIS Information Center hosted by the Bureau of Land Management. According to the map below, published by NREL, 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 absence of year-round thermal loads which are needed for efficiency CHP operation. However, a mini-size CHP could be an option for Bloomfield School District to consider. The sizing and energy savings of the mini-size CHP require further study.

#### **7.4 Demand Response Curtailment**

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

Utility Curtailment is an agreement with the utility provider's regional transmission organization and an approved Curtailment Service Provider (CSP) to shed electrical load by either turning major equipment off or energizing all or part of a facility utilizing an emergency generator; therefore, reducing the electrical demand on the utility grid. This program is to benefit the utility company during high demand periods and 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 2014 through December 2014 the following table summarizes the electricity load profile for the building.

**Building Electric Load Profile**

| Peak Demand<br>kW | Min Demand<br>kW | Avg Demand<br>kW | Onsite<br>Generation<br>Y/N | Eligible?<br>Y/N |
|-------------------|------------------|------------------|-----------------------------|------------------|
| 94.1              | 80.6             | 85.6             | N                           | N                |

\*the demand is estimated from one month bill

This measure is not recommended due to the low demand usage.

## 8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for the Bloomfield School District at Fair View Elementary School.

The following projects should be considered for implementation:

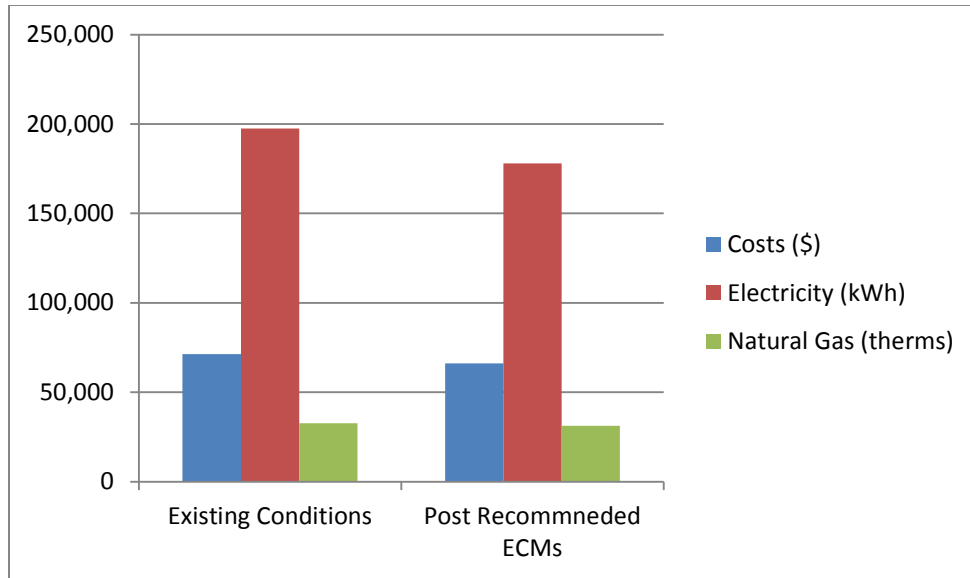
- Attic insulation
- Install Window AC Controller
- Lighting Replacements with Controls (Occupancy Sensors)

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

| <b>Electric Savings (kWh)</b> | <b>Natural Gas Savings (therms)</b> | <b>Total Savings (\$)</b> | <b>Payback (years)</b> |
|-------------------------------|-------------------------------------|---------------------------|------------------------|
| <b>19,546</b>                 | <b>1,378</b>                        | <b>\$5,021</b>            | <b>10.0</b>            |

If the Bloomfield School District implements the recommended ECMs, energy savings would be as follows:

|                       | <b>Existing Conditions</b> | <b>Post Recommended ECMs</b> | <b>Percent Savings</b> |
|-----------------------|----------------------------|------------------------------|------------------------|
| Costs (\$)            | 71,283                     | 66,262                       | 7%                     |
| Electricity (kWh)     | 197,542                    | 177,996                      | 10%                    |
| Natural Gas (therms)  | 32,659                     | 31,281                       | 4%                     |
| Site EUI (kbtu/SF/Yr) | 68.0                       | 64.5                         |                        |



Next Steps: This energy audit has identified several areas of potential energy savings. Bloomfield School District can use this information to pursue incentives offered by the NJBPU's NJ Clean Energy Program. A close-out meeting will be scheduled with school staff members to review the ECMs and possible incentive options.

## **APPENDIX A**

### **Utility Usage Analysis and Alternate Utility Suppliers**

**Fair View Elementary School**  
**376 Berkeley Avenue Bloomfield, NJ 07007**

**Annual Utilities**  
**12-month Summary**

| Electric         |         |           |
|------------------|---------|-----------|
| Annual Usage     | 197,542 | kWh/yr    |
| Annual Cost      | 37,314  | \$        |
| Blended Rate     | 0.189   | \$/kWh    |
| Consumption Rate | 0.152   | \$/kWh    |
| Demand Rate      | 7.08    | \$/kW     |
| Peak Demand      | 94.1    | kW        |
| Min. Demand      | 80.6    | kW        |
| Avg. Demand      | 85.6    | kW        |
| Natural Gas      |         |           |
| Annual Usage     | 32,659  | therms/yr |
| Annual Cost      | 33,969  | \$        |
| Rate             | 1.040   | \$/therm  |

**Fair View Elementary School**  
**376 Berkeley Avenue Bloomfield, NJ 07003**

**Utility Bills: Account Numbers**

| <b><u>Account Number</u></b> | <b><u>Building Name</u></b> | <b><u>Location</u></b>                   | <b><u>Type</u></b> | <b><u>Notes</u></b> |
|------------------------------|-----------------------------|------------------------------------------|--------------------|---------------------|
| 6978830100                   | Fair View Elementary School | 376 Berkeley Avenue Bloomfield, NJ 07003 | Electricity        |                     |
| 6979252518                   | Fair View Elementary School | 376 Berkeley Avenue Bloomfield, NJ 07003 | Electricity        |                     |
| 4269978121                   | Fair View Elementary School | 376 Berkeley Avenue Bloomfield, NJ 07003 | Natural Gas        |                     |

Fair View Elementary School  
376 Berkeley Avenue Bloomfield, NJ 07003

**For Service at:**

Account No.: Combined (see below)      Delivery - PSE&G  
Meter No.: Combined (see below)      Supplier - DIRECT ENERGY  
Electric Service

| Month                    |                   |              | Provider Charges   |                    |                    | Usage (kWh) vs. Demand (kW) Charges |                   | Unit Costs            |                      |                |
|--------------------------|-------------------|--------------|--------------------|--------------------|--------------------|-------------------------------------|-------------------|-----------------------|----------------------|----------------|
|                          | Consumption (kWh) | Demand (kW)  | Delivery (\$)      | Supplier (\$)      | Total (\$)         | Consumption (\$)                    | Demand (\$)       | Blended Rate (\$/kWh) | Consumption (\$/kWh) | Demand (\$/kW) |
| July '13                 | 11,265            | 88.70        | 1,549.66           | 1,347.22           | 2,896.88           | 1,812.58                            | 1,084.30          | 0.26                  | 0.16                 | 12.22          |
| August '13               | 9,126             | 88.10        | 1,455.58           | 1,112.85           | 2,568.43           | 1,491.47                            | 1,076.96          | 0.28                  | 0.16                 | 12.22          |
| September '13            | 11,415            | 98.20        | 1,671.89           | 1,376.14           | 3,048.03           | 1,847.59                            | 1,200.44          | 0.27                  | 0.16                 | 12.22          |
| October '13              | 22,346            | 82.70        | 1,124.08           | 2,549.35           | 3,673.43           | 3,319.43                            | 354.00            | 0.16                  | 0.15                 | 4.28           |
| November '13             | 17,713            | 82.70        | 967.20             | 2,069.89           | 3,037.09           | 2,683.09                            | 354.00            | 0.17                  | 0.15                 | 4.28           |
| December '13             | 18,833            | 82.70        | 1,005.43           | 2,192.19           | 3,197.62           | 2,843.62                            | 354.00            | 0.17                  | 0.15                 | 4.28           |
| January '14              | 14,137            | 80.60        | 825.08             | 1,709.80           | 2,534.88           | 2,189.88                            | 345.00            | 0.18                  | 0.15                 | 4.28           |
| February '14             | 17,246            | 86.10        | 935.45             | 2,092.49           | 3,027.94           | 2,659.39                            | 368.55            | 0.18                  | 0.15                 | 4.28           |
| March '14                | 17,809            | 90.10        | 970.60             | 2,012.42           | 2,983.02           | 2,597.35                            | 385.67            | 0.17                  | 0.15                 | 4.28           |
| April '14                | 18,668            | 85.90        | 980.29             | 2,096.42           | 3,076.71           | 2,709.01                            | 367.70            | 0.16                  | 0.15                 | 4.28           |
| May '14                  | 17,252            | 82.90        | 921.62             | 1,937.40           | 2,859.02           | 2,504.17                            | 354.85            | 0.17                  | 0.15                 | 4.28           |
| June '14                 | 21,732            | 94.10        | 1,970.33           | 2,440.50           | 4,410.83           | 3,274.44                            | 1,136.39          | 0.20                  | 0.15                 | 12.08          |
| <b>Total (All)</b>       | <b>197,542</b>    | <b>98.20</b> | <b>\$14,377.21</b> | <b>\$22,936.66</b> | <b>\$37,313.87</b> | <b>\$29,932.01</b>                  | <b>\$7,381.86</b> | <b>\$0.19</b>         | <b>\$0.15</b>        | <b>\$7.08</b>  |
| <b>Total (12 Months)</b> | <b>197,542</b>    | <b>94.10</b> | <b>\$14,377.21</b> | <b>\$22,936.66</b> | <b>\$37,313.87</b> | <b>\$29,932.01</b>                  | <b>\$7,381.86</b> | <b>\$0.19</b>         | <b>\$0.15</b>        | <b>\$7.08</b>  |
| Notes                    | 1                 | 2            | 3                  | 4                  | 5                  | 6                                   | 7                 | 8                     | 9                    | 10             |

Based on Direct Energy bills, amounts for Supplier \$ are calculated as follows:  
 July '13 thru Oct '13 - \$0.1092/KWH + KW Demand x \$1.32  
 Nov '13 and Dec '13 - \$0.1092/KWH + KW Demand x \$1.64  
 Jan '14 - \$0.1092/KWH + KW Demand x \$2.06  
 Feb '14 - \$0.1092/KWH + KW Demand x \$2.43  
 March '14 - \$0.1092/KWH + Trans. Adj. \$0.0038/KWH  
 Apr '14 thru June '14 - \$0.1092/KWH + Trans. Adj. \$0.0031/KWH

94.1 Max  
80.6 Min  
85.6 average

Fair View Elementary School  
376 Berkeley Avenue Bloomfield, NJ 07003

**For Service at:**

Account No.: 6504638004  
Meter No.: 728007761

Electric Service

Delivery - PSE&G  
Supplier - DIRECT ENERGY

| Month                    |                   |              | Provider Charges   |                    |                    | Usage (kWh) vs. Demand (kW) Charges |                   | Unit Costs            |                      |                |
|--------------------------|-------------------|--------------|--------------------|--------------------|--------------------|-------------------------------------|-------------------|-----------------------|----------------------|----------------|
|                          | Consumption (kWh) | Demand (kW)  | Delivery (\$)      | Supplier (\$)      | Total (\$)         | Consumption (\$)                    | Demand (\$)       | Blended Rate (\$/kWh) | Consumption (\$/kWh) | Demand (\$/kW) |
| July '13                 | 11,200            | 88.00        | 1,534.20           | 1,339.20           | 2,873.40           | 1,797.66                            | 1,075.74          | 0.26                  | 0.16                 | 12.22          |
| August '13               | 9,120             | 88.00        | 1,449.85           | 1,112.06           | 2,561.91           | 1,486.17                            | 1,075.74          | 0.28                  | 0.16                 | 12.22          |
| September '13            | 11,360            | 97.60        | 1,658.05           | 1,369.34           | 3,027.39           | 1,834.29                            | 1,193.10          | 0.27                  | 0.16                 | 12.22          |
| October '13              | 22,240            | 81.60        | 1,111.50           | 2,536.32           | 3,647.82           | 3,298.53                            | 349.29            | 0.16                  | 0.15                 | 4.28           |
| November '13             | 17,600            | 81.60        | 954.36             | 2,055.74           | 3,010.10           | 2,660.81                            | 349.29            | 0.17                  | 0.15                 | 4.28           |
| December '13             | 18,720            | 81.60        | 992.59             | 2,178.05           | 3,170.64           | 2,821.35                            | 349.29            | 0.17                  | 0.15                 | 4.28           |
| January '14              | 14,080            | 80.00        | 816.36             | 1,702.34           | 2,518.70           | 2,176.26                            | 342.44            | 0.18                  | 0.15                 | 4.28           |
| February '14             | 17,120            | 84.80        | 921.54             | 2,075.57           | 2,997.11           | 2,634.12                            | 362.99            | 0.18                  | 0.15                 | 4.28           |
| March '14                | 17,760            | 89.60        | 962.61             | 2,006.88           | 2,969.49           | 2,585.96                            | 383.53            | 0.17                  | 0.15                 | 4.28           |
| April '14                | 18,560            | 84.80        | 967.81             | 2,084.29           | 3,052.10           | 2,689.11                            | 362.99            | 0.16                  | 0.14                 | 4.28           |
| May '14                  | 17,120            | 81.60        | 907.51             | 1,922.58           | 2,830.09           | 2,480.80                            | 349.29            | 0.17                  | 0.14                 | 4.28           |
| June '14                 | 21,600            | 92.80        | 1,956.22           | 2,425.68           | 4,381.90           | 3,251.07                            | 1,130.83          | 0.20                  | 0.15                 | 12.19          |
| <b>Total (All)</b>       | <b>196,480</b>    | <b>97.60</b> | <b>\$14,232.60</b> | <b>\$22,808.05</b> | <b>\$37,040.65</b> | <b>\$29,716.13</b>                  | <b>\$7,324.52</b> | <b>\$0.19</b>         | <b>\$0.15</b>        | <b>\$7.10</b>  |
| <b>Total (12 Months)</b> | <b>106,240</b>    | <b>92.80</b> | <b>\$6,532.05</b>  | <b>\$12,217.33</b> | <b>\$18,749.38</b> | <b>\$15,817.31</b>                  | <b>\$2,932.07</b> | <b>\$0.18</b>         | <b>\$0.15</b>        | <b>\$5.71</b>  |
| Notes                    | 1                 | 2            | 3                  | 4                  | 5                  | 6                                   | 7                 | 8                     | 9                    | 10             |

Based on Direct Energy bills, amounts for Supplier \$ are calculated as follows:

July '13 thru Oct '13 - \$0.1092/KWH + KW Demand x \$1.32

Nov '13 and Dec '13 - \$0.1092/KWH + KW Demand x \$1.64

Jan '14 - \$0.1092/KWH + KW Demand x \$2.06

Feb '14 - \$0.1092/KWH + KW Demand x \$2.43

March '14 - \$0.1092/KWH + Trans. Adj. \$0.0038/KWH

Apr '14 thru June '14 - \$0.1092/KWH + Trans. Adj. \$0.0031/KWH

Fair View Elementary School  
376 Berkeley Avenue Bloomfield, NJ 07003

For Service at:  
Account No.:  
Meter No.:  
Electric Service

6699086502  
126296596

Delivery - PSE&G  
Supplier - DIRECT ENERGY

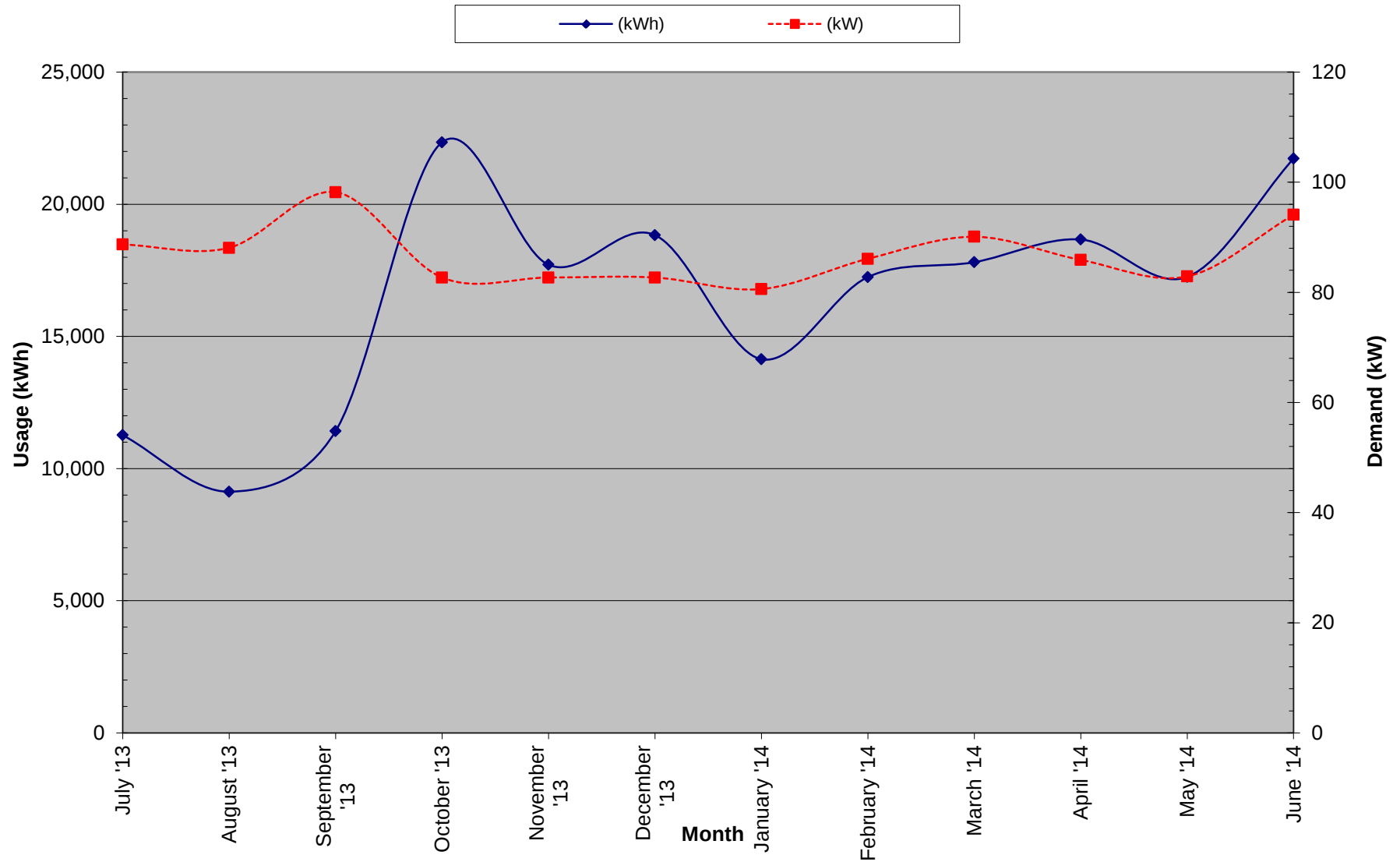
| Month                    |                   |             | Provider Charges |                 |                 | Usage (kWh) vs. Demand (kW) Charges |                | Unit Costs            |                      |                |
|--------------------------|-------------------|-------------|------------------|-----------------|-----------------|-------------------------------------|----------------|-----------------------|----------------------|----------------|
|                          | Consumption (kWh) | Demand (kW) | Delivery (\$)    | Supplier (\$)   | Total (\$)      | Consumption (\$)                    | Demand (\$)    | Blended Rate (\$/kWh) | Consumption (\$/kWh) | Demand (\$/kW) |
| July '13                 | 65                | 0.70        | 15.46            | 8.02            | 23.48           | 14.92                               | 8.56           | 0.36                  | 0.23                 | 12.23          |
| August '13               | 6                 | 0.10        | 5.73             | 0.79            | 6.52            | 5.30                                | 1.22           | 1.09                  | 0.88                 | 12.20          |
| September '13            | 55                | 0.60        | 13.84            | 6.80            | 20.64           | 13.30                               | 7.34           | 0.38                  | 0.24                 | 12.23          |
| October '13              | 106               | 1.10        | 12.58            | 13.03           | 25.61           | 20.90                               | 4.71           | 0.24                  | 0.20                 | 4.28           |
| November '13             | 113               | 1.10        | 12.84            | 14.14           | 26.98           | 22.27                               | 4.71           | 0.24                  | 0.20                 | 4.28           |
| December '13             | 113               | 1.10        | 12.84            | 14.14           | 26.98           | 22.27                               | 4.71           | 0.24                  | 0.20                 | 4.28           |
| January '14              | 57                | 0.60        | 8.72             | 7.46            | 16.18           | 13.62                               | 2.56           | 0.28                  | 0.24                 | 4.27           |
| February '14             | 126               | 1.30        | 13.91            | 16.92           | 30.83           | 25.27                               | 5.56           | 0.24                  | 0.20                 | 4.28           |
| March '14                | 49                | 0.50        | 7.99             | 5.54            | 13.53           | 11.39                               | 2.14           | 0.28                  | 0.23                 | 4.28           |
| April '14                | 108               | 1.10        | 12.48            | 12.13           | 24.61           | 19.90                               | 4.71           | 0.23                  | 0.18                 | 4.28           |
| May '14                  | 132               | 1.30        | 14.11            | 14.82           | 28.93           | 23.37                               | 5.56           | 0.22                  | 0.18                 | 4.28           |
| June '14                 | 132               | 1.30        | 14.11            | 14.82           | 28.93           | 23.37                               | 5.56           | 0.22                  | 0.18                 | 4.28           |
| <b>Total (All)</b>       | <b>1,062</b>      | <b>1.30</b> | <b>\$144.61</b>  | <b>\$128.61</b> | <b>\$273.22</b> | <b>\$215.88</b>                     | <b>\$57.34</b> | <b>\$0.26</b>         | <b>\$0.20</b>        | <b>\$5.31</b>  |
| <b>Total (12 Months)</b> | <b>604</b>        | <b>1.30</b> | <b>\$71.32</b>   | <b>\$71.69</b>  | <b>\$143.01</b> | <b>\$116.92</b>                     | <b>\$26.09</b> | <b>\$0.24</b>         | <b>\$0.19</b>        | <b>\$4.28</b>  |
| Notes                    | 1                 | 2           | 3                | 4               | 5               | 6                                   | 7              | 8                     | 9                    | 10             |

1.) Based on Direct Energy bills, amounts for Supplier \$ are calculated as follows:

July '13 thru Oct '13 - \$0.1092/KWH + KW Demand x \$1.32  
Nov '13 and Dec '13 - \$0.1092/KWH + KW Demand x \$1.64  
Jan '14 - \$0.1092/KWH + KW Demand x \$2.06  
Feb '14 - \$0.1092/KWH + KW Demand x \$2.43  
March '14 - \$0.1092/KWH + Trans. Adj. \$0.0038/KWH  
Apr '14 thru June '14 - \$0.1092/KWH + Trans. Adj. \$0.0031/KWH

2) Data for June '14 is estimated since bill was not available.

### Electric Usage - Fair View Elementary School



Fair View Elementary School  
376 Berkeley Avenue Bloomfield, NJ 07003

For Service at:

Account No.: 6504638004

Meter No: 2413547

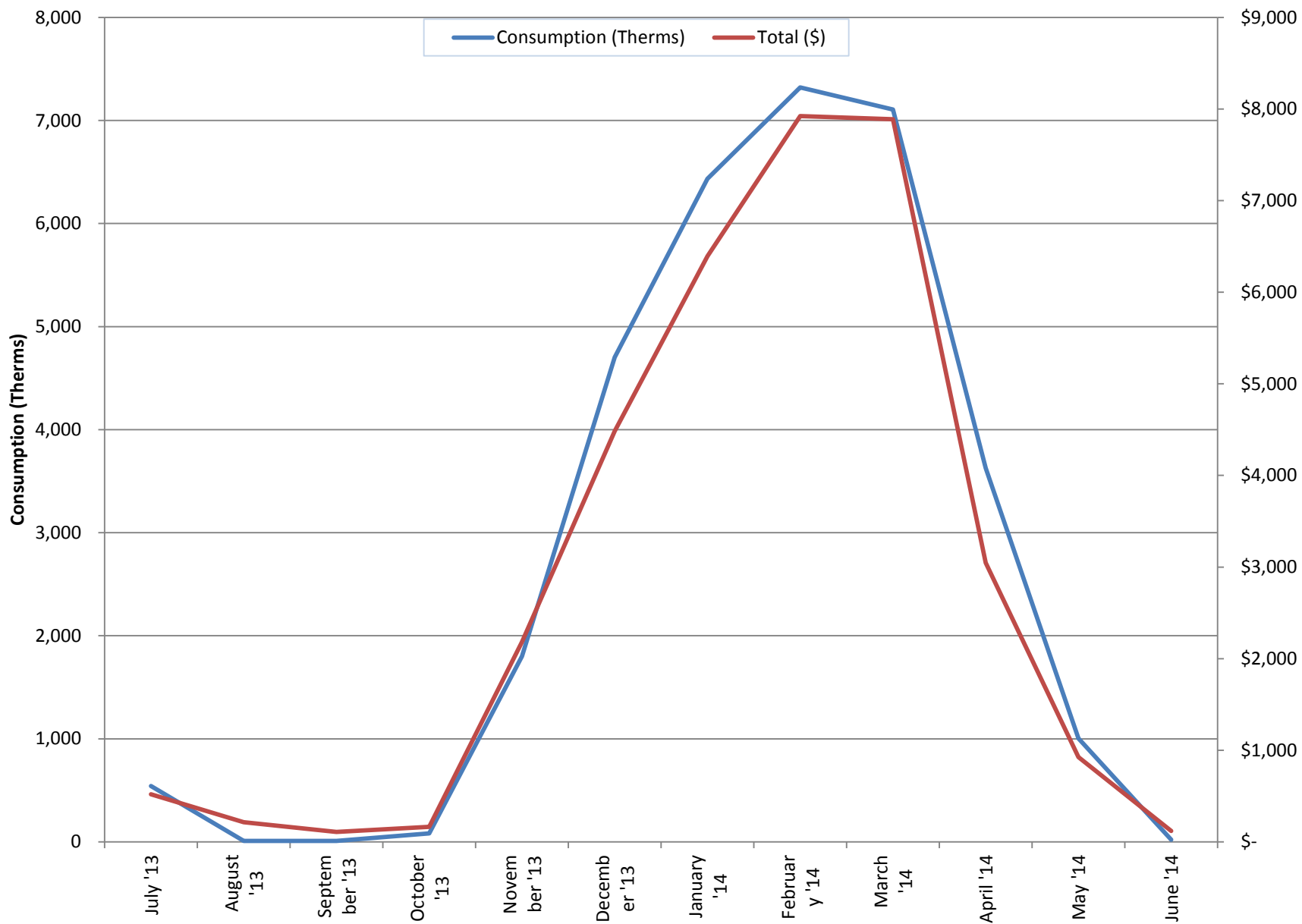
Natural Gas Service

Delivery - PSE&G

Supplier - PSE&G

| Month                     | Consumption<br>(Therms) | Charges          |                |                     | Unit Costs             |                      |                     |
|---------------------------|-------------------------|------------------|----------------|---------------------|------------------------|----------------------|---------------------|
|                           |                         | Delivery<br>(\$) | Supply<br>(\$) | Total<br>(\$)       | Delivery<br>(\$/Therm) | Supply<br>(\$/Therm) | Total<br>(\$/Therm) |
| July '13                  | 542                     | \$ 182           | \$ 337         | \$ 519              | \$ 0.34                | \$ 0.62              | \$ 0.96             |
| August '13                | 8                       | \$ 210           | \$ 4           | \$ 214              | \$ 26.25               | \$ 0.50              | \$ 26.75            |
| September '13             | 8                       | \$ 105           | \$ 4           | \$ 109              | \$ 13.13               | \$ -                 | \$ 13.63            |
| October '13               | 83                      | \$ 116           | \$ 47          | \$ 163              | \$ 1.40                | \$ -                 | \$ 1.96             |
| November '13              | 1,800                   | \$ 1,173         | \$ 1,010       | \$ 2,183            | \$ 0.65                | \$ 0.56              | \$ 1.21             |
| December '13              | 4,703                   | \$ 1,793         | \$ 2,692       | \$ 4,485            | \$ 0.38                | \$ 0.57              | \$ 0.95             |
| January '14               | 6,435                   | \$ 2,303         | \$ 4,090       | \$ 6,393            | \$ 0.36                | \$ 0.64              | \$ 0.99             |
| February '14              | 7,322                   | \$ 2,455         | \$ 5,469       | \$ 7,924            | \$ 0.34                | \$ 0.75              | \$ 1.08             |
| March '14                 | 7,107                   | \$ 2,394         | \$ 5,496       | \$ 7,890            | \$ 0.34                | \$ 0.77              | \$ 1.11             |
| April '14                 | 3,628                   | \$ 470           | \$ 2,577       | \$ 3,047            | \$ 0.13                | \$ 0.71              | \$ 0.84             |
| May '14                   | 1,003                   | \$ 227           | \$ 697         | \$ 924              | \$ 0.23                | \$ 0.69              | \$ 0.92             |
| June '14                  | 20                      | \$ 104           | \$ 14          | \$ 118              | \$ 5.20                | \$ 0.70              | \$ 5.90             |
| <b>Total (12 - Month)</b> | <b>32,659</b>           |                  |                | <b>\$ 33,969.00</b> |                        |                      | <b>\$ 1.040</b>     |
| <b>Total (12 Months)</b>  | <b>32,659.00</b>        |                  |                | <b>33,969.00</b>    |                        |                      | <b>\$ 1.040</b>     |

# Natural Gas Usage - Fair View Elementary School



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[Back to the main supplier page](#)

## **APPENDIX B**

### **Equipment Inventory**

CHA Project # 30040  
Fair View Elementary School  
376 Berkeley Avenue Bloomfield, NJ 07003

[illegible]

## **APPENDIX C**

### **ECM Calculations**

Bloomfield School District  
CHA Project Number: 30040

Rate of Discount (used for NPV) 5.0%

| Utility Costs            | Yearly Usage | Electricity Cost<br>(Source: Energy<br>Department) | Building Area | Annual Utility Cost |
|--------------------------|--------------|----------------------------------------------------|---------------|---------------------|
| \$ 0.189 Btu/kWh blended | 0.00042026   | 57,950                                             | Electric      | Natural Gas         |
| \$ 0.152 Btu/kWh supply  | 197,542      | 0.00042026                                         |               | Fuel Oil            |
| \$ 7.09 Btu/kWh          | 94.1         | 0                                                  |               |                     |
| \$ 1.04 Btu/kWh          | 32,659       | 0.0003471                                          |               |                     |
| \$ -- Btu/kWh            | 0            | 0                                                  |               |                     |
| Estimated                | Btu/kWh      |                                                    |               |                     |

| Fair View Elementary School                    |        |        |                                                         |        |        |       |               |            |           |            |                |                 |                                          |                           |                               |                       |                                   |         |         |   |            |        |             |             |        |
|------------------------------------------------|--------|--------|---------------------------------------------------------|--------|--------|-------|---------------|------------|-----------|------------|----------------|-----------------|------------------------------------------|---------------------------|-------------------------------|-----------------------|-----------------------------------|---------|---------|---|------------|--------|-------------|-------------|--------|
| Recommend?                                     | Y or N | Item   | Savings                                                 |        |        |       |               |            | Cost      |            | Simple Payback | Life Expectancy | Equivalent CO <sub>2</sub> (Metric tons) | N2 Smart Start Incentives | Direct Install (Chiller 100%) | Payback of Incentives | Simple Projected Lifetime Savings |         |         |   | ROI        | NPV    | IRR         |             |        |
|                                                |        |        | kWh                                                     | 0      | kWh    | 0     | No. 2 Oil out | Water used | \$        | \$         |                |                 |                                          |                           |                               |                       | kWh                               | 0       | kWh     | 0 |            |        |             | kWh         | 0      |
|                                                | Y      | ECM-1  | Window Replacement                                      | 0.0    | 0      | 551   | 0             | 0          | 573       | \$ 46,900  | 81.8           | 25              | 2.9                                      | \$ 13,785                 | 0                             | 0                     | 0                                 | 0       | 0       | 0 | 0          | 14,337 | (0.7)       | (\$36,914)  | -7.6%  |
|                                                | Y      | ECM-2  | Add Attic Insulation                                    | 0.0    | 870    | 1,378 | 0             | 0          | 1,598     | \$ 23,200  | 14.5           | 15              | 7.7                                      | \$ 0                      | N                             | 14.5                  | 0.0                               | 13,054  | 20,670  | 0 | 0          | 23,964 | 0.0         | (\$4,129)   | 0.4%   |
|                                                | N      | ECM-3  | Boiler Replacement                                      | 0.0    | 0      | 4,375 | 0             | 0          | 4,550     | \$ 245,157 | 53.9           | 15              | 23.3                                     | \$ 5,600                  | N                             | 52.7                  | 0.0                               | 0       | 65,620  | 0 | 0          | 68,245 | (0.7)       | (\$185,244) | -12.7% |
|                                                | Y      | ECM-4  | Install Window AC Controller                            | 0.0    | 1,595  | 0     | 0             | 0          | 301       | \$ 1,040   | 3.4            | 15              | 0.7                                      | \$ 0                      | N                             | 3.4                   | 0.0                               | 23,928  | 0       | 0 | 0          | 4,522  | 3.3         | \$2,959     | 28.9%  |
|                                                | N      | ECM-L1 | Lighting Replacements / Upgrades                        | 6      | 13,975 | 0     | 0             | 0          | 2,650     | \$ 20,785  | 7.8            | 15              | 5.9                                      | \$ 2,650                  | N                             | 6.8                   | 92.9                              | 289,631 | 0       | 0 | 0          | 47,509 | 1.3         | \$13,882    | 11.9%  |
|                                                | N      | ECM-L2 | Install Lighting Controls (Add Occupancy Sensors)       | 0      | 4,776  | 0     | 0             | 0          | 726       | \$ 5,130   | 7.1            | 15              | 2.0                                      | \$ 726                    | N                             | 6.1                   | 0.0                               | 71,640  | 0       | 0 | 0          | 13,540 | 1.6         | \$4,262     | 14.2%  |
|                                                | Y      | ECM-L3 | Lighting Replacements with Controls (Occupancy Sensors) | 6      | 17,081 | 0     | 0             | 0          | 3,122     | \$ 25,915  | 8.3            | 15              | 7.2                                      | \$ 3,122                  | N                             | 7.3                   | 92.9                              | 256,215 | 0       | 0 | 0          | 56,313 | 1.2         | \$14,480    | 10.7%  |
| Total                                          |        |        | 6.2                                                     | 19,546 | 6,384  | 0     | 0             | 0          | \$ 10,144 | \$ 342,212 | 33.7           | 17.8            | 42                                       | \$ 8,722                  |                               | 32.9                  | 93                                | 293,197 | 180,875 | - | \$ 167,381 | (0.5)  | (\$209,247) | -6.5%       |        |
| Recommended Measures (highlighted green above) |        |        | 6.2                                                     | 19,546 | 1,378  | 0     | 0             | 0          | \$ 5,821  | \$ 56,135  | 10.8           | 15.8            | 16                                       | \$ 3,122                  | 0                             | 9.4                   | 93                                | 293,197 | 28,678  | - | \$ 84,799  | 0.7    | 12,811      | 6.6%        |        |
| % of Existing                                  |        |        | 7%                                                      | 10%    | 4%     | 0     | 0             | 0          |           |            |                |                 |                                          |                           |                               |                       |                                   |         |         |   |            |        |             |             |        |

| City:               |                        | Newark NJ |                   |                   |                   |                   |                   |
|---------------------|------------------------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Occupied Hours/Week |                        | 80        |                   |                   |                   |                   |                   |
| Temp                | Enthalpy<br>h (Btu/lb) | Bin Hours | Building          | Auditorium        | Gymnasium         | Library           | Classrooms        |
|                     |                        |           | Operatin<br>Hours | Occupied<br>Hours | Occupied<br>Hours | Occupied<br>Hours | Occupied<br>Hours |
| 102.5               | 95.5                   | 0         | 0                 | 0                 | 0                 | 0                 | 0                 |
| 97.5                | 97.4                   | 31        | 11                | 0                 | 0                 | 0                 | 0                 |
| 92.5                | 95.0                   | 131       | 47                | 0                 | 0                 | 0                 | 0                 |
| 87.5                | 93.0                   | 305       | 178               | 0                 | 0                 | 0                 | 0                 |
| 82.5                | 91.5                   | 820       | 221               | 0                 | 0                 | 0                 | 0                 |
| 77.5                | 89.9                   | 854       | 237               | 0                 | 0                 | 0                 | 0                 |
| 72.5                | 87.2                   | 864       | 246               | 0                 | 0                 | 0                 | 0                 |
| 67.5                | 84.0                   | 927       | 281               | 0                 | 0                 | 0                 | 0                 |
| 62.5                | 80.9                   | 950       | 214               | 0                 | 0                 | 0                 | 0                 |
| 57.5                | 78.2                   | 775       | 231               | 0                 | 0                 | 0                 | 0                 |
| 52.5                | 74.9                   | 491       | 175               | 0                 | 0                 | 0                 | 0                 |
| 47.5                | 71.5                   | 650       | 234               | 0                 | 0                 | 0                 | 0                 |
| 42.5                | 68.2                   | 1,053     | 365               | 0                 | 0                 | 0                 | 0                 |
| 37.5                | 64.9                   | 234       | 118               | 0                 | 0                 | 0                 | 0                 |
| 32.5                | 61.5                   | 234       | 118               | 0                 | 0                 | 0                 | 0                 |
| 27.5                | 58.2                   | 42        | 17                | 0                 | 0                 | 0                 | 0                 |
| 22.5                | 54.9                   | 34        | 12                | 0                 | 0                 | 0                 | 0                 |
| 17.5                | 51.5                   | 0         | 0                 | 0                 | 0                 | 0                 | 0                 |
| 12.5                | 48.2                   | 0         | 0                 | 0                 | 0                 | 0                 | 0                 |
| 7.5                 | 44.9                   | 0         | 0                 | 0                 | 0                 | 0                 | 0                 |
| 2.5                 | 41.5                   | 0         | 0                 | 0                 | 0                 | 0                 | 0                 |
| -2.5                | 38.2                   | 0         | 0                 | 0                 | 0                 | 0                 | 0                 |
| -7.5                | 34.9                   | 0         | 0                 | 0                 | 0                 | 0                 | 0                 |

| Multipliers |      |
|-------------|------|
| Material    | 1.07 |
| Labor       | 1.34 |
| Equipment   | 1.13 |

|                           |     |
|---------------------------|-----|
| Heating System Efficiency | 79% |
| Cooling Eff (R/Wtr)       | 1.2 |

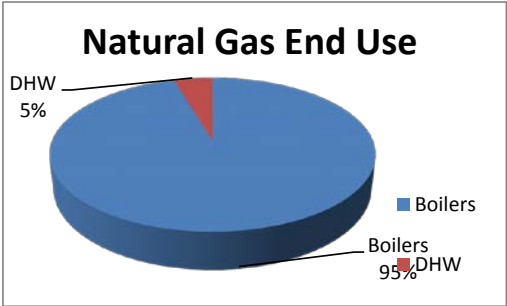
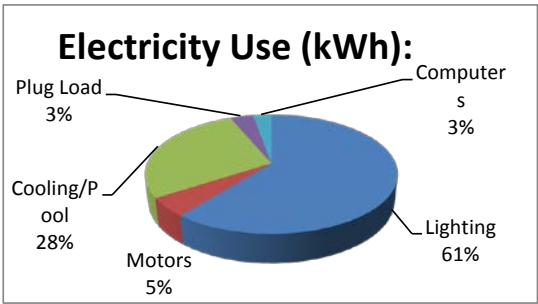
| Heating      |           |
|--------------|-----------|
| Hours        | 4,677 Hrs |
| Weighted Avg | 48 F      |
| Avg          | 74 F      |
| Cooling      |           |
| Hours        | 4,311 Hrs |
| Weighted Avg | 61 F      |
| Avg          | 74 F      |

Bloomfield School District  
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| Utility End Use Analysis  |              |                                      |
|---------------------------|--------------|--------------------------------------|
| Electricity Use (kWh):    |              | Notes/Comments:                      |
| 197,542                   | Total        | Based on utility analysis            |
| 120,000                   | Lighting     | From Lighting Calculations           |
| 10,000                    | Motors       | Estimated                            |
| 55,000                    | Cooling/Pool | Estimated from AC capacity and calcs |
| 7,000                     | Plug Load    | Estimated                            |
| 5,542                     | Computers    | Estimated                            |
|                           |              |                                      |
| Natural Gas Use (Therms): |              | Notes/Comments:                      |
| 32,659                    | Total        | Based on utility analysis            |
| 31,159                    | Boilers      | Estimated                            |
| 1,500                     | DHW          | Based on utility analysis            |

61%  
 5%  
 28%  
 4%  
 3%  
 0%  
 100%

95%  
 5%



Bloomfield School District  
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Note: pricing is for energy calculations only -do not use for procurement

ECM-1 Window Replacement

Existing: The first and second floors have single pane windows which lead to large amount of the heating/cooling loss. Replacing these old windows with high heat resistance double pane windows will help reduce the energy loss and save energy.  
Proposed: Replace single pane windows with double windows.

|                              |                |                                 |             |                           |                  |
|------------------------------|----------------|---------------------------------|-------------|---------------------------|------------------|
| Linear Feet of panel Edge    | 972.0 LF       | Cooling System Efficiency       | 0 kW/ton    | Heating System Efficiency | 75%              |
| Area of Panel                | 324.0 SF       | Ex Occupied Cing Temp.          | 72 °F       | Heating On Temp.          | 55 °F            |
| Existing Infiltration Factor | 0.20 cfm/LF    | Ex Unoccupied Cing Temp.        | 72 °F       | Ex Occupied Htg Temp.     | 72 °F            |
| Proposed Infiltration Factor | 0.10 cfm/LF    | Cooling Occ Enthalpy Setpoint   | 27.5 Btu/lb | Ex Unoccupied Htg Temp.   | 72 °F            |
| Existing U Value             | 1.00 Btuh/SF°F | Cooling Unocc Enthalpy Setpoint | 27.5 Btu/lb | Electricity               | \$ 0.189 \$/kWh  |
| Proposed U Value             | 0.60 Btuh/SF°F |                                 |             | Natural Gas               | \$ 1.04 \$/therm |

|                                     |                             |     |                                    |                                    |                                      | EXISTING LOADS                       |                                      | PROPOSED LOADS                       |                                      | COOLING ENERGY                       |                                      | HEATING ENERGY                       |                                         |
|-------------------------------------|-----------------------------|-----|------------------------------------|------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-----------------------------------------|
| Avg Outdoor<br>Air Temp. Bins<br>°F | Avg Outdoor Air<br>Enthalpy | Air | Existing<br>Equipment Bin<br>Hours | Occupied<br>Equipment Bin<br>Hours | Unoccupied<br>Equipment Bin<br>Hours | Occupied                             | Unoccupied                           | Occupied                             | Unoccupied                           | Existing<br>Cooling<br>Energy<br>kWh | Proposed<br>Cooling<br>Energy<br>kWh | Existing<br>Heating Energy<br>Therms | Proposed<br>Heating<br>Energy<br>Therms |
|                                     |                             |     |                                    |                                    |                                      | Panel<br>Infiltration &<br>Heat Load | Panel<br>Infiltration &<br>Heat Load | Panel<br>Infiltration &<br>Heat Load | Panel<br>Infiltration &<br>Heat Load |                                      |                                      |                                      |                                         |
|                                     |                             |     |                                    |                                    |                                      | BTUH                                 | BTUH                                 | BTUH                                 | BTUH                                 |                                      |                                      |                                      |                                         |
| A                                   |                             |     | B                                  | C                                  | D                                    | E                                    | F                                    | G                                    | H                                    | I                                    | J                                    | K                                    | L                                       |
| 102.5                               | 50.1                        |     | 0                                  | 0                                  | 0                                    | -29,652                              | -29,652                              | -15,814                              | -15,814                              | 0                                    | 0                                    | 0                                    | 0                                       |
| 97.5                                | 42.5                        |     | 6                                  | 2                                  | 4                                    | -21,384                              | -21,384                              | -11,518                              | -11,518                              | 0                                    | 0                                    | 0                                    | 0                                       |
| 92.5                                | 39.5                        |     | 45                                 | 16                                 | 29                                   | -17,140                              | -17,140                              | -9,234                               | -9,234                               | 0                                    | 0                                    | 0                                    | 0                                       |
| 87.5                                | 36.6                        |     | 146                                | 52                                 | 94                                   | -12,983                              | -12,983                              | -6,994                               | -6,994                               | 0                                    | 0                                    | 0                                    | 0                                       |
| 82.5                                | 34.0                        |     | 298                                | 106                                | 192                                  | -9,088                               | -9,088                               | -4,884                               | -4,884                               | 0                                    | 0                                    | 0                                    | 0                                       |
| 77.5                                | 31.6                        |     | 476                                | 170                                | 306                                  | -5,369                               | -5,369                               | -2,863                               | -2,863                               | 0                                    | 0                                    | 0                                    | 0                                       |
| 72.5                                | 29.2                        |     | 662                                | 237                                | 426                                  | -1,649                               | -1,649                               | -841                                 | -841                                 | 0                                    | 0                                    | 0                                    | 0                                       |
| 67.5                                | 27.0                        |     | 740                                | 264                                | 476                                  | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                       |
| 62.5                                | 24.5                        |     | 765                                | 273                                | 492                                  | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                       |
| 57.5                                | 21.4                        |     | 733                                | 262                                | 471                                  | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                    | 0                                       |
| 52.5                                | 18.7                        |     | 668                                | 239                                | 430                                  | 10,412                               | 10,412                               | 5,838                                | 5,838                                | 0                                    | 0                                    | 93                                   | 52                                      |
| 47.5                                | 16.2                        |     | 659                                | 235                                | 424                                  | 13,082                               | 13,082                               | 7,335                                | 7,335                                | 0                                    | 0                                    | 115                                  | 64                                      |
| 42.5                                | 14.4                        |     | 685                                | 245                                | 441                                  | 15,752                               | 15,752                               | 8,832                                | 8,832                                | 0                                    | 0                                    | 144                                  | 81                                      |
| 37.5                                | 12.6                        |     | 739                                | 264                                | 475                                  | 18,421                               | 18,421                               | 10,328                               | 10,328                               | 0                                    | 0                                    | 182                                  | 102                                     |
| 32.5                                | 10.7                        |     | 717                                | 256                                | 461                                  | 21,091                               | 21,091                               | 11,825                               | 11,825                               | 0                                    | 0                                    | 202                                  | 113                                     |
| 27.5                                | 8.6                         |     | 543                                | 194                                | 349                                  | 23,761                               | 23,761                               | 13,322                               | 13,322                               | 0                                    | 0                                    | 172                                  | 96                                      |
| 22.5                                | 6.8                         |     | 318                                | 114                                | 205                                  | 26,431                               | 26,431                               | 14,819                               | 14,819                               | 0                                    | 0                                    | 112                                  | 63                                      |
| 17.5                                | 5.5                         |     | 245                                | 88                                 | 158                                  | 29,100                               | 29,100                               | 16,316                               | 16,316                               | 0                                    | 0                                    | 95                                   | 53                                      |
| 12.5                                | 4.1                         |     | 156                                | 56                                 | 100                                  | 31,770                               | 31,770                               | 17,813                               | 17,813                               | 0                                    | 0                                    | 66                                   | 37                                      |
| 7.5                                 | 2.6                         |     | 92                                 | 33                                 | 59                                   | 34,440                               | 34,440                               | 19,310                               | 19,310                               | 0                                    | 0                                    | 42                                   | 24                                      |
| 2.5                                 | 1.0                         |     | 36                                 | 13                                 | 23                                   | 37,110                               | 37,110                               | 20,807                               | 20,807                               | 0                                    | 0                                    | 18                                   | 10                                      |
| -2.5                                | 0.0                         |     | 19                                 | 7                                  | 12                                   | 39,779                               | 39,779                               | 22,304                               | 22,304                               | 0                                    | 0                                    | 10                                   | 6                                       |
| -7.5                                | -1.5                        |     | 8                                  | 3                                  | 5                                    | 42,449                               | 42,449                               | 23,800                               | 23,800                               | 0                                    | 0                                    | 5                                    | 3                                       |
| TOTALS                              |                             |     | 8,760                              | 3,129                              | 5,631                                |                                      |                                      |                                      |                                      | 0                                    | 0                                    | 1,255                                | 704                                     |

|                              |             |         |            |        |
|------------------------------|-------------|---------|------------|--------|
| Existing Panel Infiltration  | 194 cfm     | Savings | 551 Therms | \$ 573 |
| Existing Panel Heat Transfer | 324 Btuh/°F |         | 0 kWh      | \$ -   |
| Proposed Panel Infiltration  | 97 cfm      |         |            | \$ 573 |
| Proposed Panel Heat Transfer | 194 Btuh/°F |         |            |        |

| Panel ID | Location  | Quantity | Width<br>(ft) | Height<br>(ft) | Linear Feet (LF) | Area (SF) | Infiltration Rate<br>(CFM/LF) | U Value<br>(Btuh/SF°F) | Infiltration<br>(CFM) | Heat Transfer<br>(Btuh/°F) |
|----------|-----------|----------|---------------|----------------|------------------|-----------|-------------------------------|------------------------|-----------------------|----------------------------|
| 1        | 1st floor | 81       | 2             | 1              | 486.0            | 162.0     | 0.2                           | 1                      | 97.2                  | 162.0                      |
| 1        | 2nd floor | 81       | 2             | 1              | 486.0            | 162.0     | 0.2                           | 1                      | 97.2                  | 162.0                      |
| Total    |           | 162      |               |                | 972              | 324       | 0.20                          | 1.00                   | 194.4                 | 324                        |

|             |      |
|-------------|------|
| Multipliers |      |
| Material:   | 1.10 |
| Labor:      | 1.35 |
| Equipment:  | 1.10 |

**ECM-1 Window Replacement - Cost**

| Description        | QTY | UNIT | UNIT COSTS |       |        | SUBTOTAL COSTS |           |        | TOTAL COST | REMARKS           |
|--------------------|-----|------|------------|-------|--------|----------------|-----------|--------|------------|-------------------|
|                    |     |      | MAT.       | LABOR | EQUIP. | MAT.           | LABOR     | EQUIP. |            |                   |
| Window Replacement | 324 | sqft | \$ 65      | \$ 40 | \$ -   | \$ 21,060      | \$ 12,960 | \$ -   | \$ 34,020  | Vendor Est per SF |
|                    |     |      |            |       |        |                |           |        |            |                   |

Cost estimated are for Energy Savings only- do not use for procurement

|                  |                     |
|------------------|---------------------|
| \$ 34,020        | Subtotal            |
| \$ 5,103         | 15% Contingency     |
| \$ 7,825         | 20% Contractor O&P  |
| \$ -             | 0% Engineering Fees |
| <b>\$ 46,900</b> | <b>Total</b>        |

Bloomfield School District  
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Fair View Elementary School

ECM-2 Add Attic Insulation

Description: There is an attic in the building and the insulation appears to be old and insufficient. This measure looks at adding insulation on the attic

|                              |                 |                                 |             |                           |                  |
|------------------------------|-----------------|---------------------------------|-------------|---------------------------|------------------|
| Area of Attic                | 10,000 SF       | Cooling System Efficiency       | 1.2 kW/ton  | Heating System Efficiency | 75%              |
| Existing Infiltration Factor | 0.23 cfm/SF     | Ex Occupied Cing Temp.          | 72 °F       | Heating On Point          | 55 °F            |
| Proposed Infiltration Factor | 0.23 cfm/SF     | Ex Unoccupied Cing Temp.        | 72 °F       | Ex Occupied Htg Temp.     | 70 °F            |
| Existing U Value             | 0.100 Btuh/SF°F | Cooling Occ Enthalpy Setpoint   | 27.5 Btu/lb | Ex Unoccupied Htg Temp.   | 70 °F            |
| Proposed U Value             | 0.026 Btuh/SF°F | Cooling Unocc Enthalpy Setpoint | 27.5 Btu/lb | Electricity               | \$ 0.189 \$/kWh  |
| Air Conditioned Area %       | 100%            |                                 |             | Natural Gas               | \$ 1.04 \$/Therm |

|                               |                          |                              |                              |                                | 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 | Wall Infiltration & Heat Load BTUH | Wall Infiltration & Heat Load BTUH | Wall Infiltration & Heat Load BTUH | Wall Infiltration & Heat 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                              |
| 97.5                          | 35.4                     | 6                            | 2                            | 4                              | -107,340                           | -107,340                           | -88,550                            | -88,550                            | 64                          | 53                          | 0                              | 0                              |
| 92.5                          | 37.4                     | 31                           | 11                           | 20                             | -122,985                           | -122,985                           | -107,880                           | -107,880                           | 381                         | 334                         | 0                              | 0                              |
| 87.5                          | 35.0                     | 131                          | 47                           | 84                             | -92,967                            | -92,967                            | -81,546                            | -81,546                            | 1,218                       | 1,068                       | 0                              | 0                              |
| 82.5                          | 33.0                     | 500                          | 179                          | 321                            | -67,912                            | -67,912                            | -60,175                            | -60,175                            | 3,396                       | 3,009                       | 0                              | 0                              |
| 77.5                          | 31.5                     | 620                          | 221                          | 399                            | -47,395                            | -47,395                            | -43,342                            | -43,342                            | 2,938                       | 2,687                       | 0                              | 0                              |
| 72.5                          | 29.9                     | 664                          | 237                          | 427                            | -25,402                            | -25,402                            | -25,033                            | -25,033                            | 1687                        | 1662                        | 0                              | 0                              |
| 67.5                          | 27.2                     | 854                          | 305                          | 549                            | 0                                  | 0                                  | 0                                  | 0                                  | 0                           | 0                           | 0                              | 0                              |
| 62.5                          | 24.0                     | 927                          | 331                          | 596                            | 0                                  | 0                                  | 0                                  | 0                                  | 0                           | 0                           | 0                              | 0                              |
| 57.5                          | 20.3                     | 600                          | 214                          | 386                            | 0                                  | 0                                  | 0                                  | 0                                  | 0                           | 0                           | 0                              | 0                              |
| 52.5                          | 18.2                     | 730                          | 261                          | 469                            | 60,970                             | 60,970                             | 48,075                             | 48,075                             | 0                           | 0                           | 593                            | 468                            |
| 47.5                          | 16.0                     | 491                          | 175                          | 316                            | 78,390                             | 78,390                             | 61,811                             | 61,811                             | 0                           | 0                           | 513                            | 405                            |
| 42.5                          | 14.5                     | 656                          | 234                          | 422                            | 95,810                             | 95,810                             | 75,547                             | 75,547                             | 0                           | 0                           | 838                            | 661                            |
| 37.5                          | 12.5                     | 1,023                        | 365                          | 658                            | 113,230                            | 113,230                            | 89,283                             | 89,283                             | 0                           | 0                           | 1,544                          | 1,218                          |
| 32.5                          | 10.5                     | 734                          | 262                          | 472                            | 130,650                            | 130,650                            | 103,018                            | 103,018                            | 0                           | 0                           | 1,279                          | 1,008                          |
| 27.5                          | 8.7                      | 334                          | 119                          | 215                            | 148,070                            | 148,070                            | 116,754                            | 116,754                            | 0                           | 0                           | 659                            | 520                            |
| 22.5                          | 7.0                      | 252                          | 90                           | 162                            | 165,490                            | 165,490                            | 130,490                            | 130,490                            | 0                           | 0                           | 556                            | 438                            |
| 17.5                          | 5.4                      | 125                          | 45                           | 80                             | 182,910                            | 182,910                            | 144,226                            | 144,226                            | 0                           | 0                           | 305                            | 240                            |
| 12.5                          | 3.7                      | 47                           | 17                           | 30                             | 200,330                            | 200,330                            | 157,962                            | 157,962                            | 0                           | 0                           | 126                            | 99                             |
| 7.5                           | 2.1                      | 34                           | 12                           | 22                             | 217,750                            | 217,750                            | 171,697                            | 171,697                            | 0                           | 0                           | 99                             | 78                             |
| 2.5                           | 1.3                      | 1                            | 0                            | 1                              | 235,170                            | 235,170                            | 185,433                            | 185,433                            | 0                           | 0                           | 3                              | 2                              |
| -2.5                          | 0.0                      | 0                            | 0                            | 0                              | 252,590                            | 252,590                            | 199,169                            | 199,169                            | 0                           | 0                           | 0                              | 0                              |
| TOTALS                        |                          | 8,760                        | 3,129                        | 5,631                          |                                    |                                    |                                    |                                    | 9,684                       | 8,814                       | 6,515                          | 5,137                          |

|                                |               |         |              |          |
|--------------------------------|---------------|---------|--------------|----------|
| Existing Ceiling Infiltration  | 2,300 cfm     | Savings | 1,378 Therms | \$ 1,433 |
| Existing Ceiling Heat Transfer | 1,000 Btuh/°F |         | 870 kWh      | \$ 164   |
| Proposed Ceiling Infiltration  | 2,300 cfm     |         |              | \$ 1,598 |
| Proposed Ceiling Heat Transfer | 263 Btuh/°F   |         |              |          |

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ECM-2 Add Attic Insulation

|             |      |
|-------------|------|
| 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. |            |           |
| Attic Insulation | 10,000 | SF   | \$ 0.73    | \$ 0.50 |        | \$ 7,497       | \$ 6,230 | \$ -   | \$ 13,727  | Estimated |
|                  |        |      |            |         |        |                |          |        |            |           |
|                  |        |      |            |         |        |                |          |        |            |           |

Note: Cost estimates are used for energy savings only. Do not use for procurement

|           |                    |
|-----------|--------------------|
| \$ 13,727 | Subtotal           |
| \$ 4,804  | 35% Contingency    |
| \$ 4,633  | 25% Contractor O&P |
| \$ -      | 0% Engineering     |
| \$ 23,200 | Total              |

**Bloomfield School District**  
**CHA Project Number: 30040**  
**Fair View Elementary School**

**ECM-3 Boiler Replacement**

Description: This ECM evaluates replacing the nearly 90 year old Kewanee boiler with a new steam boiler. The York Shipley boiler installed in 2010 will stay and run as a back up to the new boiler.

| <u>Item</u>                   | <u>Value</u> | <u>Units</u> | <u>Formula/Comments</u>                         |
|-------------------------------|--------------|--------------|-------------------------------------------------|
| Baseline Fuel Cost            | \$ 1.04      | / Therm      | Natural Gas                                     |
| 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                      | 5,600,000    | btu/hr       |                                                 |
| Heating Combustion Efficiency | 75%          |              | Estimated averaged Efficiency without HHW Reset |
| Heating Degree-Day            | 2,783        | Degree-day   |                                                 |
| Design Temperature Difference | 57           | F            |                                                 |
| Fuel Conversion               | 100,000      | btu/therm    |                                                 |
| PROPOSED                      |              |              |                                                 |
| Capacity                      | 5,600,000    | btu/hr       |                                                 |
| Efficiency                    | 80%          |              | Estimated Efficiency after the HHW Reset        |
| SAVINGS                       |              |              |                                                 |
| Fuel Savings                  | 4,375        | therms       | NJ Protocols Calculation                        |
| Fuel Cost Savings             | \$ 4,550     |              |                                                 |

Savings calculation formulas are taken from NJ Protocols document for Occupancy Controlled Thermostats  
 \*50% loaded (two boilers running alternatively)

## Algorithms

### *Gas Savings (Therms)*

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

### Definition of Variables

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

CAPY<sub>Bi</sub> = Total input capacity of the baseline furnace, boiler or heater in Btu/hour

CAPY<sub>Qi</sub> = Total input capacity of the qualifying furnace, boiler or heater in Btu/hour

HDD<sub>mod</sub> = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

HC<sub>fuel</sub> = 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<sub>Q</sub> = Efficiency of qualifying heater(s) (AFUE %)

EFF<sub>B</sub> = Efficiency of baseline heaters (AFUE %)

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

### Furnaces and Boilers

| Component   | Type     | Value                                          | Source                                        |
|-------------|----------|------------------------------------------------|-----------------------------------------------|
| $AFUE_q$    | Variable |                                                | Application                                   |
| $AFUE_b$    | Fixed    | Furnaces: 78%<br>Boilers: 80%<br>Infrared: 78% | EPACT Standard<br>for furnaces and<br>boilers |
| $CAPY_{in}$ | Variable |                                                | Application                                   |
| $\Delta T$  | 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](http://www.spaceray.com/1_space-ray_faqs.php)

### Adjusted Heating Degree Days by Building Type

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

### Heating Degree Days and Outdoor Design Temperature by Zone

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

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**ECM-3 Boiler Replacement - 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. |            |           |
| Demolition               | 1   | EA   |            | \$ 5,000  | \$ 500 | \$ -           | \$ 6,230  | \$ 562 | \$ 6,792   | RS Means  |
| 5600 MBH NG Steam Boiler | 1   | EA   | \$ 105,000 | \$ 9,000  |        | \$ 107,835     | \$ 11,214 | \$ -   | \$ 119,049 | RS Means  |
| Flue Installation        | 1   | LS   | \$ 2,500   | \$ 2,500  |        | \$ 2,568       | \$ 3,115  | \$ -   | \$ 5,683   | Estimated |
| Miscellaneous Electrical | 1   | LS   | \$ 3,000   | \$ 3,000  |        | \$ 3,081       | \$ 3,738  | \$ -   | \$ 6,819   | Estimated |
| Miscellaneous Piping     | 1   | LS   | \$ 25,000  | \$ 15,000 |        | \$ 25,675      | \$ 18,690 | \$ -   | \$ 44,365  | Estimated |
| General Construction     | 1   | LS   | \$ 2,500   | \$ 2,500  |        | \$ 2,568       | \$ 3,115  | \$ -   | \$ 5,683   |           |
|                          |     |      |            |           |        | \$ -           | \$ -      | \$ -   | \$ -       |           |
|                          |     |      |            |           |        | \$ -           | \$ -      | \$ -   | \$ -       |           |
|                          |     |      |            |           |        | \$ -           | \$ -      | \$ -   | \$ -       |           |
|                          |     |      |            |           |        | \$ -           | \$ -      | \$ -   | \$ -       |           |

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

|                   |                 |
|-------------------|-----------------|
| \$ 181,598        | Subtotal        |
| \$ 63,559         | 35% Contingency |
| <b>\$ 245,157</b> | <b>Total</b>    |

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| EQUIPMENT       | AREA/EQUIPMENT SERVED  | COOLING CAPACITY (btu/h) |
|-----------------|------------------------|--------------------------|
| Window AC Units | Classrooms and Offices | 50,000                   |
|                 |                        |                          |
|                 |                        |                          |
|                 |                        |                          |

5

Total btu/h of all window A/C Units: 50,000 btu/h

**ECM-4 Install Window AC Controller**

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

| ASSUMPTIONS                            |                 | Comments                                             |
|----------------------------------------|-----------------|------------------------------------------------------|
| Electric Cost                          | \$0.189 / kWh   |                                                      |
| Average run hours per Week             | 60 Hours        |                                                      |
| Space Balance Point                    | 55 F            |                                                      |
| Space Temperature Setpoint             | 72 deg F        | Setpoint.                                            |
| BTU/Hr Rating of existing DX equipment | 50,000 Btu / Hr | Total BTU/hr of DX cooling equipment to be replaced. |
| Average EER                            | 10.0            |                                                      |
| Existing Annual Electric Usage         | 3,486 kWh       |                                                      |

| Item                           | Value | Units | Comments                                                                |
|--------------------------------|-------|-------|-------------------------------------------------------------------------|
| Proposed Annual Electric Usage | 1,891 | kWh   | Unit will cycle on w/ temp of room. Possible operating time shown below |

| ANNUAL SAVINGS                  |           |
|---------------------------------|-----------|
| Annual Electrical Usage Savings | 1,595 kWh |
| Annual Cost Savings             | \$301     |
| Total Project Cost              | \$1,040   |
| Simple Payback                  | 3 years   |

| OAT - DB Bin Temp F | Annual Hours | Existing Hours of Operation | Proposed % of time of operation | Proposed hrs of Operation |
|---------------------|--------------|-----------------------------|---------------------------------|---------------------------|
| 102.5               | 0            | 0                           | 100%                            | 0                         |
| 97.5                | 6            | 2                           | 100%                            | 2                         |
| 92.5                | 31           | 11                          | 88%                             | 10                        |
| 87.5                | 131          | 47                          | 76%                             | 36                        |
| 82.5                | 500          | 179                         | 65%                             | 116                       |
| 77.5                | 620          | 221                         | 53%                             | 117                       |
| 72.5                | 664          | 237                         | 41%                             | 98                        |
| 67.5                | 854          | 0                           | 0%                              | 0                         |
| 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                         |
| <b>Total</b>        | 8,760        | 697                         | 54%                             | 378                       |

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|             |      |
|-------------|------|
| Multipliers |      |
| Material:   | 1.03 |
| Labor:      | 1.25 |
| Equipment:  | 1.12 |

ECM-4 Install Window AC Controller - Cost

| Description          | QTY | UNIT | UNIT COSTS |       |        | SUBTOTAL COSTS |       |        | TOTAL COST | REMARKS   |
|----------------------|-----|------|------------|-------|--------|----------------|-------|--------|------------|-----------|
|                      |     |      | MAT.       | LABOR | EQUIP. | MAT.           | LABOR | EQUIP. |            |           |
|                      |     |      |            |       |        | 0              | \$ -  | \$ -   | \$ -       |           |
| Window AC Controller | 5   | EA   | \$ 150     | \$ -  | \$ -   | 770.25         | \$ -  | \$ -   | \$ 770     | Estimated |
|                      |     |      |            |       |        | \$ -           | \$ -  | \$ -   | \$ -       |           |

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

|          |                 |
|----------|-----------------|
| \$ 770   | Subtotal        |
| \$ 270   | 35% Contingency |
| \$ 1,040 | Total           |

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**New Jersey Pay For Performance Incentive Program**

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

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

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

|                                      |        |
|--------------------------------------|--------|
| Total Building Area (Square Feet)    | 57,950 |
| Is this audit funded by NJ BPU (Y/N) | Yes    |

Board of Public Utilities (BPU)

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

|                               | Annual Utilities |          |
|-------------------------------|------------------|----------|
|                               | kWh              | Therms   |
| Existing Cost (from utility)  | \$37,314         | \$33,969 |
| Existing Usage (from utility) | 197,542          | 32,659   |
| Proposed Savings              | 19,546           | 1,378    |
| Existing Total MMBtus         | 3,940            |          |
| Proposed Savings MMBtus       | 205              |          |
| % Energy Reduction            | 5.2%             |          |
| Proposed Annual Savings       | \$5,021          |          |

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

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

|                    |          |
|--------------------|----------|
| Total Project Cost | \$50,155 |
|--------------------|----------|

|                                   | Allowable Incentive |     |
|-----------------------------------|---------------------|-----|
| % Incentives #1 of Utility Cost*  | 0.0%                | \$0 |
| % Incentives #2 of Project Cost** | 0.0%                | \$0 |
| % Incentives #3 of Project Cost** | 0.0%                | \$0 |
| Total Eligible Incentives***      | \$0                 |     |
| Project Cost w/ Incentives        | \$50,155            |     |

| Project Payback (years) |               |
|-------------------------|---------------|
| w/o Incentives          | w/ Incentives |
| 10.0                    | 10.0          |

\* 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

Cost of Electricity:

|         |        |
|---------|--------|
| \$0.152 | \$/kWh |
| \$7.08  | \$/kW  |

| EXISTING CONDITIONS |                                                                                                              |                                                    |                                        |                                                |                                                      |                                                                    |                                       |                                           |                                                            |                                           |                         | Retrofit Control |
|---------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------|------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------|-------------------------------------------|------------------------------------------------------------|-------------------------------------------|-------------------------|------------------|
| Field Code          | Area Description<br>Unique description of the location - Room number/Room name: Floor number (if applicable) | Usage<br>Describe Usage Type using Operating Hours | No. of Fixtures<br>before the retrofit | Standard Fixture Code<br>Lighting Fixture Code | Fixture Code<br>Code from Table of Standard Wattages | Watts per Fixture<br>Value from Table of Standard Fixture Wattages | kW/Space<br>(Watts/Fixt) * (Fixt No.) | Exist Control<br>Pre-inst. control device | Annual Hours<br>Estimated annual hours for the usage group | Annual kWh<br>(kW/Space) * (Annual Hours) | Retrofit control device | Notes            |
| 179                 | Closet Basement                                                                                              | Storage Areas                                      | 1                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.06                                  | SW                                        | 1456                                                       | 87                                        | OCC                     |                  |
| 6LED                | Closet                                                                                                       | Storage Areas                                      | 2                                      | T 34 R F 4 (MAG)                               | F44EE                                                | 144                                                                | 0.29                                  | SW                                        | 1456                                                       | 419                                       | OCC                     |                  |
| 179                 | Machine Room                                                                                                 | Storage Areas                                      | 1                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.06                                  | SW                                        | 1456                                                       | 87                                        | OCC                     |                  |
| 16                  | Classroom G1                                                                                                 | Classrooms                                         | 18                                     | T 34 R F 2 (MAG)                               | F42EE                                                | 72                                                                 | 1.30                                  | SW                                        | 1600                                                       | 2,074                                     | OCC                     |                  |
| 179                 | Classroom G3                                                                                                 | Classrooms                                         | 18                                     | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 1.08                                  | SW                                        | 1600                                                       | 1,728                                     | OCC                     |                  |
| 179                 | Classroom G4                                                                                                 | Classrooms                                         | 19                                     | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 1.14                                  | SW                                        | 1600                                                       | 1,824                                     | OCC                     |                  |
| 179                 | Stair                                                                                                        | Stairway                                           | 2                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.12                                  | SW                                        | 3200                                                       | 384                                       | NONE                    |                  |
| 188                 | Restroom                                                                                                     | Restroom                                           | 3                                      | W 34 C F 2                                     | F42EE                                                | 72                                                                 | 0.22                                  | SW                                        | 2080                                                       | 449                                       | OCC                     |                  |
| 261LED              | Boiler Room                                                                                                  | Boiler Room                                        | 3                                      | PAR 38 SP                                      | H100/1                                               | 100                                                                | 0.30                                  | SW                                        | 3750                                                       | 1,125                                     | OCC                     |                  |
| 65                  | Boiler Room                                                                                                  | Boiler Room                                        | 3                                      | I 100                                          | I100/1                                               | 100                                                                | 0.30                                  | SW                                        | 3750                                                       | 1,125                                     | OCC                     |                  |
| 179                 | Boiler Room                                                                                                  | Boiler Room                                        | 1                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.06                                  | SW                                        | 3750                                                       | 225                                       | OCC                     |                  |
| 188                 | Classroom                                                                                                    | Classrooms                                         | 2                                      | W 34 C F 2                                     | F42EE                                                | 72                                                                 | 0.14                                  | SW                                        | 1600                                                       | 230                                       | OCC                     |                  |
| 4LED                | Classroom                                                                                                    | Classrooms                                         | 1                                      | 2B 34 R F 2 (u) (MAG)                          | FU2EE                                                | 72                                                                 | 0.07                                  | SW                                        | 1600                                                       | 115                                       | OCC                     |                  |
| 61LED               | Classroom                                                                                                    | Classrooms                                         | 3                                      | T 34 R F 3 (MAG)                               | F43EE                                                | 115                                                                | 0.35                                  | SW                                        | 1600                                                       | 552                                       | OCC                     |                  |
| 77                  | Storage                                                                                                      | Storage Areas                                      | 1                                      | I 150                                          | I150/1                                               | 150                                                                | 0.15                                  | SW                                        | 1456                                                       | 218                                       | OCC                     |                  |
| 77                  | Storage                                                                                                      | Storage Areas                                      | 2                                      | I 150                                          | I150/1                                               | 150                                                                | 0.30                                  | SW                                        | 1456                                                       | 437                                       | OCC                     |                  |
| 72                  | Storage                                                                                                      | Storage Areas                                      | 2                                      | I 34                                           | I34/1                                                | 34                                                                 | 0.07                                  | SW                                        | 1456                                                       | 99                                        | OCC                     |                  |
| 80                  | Storage                                                                                                      | Storage Areas                                      | 1                                      | SP 36 R CF 1                                   | CFT36/1                                              | 51                                                                 | 0.05                                  | SW                                        | 1456                                                       | 74                                        | OCC                     |                  |
| 261LED              | Storage                                                                                                      | Storage Areas                                      | 1                                      | PAR 38 SP                                      | H100/1                                               | 100                                                                | 0.10                                  | SW                                        | 1456                                                       | 146                                       | OCC                     |                  |
| 77                  | Storage                                                                                                      | Storage Areas                                      | 1                                      | I 150                                          | I150/1                                               | 150                                                                | 0.15                                  | SW                                        | 1456                                                       | 218                                       | OCC                     |                  |
| 179                 | Restroom                                                                                                     | Restroom                                           | 2                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.12                                  | SW                                        | 2080                                                       | 250                                       | OCC                     |                  |
| 188                 | Custodian                                                                                                    | Offices                                            | 4                                      | W 34 C F 2                                     | F42EE                                                | 72                                                                 | 0.29                                  | SW                                        | 2600                                                       | 749                                       | OCC                     |                  |
| 179                 | Stair                                                                                                        | Stairway                                           | 2                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.12                                  | SW                                        | 3200                                                       | 384                                       | NONE                    |                  |
| 179                 | Classroom G7                                                                                                 | Classrooms                                         | 21                                     | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 1.26                                  | SW                                        | 1600                                                       | 2,016                                     | OCC                     |                  |
| 179                 | Classroom G8                                                                                                 | Classrooms                                         | 20                                     | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 1.20                                  | SW                                        | 1600                                                       | 1,920                                     | OCC                     |                  |
| 77                  | Restroom                                                                                                     | Restroom                                           | 1                                      | I 150                                          | I150/1                                               | 150                                                                | 0.15                                  | SW                                        | 2080                                                       | 312                                       | OCC                     |                  |
| 72                  | Closet                                                                                                       | Storage Areas                                      | 2                                      | I 34                                           | I34/1                                                | 34                                                                 | 0.07                                  | SW                                        | 1456                                                       | 99                                        | OCC                     |                  |
| 105LED              | Restroom                                                                                                     | Restroom                                           | 1                                      | W 32 W F 1                                     | F41LL                                                | 32                                                                 | 0.03                                  | SW                                        | 2080                                                       | 67                                        | OCC                     |                  |
| 105LED              | Hallway                                                                                                      | Hallways                                           | 29                                     | W 32 W F 1                                     | F41LL                                                | 32                                                                 | 0.93                                  | SW                                        | 3000                                                       | 2,784                                     | NONE                    |                  |
| 4LED                | Lobby                                                                                                        | Hallways                                           | 4                                      | 2B 34 R F 2 (u) (MAG)                          | FU2EE                                                | 72                                                                 | 0.29                                  | SW                                        | 3000                                                       | 864                                       | NONE                    |                  |
| 77                  | Garage                                                                                                       | Storage Areas                                      | 1                                      | I 150                                          | I150/1                                               | 150                                                                | 0.15                                  | SW                                        | 1456                                                       | 218                                       | OCC                     |                  |
| 111                 | Restroom                                                                                                     | Restroom                                           | 2                                      | W 34 C F 1 (MAG)                               | F41EE                                                | 43                                                                 | 0.09                                  | SW                                        | 2080                                                       | 179                                       | OCC                     |                  |
| 199                 | Kitchen                                                                                                      | Kitchen                                            | 8                                      | W 32 C F 1 (ELE)                               | F41LL                                                | 32                                                                 | 0.26                                  | SW                                        | 1600                                                       | 410                                       | OCC                     |                  |
| 111                 | Storage                                                                                                      | Storage Areas                                      | 3                                      | W 34 C F 1 (MAG)                               | F41EE                                                | 43                                                                 | 0.13                                  | SW                                        | 1456                                                       | 188                                       | OCC                     |                  |
| 77                  | Storage                                                                                                      | Storage Areas                                      | 1                                      | I 150                                          | I150/1                                               | 150                                                                | 0.15                                  | SW                                        | 1456                                                       | 218                                       | OCC                     |                  |
| 72                  | Storage                                                                                                      | Storage Areas                                      | 2                                      | I 34                                           | I34/1                                                | 34                                                                 | 0.07                                  | SW                                        | 1456                                                       | 99                                        | OCC                     |                  |
| 188                 | Multipurpose Room                                                                                            | Gymnasium                                          | 60                                     | W 34 C F 2                                     | F42EE                                                | 72                                                                 | 4.32                                  | SW                                        | 3000                                                       | 12,960                                    | OCC                     |                  |
| 77                  | Stage                                                                                                        | Gymnasium                                          | 8                                      | I 150                                          | I150/1                                               | 150                                                                | 1.20                                  | SW                                        | 3000                                                       | 3,600                                     | OCC                     |                  |
| 188                 | Closet                                                                                                       | Storage Areas                                      | 3                                      | W 34 C F 2                                     | F42EE                                                | 72                                                                 | 0.22                                  | SW                                        | 1456                                                       | 314                                       | OCC                     |                  |
| 6LED                | Classroom 101 First Floor                                                                                    | Classrooms                                         | 8                                      | T 34 R F 4 (MAG)                               | F44EE                                                | 144                                                                | 1.15                                  | SW                                        | 1600                                                       | 1,843                                     | OCC                     |                  |
| 46LED               | Classroom 102                                                                                                | Classrooms                                         | 21                                     | W 32 P F 2 (ELE)                               | F42ILL                                               | 59                                                                 | 1.24                                  | SW                                        | 1600                                                       | 1,982                                     | OCC                     |                  |
| 179                 | Stair                                                                                                        | Stairway                                           | 2                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.12                                  | SW                                        | 3200                                                       | 384                                       | NONE                    |                  |
| 77                  | Restroom                                                                                                     | Restroom                                           | 1                                      | I 150                                          | I150/1                                               | 150                                                                | 0.15                                  | SW                                        | 2080                                                       | 312                                       | OCC                     |                  |
| 46LED               | Classroom 103                                                                                                | Classrooms                                         | 21                                     | W 32 P F 2 (ELE)                               | F42ILL                                               | 59                                                                 | 1.24                                  | SW                                        | 1600                                                       | 1,982                                     | OCC                     |                  |
| 179                 | Closet                                                                                                       | Classrooms                                         | 1                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.06                                  | SW                                        | 1600                                                       | 96                                        | OCC                     |                  |
| 46LED               | Classroom 104                                                                                                | Classrooms                                         | 21                                     | W 32 P F 2 (ELE)                               | F42ILL                                               | 59                                                                 | 1.24                                  | SW                                        | 1600                                                       | 1,982                                     | OCC                     |                  |
| 188                 | Closet                                                                                                       | Classrooms                                         | 1                                      | W 34 C F 2                                     | F42EE                                                | 72                                                                 | 0.07                                  | SW                                        | 1600                                                       | 115                                       | OCC                     |                  |
| 179                 | Classroom 104A                                                                                               | Classrooms                                         | 2                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.12                                  | SW                                        | 1600                                                       | 192                                       | OCC                     |                  |
| 111                 | Lobby                                                                                                        | Hallways                                           | 4                                      | W 34 C F 1 (MAG)                               | F41EE                                                | 43                                                                 | 0.17                                  | SW                                        | 3000                                                       | 516                                       | NONE                    |                  |
| 46LED               | Classroom 106                                                                                                | Classrooms                                         | 21                                     | W 32 P F 2 (ELE)                               | F42ILL                                               | 59                                                                 | 1.24                                  | SW                                        | 1600                                                       | 1,982                                     | OCC                     |                  |
| 188                 | Closet                                                                                                       | Classrooms                                         | 1                                      | W 34 C F 2                                     | F42EE                                                | 72                                                                 | 0.07                                  | SW                                        | 1600                                                       | 115                                       | OCC                     |                  |
| 77                  | Restroom                                                                                                     | Restroom                                           | 1                                      | I 150                                          | I150/1                                               | 150                                                                | 0.15                                  | SW                                        | 2080                                                       | 312                                       | OCC                     |                  |
| 111                 | Hallway                                                                                                      | Hallways                                           | 29                                     | W 34 C F 1 (MAG)                               | F41EE                                                | 43                                                                 | 1.25                                  | SW                                        | 3000                                                       | 3,741                                     | NONE                    |                  |
| 6LED                | Classroom 107                                                                                                | Classrooms                                         | 8                                      | T 34 R F 4 (MAG)                               | F44EE                                                | 144                                                                | 1.15                                  | SW                                        | 1600                                                       | 1,843                                     | OCC                     |                  |
| 188                 | Closet                                                                                                       | Classrooms                                         | 1                                      | W 34 C F 2                                     | F42EE                                                | 72                                                                 | 0.07                                  | SW                                        | 1600                                                       | 115                                       | OCC                     |                  |
| 46LED               | Classroom 105                                                                                                | Classrooms                                         | 21                                     | W 32 P F 2 (ELE)                               | F42ILL                                               | 59                                                                 | 1.24                                  | SW                                        | 1600                                                       | 1,982                                     | OCC                     |                  |
| 179                 | Closet                                                                                                       | Classrooms                                         | 2                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.12                                  | SW                                        | 1600                                                       | 192                                       | OCC                     |                  |
| 179                 | Stair                                                                                                        | Stairway                                           | 2                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.12                                  | SW                                        | 3200                                                       | 384                                       | NONE                    |                  |
| 46LED               | Staff Room                                                                                                   | Classrooms                                         | 21                                     | W 32 P F 2 (ELE)                               | F42ILL                                               | 59                                                                 | 1.24                                  | SW                                        | 1600                                                       | 1,982                                     | OCC                     |                  |
| 18LED               | Closet                                                                                                       | Classrooms                                         | 1                                      | T 32 R F 4 (ELE)                               | F44ILL                                               | 112                                                                | 0.11                                  | SW                                        | 1600                                                       | 179                                       | OCC                     |                  |
| 77                  | Restroom                                                                                                     | Restroom                                           | 1                                      | I 150                                          | I150/1                                               | 150                                                                | 0.15                                  | SW                                        | 2080                                                       | 312                                       | OCC                     |                  |
| 6LED                | Secretary                                                                                                    | Offices                                            | 6                                      | T 34 R F 4 (MAG)                               | F44EE                                                | 144                                                                | 0.86                                  | SW                                        | 2600                                                       | 2,246                                     | OCC                     |                  |
| 93                  | Nurse                                                                                                        | Offices                                            | 2                                      | I 75                                           | I75/1                                                | 75                                                                 | 0.15                                  | SW                                        | 2600                                                       | 390                                       | OCC                     |                  |
| 179                 | Nurse                                                                                                        | Offices                                            | 4                                      | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.24                                  | SW                                        | 2600                                                       | 624                                       | OCC                     |                  |
| 111                 | Restroom                                                                                                     | Restroom                                           | 1                                      | W 34 C F 1 (MAG)                               | F41EE                                                | 43                                                                 | 0.04                                  | SW                                        | 2080                                                       | 89                                        | OCC                     |                  |
| 93                  | Machine Room                                                                                                 | Storage Areas                                      | 2                                      | I 75                                           | I75/1                                                | 75                                                                 | 0.15                                  | SW                                        | 1456                                                       | 218                                       | OCC                     |                  |
| 6LED                | Principal                                                                                                    | Offices                                            | 4                                      | T 34 R F 4 (MAG)                               | F44EE                                                | 144                                                                | 0.58                                  | SW                                        | 2600                                                       | 1,498                                     | OCC                     |                  |
| 179                 | Classroom 210 Second Floor                                                                                   | Classrooms                                         | 16                                     | W 32 C F 2 (ELE)                               | F42LL                                                | 60                                                                 | 0.96                                  | SW                                        | 1600                                                       | 1,536                                     | OCC                     |                  |

Cost of Electricity:

|         |        |
|---------|--------|
| \$0.152 | \$/kWh |
| \$7.08  | \$/kW  |

| EXISTING CONDITIONS |                                                                                          |                                           |                                     |                       |                                      |                                               |                           |                          |                                            |                             |                         | Retrofit Control |
|---------------------|------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------|-----------------------|--------------------------------------|-----------------------------------------------|---------------------------|--------------------------|--------------------------------------------|-----------------------------|-------------------------|------------------|
| Field Code          | Area Description                                                                         | Usage                                     | No. of Fixtures                     | Standard Fixture Code | Fixture Code                         | Watts per Fixture                             | kW/Space                  | Exist Control            | Annual Hours                               | Annual kWh                  |                         |                  |
|                     | 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 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            |
| 179                 | Classroom 202                                                                            | Classrooms                                | 16                                  | W 32 C F 2 (ELE)      | F42LL                                | 60                                            | 0.96                      | SW                       | 1600                                       | 1,536                       | OCC                     |                  |
| 188                 | Closet                                                                                   | Classrooms                                | 2                                   | W 34 C F 2            | F42EE                                | 72                                            | 0.14                      | SW                       | 1600                                       | 230                         | OCC                     |                  |
| 46LED               | Classroom 204                                                                            | Classrooms                                | 21                                  | W 32 P F 2 (ELE)      | F42ILL                               | 59                                            | 1.24                      | SW                       | 1600                                       | 1,982                       | OCC                     |                  |
| 46LED               | Classroom 203                                                                            | Classrooms                                | 21                                  | W 32 P F 2 (ELE)      | F42ILL                               | 59                                            | 1.24                      | SW                       | 1600                                       | 1,982                       | OCC                     |                  |
| 188                 | Closet                                                                                   | Classrooms                                | 4                                   | W 34 C F 2            | F42EE                                | 72                                            | 0.29                      | SW                       | 1600                                       | 461                         | OCC                     |                  |
| 46LED               | Classroom 205                                                                            | Classrooms                                | 21                                  | W 32 P F 2 (ELE)      | F42ILL                               | 59                                            | 1.24                      | SW                       | 1600                                       | 1,982                       | OCC                     |                  |
| 46LED               | Classroom 206                                                                            | Stairway                                  | 21                                  | W 32 P F 2 (ELE)      | F42ILL                               | 59                                            | 1.24                      | SW                       | 3200                                       | 3,965                       | OCC                     |                  |
| 179                 | Resource Room 204A                                                                       | Classrooms                                | 4                                   | W 32 C F 2 (ELE)      | F42LL                                | 60                                            | 0.24                      | SW                       | 1600                                       | 384                         | OCC                     |                  |
| 179                 | Stair                                                                                    | Stairway                                  | 2                                   | W 32 C F 2 (ELE)      | F42LL                                | 60                                            | 0.12                      | SW                       | 3200                                       | 384                         | NONE                    |                  |
| 71                  | Restroom                                                                                 | Restroom                                  | 1                                   | I 60                  | I60/1                                | 60                                            | 0.06                      | SW                       | 2080                                       | 125                         | OCC                     |                  |
| 18LED               | Classroom 208                                                                            | Classrooms                                | 8                                   | T 32 R F 4 (ELE)      | F44ILL                               | 112                                           | 0.90                      | SW                       | 1600                                       | 1,434                       | OCC                     |                  |
| 18LED               | Classroom 207                                                                            | Classrooms                                | 8                                   | T 32 R F 4 (ELE)      | F44ILL                               | 112                                           | 0.90                      | SW                       | 1600                                       | 1,434                       | OCC                     |                  |
| 179                 | Closet                                                                                   | Classrooms                                | 2                                   | W 32 C F 2 (ELE)      | F42LL                                | 60                                            | 0.12                      | SW                       | 1600                                       | 192                         | OCC                     |                  |
| 18LED               | Hallway                                                                                  | Hallways                                  | 13                                  | T 32 R F 4 (ELE)      | F44ILL                               | 112                                           | 1.46                      | SW                       | 3000                                       | 4,368                       | NONE                    |                  |
| 6LED                | Office                                                                                   | Offices                                   | 2                                   | T 34 R F 4 (MAG)      | F44EE                                | 144                                           | 0.29                      | SW                       | 2600                                       | 749                         | OCC                     |                  |
| 46LED               | Classroom 301 Third Floor                                                                | Classrooms                                | 21                                  | W 32 P F 2 (ELE)      | F42ILL                               | 59                                            | 1.24                      | SW                       | 1600                                       | 1,982                       | OCC                     |                  |
| 179                 | Storage                                                                                  | Storage Areas                             | 1                                   | W 32 C F 2 (ELE)      | F42LL                                | 60                                            | 0.06                      | SW                       | 1456                                       | 87                          | OCC                     |                  |
| 53                  | Classroom 300                                                                            | Classrooms                                | 5                                   | T 32 R F 2 (ELE)      | F42LL                                | 60                                            | 0.30                      | SW                       | 1600                                       | 480                         | OCC                     |                  |
| 228                 | Classroom 300                                                                            | Classrooms                                | 2                                   | W60CF1                | F81EL                                | 60                                            | 0.12                      | SW                       | 1600                                       | 192                         | OCC                     |                  |
| 53                  | Restroom                                                                                 | Restroom                                  | 3                                   | T 32 R F 2 (ELE)      | F42LL                                | 60                                            | 0.18                      | SW                       | 2080                                       | 374                         | OCC                     |                  |
| 53                  | Restroom                                                                                 | Restroom                                  | 4                                   | T 32 R F 2 (ELE)      | F42LL                                | 60                                            | 0.24                      | SW                       | 2080                                       | 499                         | OCC                     |                  |
| 228                 | Janitor Closet                                                                           | Janitor's Closet                          | 1                                   | W60CF1                | F81EL                                | 60                                            | 0.06                      | SW                       | 800                                        | 48                          | OCC                     |                  |
| 53                  | Hallway                                                                                  | Hallways                                  | 12                                  | T 32 R F 2 (ELE)      | F42LL                                | 60                                            | 0.72                      | SW                       | 3000                                       | 2,160                       | NONE                    |                  |
| 105LED              | Hallway                                                                                  | Hallways                                  | 16                                  | W 32 W F 1            | F41LL                                | 32                                            | 0.51                      | SW                       | 3000                                       | 1,536                       | NONE                    |                  |
| 179                 | Stair                                                                                    | Stairway                                  | 1                                   | W 32 C F 2 (ELE)      | F42LL                                | 60                                            | 0.06                      | SW                       | 3200                                       | 192                         | NONE                    |                  |
| 35LED               | Classroom 302                                                                            | Classrooms                                | 12                                  | T 32 R F 3 (ELE)      | F43ILL/2                             | 90                                            | 1.08                      | SW                       | 1600                                       | 1,728                       | OCC                     |                  |
| 35LED               | Classroom 303                                                                            | Classrooms                                | 12                                  | T 32 R F 3 (ELE)      | F43ILL/2                             | 90                                            | 1.08                      | SW                       | 1600                                       | 1,728                       | OCC                     |                  |
| 46LED               | Media Center                                                                             | Media Center                              | 34                                  | W 32 P F 2 (ELE)      | F42ILL                               | 59                                            | 2.01                      | SW                       | 1600                                       | 3,210                       | OCC                     |                  |
| 228                 | Media Center                                                                             | Media Center                              | 7                                   | W60CF1                | F81EL                                | 60                                            | 0.42                      | SW                       | 1600                                       | 672                         | OCC                     |                  |
| 35LED               | Classroom 304                                                                            | Classrooms                                | 15                                  | T 32 R F 3 (ELE)      | F43ILL/2                             | 90                                            | 1.35                      | SW                       | 1600                                       | 2,160                       | OCC                     |                  |
| 35LED               | Classroom 305                                                                            | Classrooms                                | 9                                   | T 32 R F 3 (ELE)      | F43ILL/2                             | 90                                            | 0.81                      | SW                       | 1600                                       | 1,296                       | OCC                     |                  |
| 228                 | Classroom 305                                                                            | Classrooms                                | 2                                   | W60CF1                | F81EL                                | 60                                            | 0.12                      | SW                       | 1600                                       | 192                         | OCC                     |                  |
| 53                  | Classroom 306                                                                            | Classrooms                                | 4                                   | T 32 R F 2 (ELE)      | F42LL                                | 60                                            | 0.24                      | SW                       | 1600                                       | 384                         | OCC                     |                  |
| 35LED               | Classroom 307                                                                            | Classrooms                                | 9                                   | T 32 R F 3 (ELE)      | F43ILL/2                             | 90                                            | 0.81                      | SW                       | 1600                                       | 1,296                       | OCC                     |                  |
| 228                 | Classroom 307                                                                            | Classrooms                                | 9                                   | W60CF1                | F81EL                                | 60                                            | 0.54                      | SW                       | 1600                                       | 864                         | OCC                     |                  |
| 261LED              | Exterior                                                                                 | Outdoor Lighting                          | 11                                  | PAR 38 SP             | H100/1                               | 100                                           | 1.10                      | SW                       | 4368                                       | 4,805                       | OCC                     |                  |
| 77                  | Exterior                                                                                 | Outdoor Lighting                          | 3                                   | I 150                 | I150/1                               | 150                                           | 0.45                      | SW                       | 4368                                       | 1,966                       | OCC                     |                  |
| 46LED               | Portacabin Classroom                                                                     | Classrooms                                | 16                                  | W 32 P F 2 (ELE)      | F42ILL                               | 59                                            | 0.94                      | SW                       | 1600                                       | 1,510                       | OCC                     |                  |
| 65                  | Closet in Portacabin                                                                     | Classrooms                                | 1                                   | I 100                 | I100/1                               | 100                                           | 0.10                      | SW                       | 1600                                       | 160                         | OCC                     |                  |
| 65                  | Restroom in Portacabin                                                                   | Restroom                                  | 1                                   | I 100                 | I100/1                               | 100                                           | 0.10                      | SW                       | 2080                                       | 208                         | OCC                     |                  |
|                     |                                                                                          |                                           |                                     |                       |                                      |                                               |                           |                          |                                            |                             |                         |                  |
|                     | Total                                                                                    |                                           | 842                                 |                       |                                      |                                               | 57.85                     |                          |                                            | 119,335                     |                         |                  |

|                  |                                                                                          | 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                  | No. of fixtures                    | Standard Fixture Code                                                                         | Fixture Code                                 | Watts per Fixture                             | kW/Space                            | Retrofit Control        | Annual Hours                               | Annual kWh                  | Annual kWh Saved                              | Annual \$ Saved                               | Retrofit Cost          | NJ Smart Start Lighting Incentive       | Simple Payback                 | Simple Payback                                      |                                                     |
| Field Code       | Unique description of the location - Room number/Room name: Floor number (if applicable) | No. of fixtures before the retrofit | "Lighting Fixture Code" Example R F(U) = 2'x2' Troff 40 w Recess. Floor 2 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 kWh) - (Retrofit Annual kWh) | (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 |
| 179              | Closet Basement                                                                          | 1                                   | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 0.1                       | SW                       | 1456                                      | 87                          | 1                                  | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 0.1                                 | SW                      | 1,456                                      | 87                          | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 6LED             | Closet                                                                                   | 2                                   | T 34 R F 4 (MAG)                                                                        | F44EE                                        | 144                                           | 0.3                       | SW                       | 1456                                      | 419                         | 2                                  | T 74 R LED                                                                                    | RTLED50                                      | 50                                            | 0.1                                 | SW                      | 1,456                                      | 146                         | 274                                           | 0.2                                           | \$ 57.58               | \$ 472.50                               | \$0                            | 8.2                                                 | 8.2                                                 |
| 179              | Machine Room                                                                             | 1                                   | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 0.1                       | SW                       | 1456                                      | 87                          | 1                                  | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 0.1                                 | SW                      | 1,456                                      | 87                          | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 16               | Classroom G1                                                                             | 18                                  | T 34 R F 2 (MAG)                                                                        | F42EE                                        | 72                                            | 1.3                       | SW                       | 1600                                      | 2,074                       | 18                                 | T 28 R F 2                                                                                    | F42SSILL                                     | 48                                            | 0.9                                 | SW                      | 1,600                                      | 1,382                       | 691                                           | 0.4                                           | \$ 141.77              | \$ 2,065.50                             | \$0                            | 14.6                                                | 14.6                                                |
| 179              | Classroom G3                                                                             | 18                                  | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 1.1                       | SW                       | 1600                                      | 1,728                       | 18                                 | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 1.1                                 | SW                      | 1,600                                      | 1,728                       | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 179              | Classroom G4                                                                             | 19                                  | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 1.1                       | SW                       | 1600                                      | 1,824                       | 19                                 | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 1.1                                 | SW                      | 1,600                                      | 1,824                       | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 179              | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 0.1                       | SW                       | 3200                                      | 384                         | 2                                  | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 0.1                                 | SW                      | 3,200                                      | 384                         | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 188              | Restroom                                                                                 | 3                                   | W 34 C F 2                                                                              | F42EE                                        | 72                                            | 0.2                       | SW                       | 2080                                      | 449                         | 3                                  | W 28 R F 2                                                                                    | F42SSILL                                     | 48                                            | 0.1                                 | SW                      | 2,080                                      | 300                         | 150                                           | 0.1                                           | \$ 28.88               | \$ 344.25                               | \$0                            | 11.9                                                | 11.9                                                |
| 26LED            | Boiler Room                                                                              | 3                                   | PAR 38 SP                                                                               | H100/1                                       | 100                                           | 0.3                       | SW                       | 3750                                      | 1,125                       | 3                                  | EVO35/10                                                                                      | EVO35/10                                     | 39                                            | 0.1                                 | SW                      | 3,750                                      | 439                         | 686                                           | 0.2                                           | \$ 119.86              | \$ 1,316.25                             | \$150                          | 11.0                                                | 9.7                                                 |
| 65               | Boiler Room                                                                              | 3                                   | I 100                                                                                   | I100/1                                       | 100                                           | 0.3                       | SW                       | 3750                                      | 1,125                       | 3                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.1                                 | SW                      | 3,750                                      | 304                         | 821                                           | 0.2                                           | \$ 143.44              | \$ 121.50                               | \$0                            | 0.8                                                 | 0.8                                                 |
| 179              | Boiler Room                                                                              | 1                                   | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 0.1                       | SW                       | 3750                                      | 225                         | 1                                  | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 0.1                                 | SW                      | 3,750                                      | 225                         | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 188              | Classroom                                                                                | 2                                   | W 34 C F 2                                                                              | F42EE                                        | 72                                            | 0.1                       | SW                       | 1600                                      | 230                         | 2                                  | W 28 R F 2                                                                                    | F42SSILL                                     | 48                                            | 0.1                                 | SW                      | 1,600                                      | 154                         | 77                                            | 0.0                                           | \$ 15.75               | \$ 229.50                               | \$0                            | 14.6                                                | 14.6                                                |
| 4LED             | Classroom                                                                                | 1                                   | 2B 34 R F 2 (u) (MAG)                                                                   | FU2EE                                        | 72                                            | 0.1                       | SW                       | 1600                                      | 115                         | 1                                  | 2T XX R LED                                                                                   | 2RTLED                                       | 25                                            | 0.0                                 | SW                      | 1,600                                      | 40                          | 75                                            | 0.0                                           | \$ 15.42               | \$ 202.50                               | \$0                            | 13.1                                                | 13.1                                                |
| 61LED            | Classroom                                                                                | 3                                   | T 34 R F 3 (MAG)                                                                        | F43EE                                        | 115                                           | 0.3                       | SW                       | 1600                                      | 552                         | 3                                  | T 59 R LED                                                                                    | RTLED38                                      | 38                                            | 0.1                                 | SW                      | 1,600                                      | 182                         | 370                                           | 0.2                                           | \$ 75.80               | \$ 708.75                               | \$150                          | 9.3                                                 | 7.4                                                 |
| 77               | Storage                                                                                  | 1                                   | I 150                                                                                   | I150/1                                       | 150                                           | 0.2                       | SW                       | 1456                                      | 218                         | 1                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.0                                 | SW                      | 1,456                                      | 39                          | 179                                           | 0.1                                           | \$ 37.67               | \$ 6.75                                 | \$0                            | 0.2                                                 | 0.2                                                 |
| 77               | Storage                                                                                  | 2                                   | I 150                                                                                   | I150/1                                       | 150                                           | 0.3                       | SW                       | 1456                                      | 437                         | 2                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.1                                 | SW                      | 1,456                                      | 79                          | 358                                           | 0.2                                           | \$ 75.34               | \$ 13.50                                | \$0                            | 0.2                                                 | 0.2                                                 |
| 72               | Storage                                                                                  | 2                                   | I 34                                                                                    | I34/1                                        | 34                                            | 0.1                       | SW                       | 1456                                      | 99                          | 2                                  | CF 13                                                                                         | CFQ13/1-L                                    | 15                                            | 0.0                                 | SW                      | 1,456                                      | 44                          | 55                                            | 0.0                                           | \$ 11.64               | \$ 40.50                                | \$0                            | 3.5                                                 | 3.5                                                 |
| 80               | Storage                                                                                  | 1                                   | SP 36 R CF 1                                                                            | CFT36/1                                      | 51                                            | 0.1                       | SW                       | 1456                                      | 74                          | 1                                  | SP 36 R CF 1                                                                                  | CFT36/1                                      | 51                                            | 0.1                                 | SW                      | 1,456                                      | 74                          | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 26LED            | Storage                                                                                  | 1                                   | PAR 38 SP                                                                               | H100/1                                       | 100                                           | 0.1                       | SW                       | 1456                                      | 146                         | 1                                  | EVO35/10                                                                                      | EVO35/10                                     | 39                                            | 0.0                                 | SW                      | 1,456                                      | 57                          | 89                                            | 0.1                                           | \$ 18.68               | \$ 438.75                               | \$50                           | 23.5                                                | 20.8                                                |
| 77               | Storage                                                                                  | 1                                   | I 150                                                                                   | I150/1                                       | 150                                           | 0.2                       | SW                       | 1456                                      | 218                         | 1                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.0                                 | SW                      | 1,456                                      | 39                          | 179                                           | 0.1                                           | \$ 37.67               | \$ 6.75                                 | \$0                            | 0.2                                                 | 0.2                                                 |
| 179              | Restroom                                                                                 | 2                                   | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 0.1                       | SW                       | 2080                                      | 250                         | 2                                  | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 0.1                                 | SW                      | 2,080                                      | 250                         | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 188              | Custodian                                                                                | 4                                   | W 34 C F 2                                                                              | F42EE                                        | 72                                            | 0.3                       | SW                       | 2600                                      | 749                         | 4                                  | W 28 R F 2                                                                                    | F42SSILL                                     | 48                                            | 0.2                                 | SW                      | 2,600                                      | 499                         | 250                                           | 0.1                                           | \$ 46.10               | \$ 459.00                               | \$0                            | 10.0                                                | 10.0                                                |
| 179              | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 0.1                       | SW                       | 3200                                      | 384                         | 2                                  | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 0.1                                 | SW                      | 3,200                                      | 384                         | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 179              | Classroom G7                                                                             | 21                                  | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 1.3                       | SW                       | 1600                                      | 2,016                       | 21                                 | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 1.3                                 | SW                      | 1,600                                      | 2,016                       | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 179              | Classroom G8                                                                             | 20                                  | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 1.2                       | SW                       | 1600                                      | 1,920                       | 20                                 | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 1.2                                 | SW                      | 1,600                                      | 1,920                       | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 77               | Restroom                                                                                 | 1                                   | I 150                                                                                   | I150/1                                       | 150                                           | 0.2                       | SW                       | 2080                                      | 312                         | 1                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.0                                 | SW                      | 2,080                                      | 56                          | 256                                           | 0.1                                           | \$ 49.34               | \$ 6.75                                 | \$0                            | 0.1                                                 | 0.1                                                 |
| 72               | Closet                                                                                   | 2                                   | I 34                                                                                    | I34/1                                        | 34                                            | 0.1                       | SW                       | 1456                                      | 99                          | 2                                  | CF 13                                                                                         | CFQ13/1-L                                    | 15                                            | 0.0                                 | SW                      | 1,456                                      | 44                          | 55                                            | 0.0                                           | \$ 11.64               | \$ 40.50                                | \$0                            | 3.5                                                 | 3.5                                                 |
| 105LED           | Restroom                                                                                 | 1                                   | W 32 W F 1                                                                              | F41LL                                        | 32                                            | 0.0                       | SW                       | 2080                                      | 67                          | 1                                  | 4 ft LED Tube                                                                                 | 200732x1                                     | 15                                            | 0.0                                 | SW                      | 2,080                                      | 31                          | 35                                            | 0.0                                           | \$ 6.82                | \$ 81.68                                | \$50                           | 12.0                                                | 4.6                                                 |
| 106LED           | Hallway                                                                                  | 29                                  | W 32 W F 1                                                                              | F41LL                                        | 32                                            | 0.9                       | SW                       | 3000                                      | 2,784                       | 29                                 | 4 ft LED Tube                                                                                 | 200732x1                                     | 15                                            | 0.4                                 | SW                      | 3,000                                      | 1,305                       | 1,479                                         | 0.5                                           | \$ 266.69              | \$ 2,368.58                             | \$1,450                        | 8.9                                                 | 3.4                                                 |
| 4LED             | Lobby                                                                                    | 4                                   | 2B 34 R F 2 (u) (MAG)                                                                   | FU2EE                                        | 72                                            | 0.3                       | SW                       | 3000                                      | 864                         | 4                                  | 2T XX R LED                                                                                   | 2RTLED                                       | 25                                            | 0.1                                 | SW                      | 3,000                                      | 300                         | 564                                           | 0.2                                           | \$ 101.70              | \$ 810.00                               | \$0                            | 8.0                                                 | 8.0                                                 |
| 77               | Garage                                                                                   | 1                                   | I 150                                                                                   | I150/1                                       | 150                                           | 0.2                       | SW                       | 1456                                      | 218                         | 1                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.0                                 | SW                      | 1,456                                      | 39                          | 179                                           | 0.1                                           | \$ 37.67               | \$ 6.75                                 | \$0                            | 0.2                                                 | 0.2                                                 |
| 111              | Restroom                                                                                 | 2                                   | W 34 C F 1 (MAG)                                                                        | F41EE                                        | 43                                            | 0.1                       | SW                       | 2080                                      | 179                         | 2                                  | W 28 C F 1                                                                                    | F41SSILL                                     | 26                                            | 0.1                                 | SW                      | 2,080                                      | 108                         | 71                                            | 0.0                                           | \$ 13.64               | \$ 202.50                               | \$0                            | 14.8                                                | 14.8                                                |
| 199              | Kitchen                                                                                  | 8                                   | W 32 C F 1 (ELE)                                                                        | F41LL                                        | 32                                            | 0.3                       | SW                       | 1600                                      | 410                         | 8                                  | W 28 C F 1                                                                                    | F41SSILL                                     | 26                                            | 0.2                                 | SW                      | 1,600                                      | 333                         | 77                                            | 0.0                                           | \$ 15.75               | \$ 918.00                               | \$0                            | 58.3                                                | 58.3                                                |
| 111              | Storage                                                                                  | 3                                   | W 34 C F 1 (MAG)                                                                        | F41EE                                        | 43                                            | 0.1                       | SW                       | 1456                                      | 188                         | 3                                  | W 28 C F 1                                                                                    | F41SSILL                                     | 26                                            | 0.1                                 | SW                      | 1,456                                      | 114                         | 74                                            | 0.1                                           | \$ 15.62               | \$ 303.75                               | \$0                            | 19.4                                                | 19.4                                                |
| 77               | Storage                                                                                  | 1                                   | I 150                                                                                   | I150/1                                       | 150                                           | 0.2                       | SW                       | 1456                                      | 218                         | 1                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.0                                 | SW                      | 1,456                                      | 39                          | 179                                           | 0.1                                           | \$ 37.67               | \$ 6.75                                 | \$0                            | 0.2                                                 | 0.2                                                 |
| 72               | Storage                                                                                  | 2                                   | I 34                                                                                    | I34/1                                        | 34                                            | 0.1                       | SW                       | 1456                                      | 99                          | 2                                  | CF 13                                                                                         | CFQ13/1-L                                    | 15                                            | 0.0                                 | SW                      | 1,456                                      | 44                          | 55                                            | 0.0                                           | \$ 11.64               | \$ 40.50                                | \$0                            | 3.5                                                 | 3.5                                                 |
| 179              | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 0.1                       | SW                       | 3200                                      | 384                         | 2                                  | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 0.1                                 | SW                      | 3,200                                      | 384                         | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 71               | Restroom                                                                                 | 1                                   | I 60                                                                                    | I60/1                                        | 60                                            | 0.1                       | SW                       | 2080                                      | 125                         | 1                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.0                                 | SW                      | 2,080                                      | 56                          | 69                                            | 0.0                                           | \$ 13.24               | \$ 6.75                                 | \$0                            | 0.5                                                 | 0.5                                                 |
| 18LED            | Classroom 208                                                                            | 8                                   | T 32 R F 4 (ELE)                                                                        | F44LL                                        | 112                                           | 0.9                       | SW                       | 1600                                      | 1,434                       | 8                                  | T 74 R LED                                                                                    | RTLED50                                      | 50                                            | 0.4                                 | SW                      | 1,600                                      | 640                         | 794                                           | 0.5                                           | \$ 162.77              | \$ 1,890.00                             | \$0                            | 11.6                                                | 11.6                                                |
| 18LED            | Classroom 207                                                                            | 8                                   | T 32 R F 4 (ELE)                                                                        | F44LL                                        | 112                                           | 0.9                       | SW                       | 1600                                      | 1,434                       | 8                                  | T 74 R LED                                                                                    | RTLED50                                      | 50                                            | 0.4                                 | SW                      | 1,600                                      | 640                         | 794                                           | 0.5                                           | \$ 162.77              | \$ 1,890.00                             | \$0                            | 11.6                                                | 11.6                                                |
| 179              | Closet                                                                                   | 2                                   | W 32 C F 2 (ELE)                                                                        | F42LL                                        | 60                                            | 0.1                       | SW                       | 1600                                      | 192                         | 2                                  | W 32 C F 2 (ELE)                                                                              | F42LL                                        | 60                                            | 0.1                                 | SW                      | 1,600                                      | 192                         | -                                             | 0.0                                           | \$ -                   | \$ -                                    | \$0                            |                                                     | #DIV/0!                                             |
| 18LED            | Hallway                                                                                  | 13                                  | T 32 R F 4 (ELE)                                                                        | F44LL                                        | 112                                           | 1.5                       | SW                       | 3000                                      | 4,368                       | 13                                 | T 74 R LED                                                                                    | RTLED50                                      | 50                                            | 0.7                                 | SW                      | 3,000                                      | 1,950                       | 2,418                                         | 0.8                                           | \$ 436.01              | \$ 3,071.25                             | \$0                            | 7.0                                                 | 7.0                                                 |
| 77               | Exterior                                                                                 | 3                                   | I 150                                                                                   | I150/1                                       | 150                                           | 0.5                       | SW                       | 4368                                      | 1,965                       | 3                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.1                                 | SW                      | 4,368                                      | 354                         | 1,612                                         | 0.4                                           | \$ 276.34              | \$ 20.25                                | \$0                            | 0.1                                                 | 0.1                                                 |
| 46LED            | Portacabin Classroom                                                                     | 16                                  | W 32 P F 2 (ELE)                                                                        | F42ILL                                       | 59                                            | 0.9                       | SW                       | 1600                                      | 1,510                       | 16                                 | 4 ft LED Tube                                                                                 | 200732x2                                     | 30                                            | 0.5                                 | SW                      | 1,600                                      | 768                         | 742                                           | 0.5                                           | \$ 152.27              | \$ 2,613.60                             | \$800                          | 17.2                                                | 11.9                                                |
| 65               | Closet in Portacabin                                                                     | 1                                   | I 100                                                                                   | I100/1                                       | 100                                           | 0.1                       | SW                       | 1600                                      | 160                         | 1                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.0                                 | SW                      | 1,600                                      | 43                          | 117                                           | 0.1                                           | \$ 23.96               | \$ 40.50                                | \$0                            | 1.7                                                 | 1.7                                                 |
| 65               | Restroom in Portacabin                                                                   | 1                                   | I 100                                                                                   | I100/1                                       | 100                                           | 0.1                       | SW                       | 2080                                      | 208                         | 1                                  | CF 26                                                                                         | CFQ26/1-L                                    | 27                                            | 0.0                                 | SW                      | 2,080                                      | 56                          | 152                                           | 0.1                                           | \$ 29.28               | \$ 40.50                                | \$0                            | 1.4                                                 | 1.4                                                 |
| Total            |                                                                                          | 243                                 |                                                                                         |                                              |                                               | 16.7                      |                          |                                           | 34,154                      | 243                                |                                                                                               |                                              | 1,809                                         | 10.5                                |                         |                                            | 20,179                      | 13,975                                        | 6.2                                           | \$2,650                | \$20,785                                | \$2,650                        |                                                     |                                                     |
|                  |                                                                                          |                                     |                                                                                         |                                              |                                               |                           |                          |                                           |                             |                                    |                                                                                               |                                              |                                               |                                     |                         |                                            |                             | Demand Savings                                |                                               | \$526                  |                                         |                                |                                                     |                                                     |

|            |                                                                                          | EXISTING CONDITIONS                 |                       |                                              |                                               |                           |                                     | RETROFIT CONDITIONS     |                                            |                             |                                               | COST & SAVINGS ANALYSIS                     |                       |                                         |                                   |                                                     |                                                     |  |
|------------|------------------------------------------------------------------------------------------|-------------------------------------|-----------------------|----------------------------------------------|-----------------------------------------------|---------------------------|-------------------------------------|-------------------------|--------------------------------------------|-----------------------------|-----------------------------------------------|---------------------------------------------|-----------------------|-----------------------------------------|-----------------------------------|-----------------------------------------------------|-----------------------------------------------------|--|
|            | Area Description                                                                         | No. of Fixtures                     | Standard Fixture Code | Fixture Code                                 | Watts per Fixture                             | kW/Space                  | kW/Space                            | Retrofit Control        | Annual Hours                               | Annual kWh                  | Annual kWh Saved                              | Annual kW Saved                             | Annual \$ Saved       | Retrofit Cost                           | NJ Smart Start Lighting Incentive | Simple Payback With Out Incentive                   | Simple Payback                                      |  |
| Field Code | Unique description of the location - Room number/Room name: Floor number (if applicable) | No. of fixtures before the retrofit | Lighting Fixture Code | Code from Table of Standard Fixture Wattages | Value from Table of Standard Fixture Wattages | (Watts/Fixt) * (Fixt No.) | (Watts/Fixt) * (Number of Fixtures) | Retrofit control device | Estimated annual hours for the usage group | (kW/Space) * (Annual Hours) | (Original Annual kWh) - (Retrofit Annual kWh) | (Original Annual kW) - (Retrofit Annual kW) | (kW Saved) * (\$/kWh) | Cost for renovations to lighting system |                                   | Length of time for renovations cost to be recovered | Length of time for renovations cost to be recovered |  |
| 179        | Closet Basement                                                                          | 1                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | 0.1                                 | OCC                     | 1019.2                                     | 61.2                        | 26.2                                          | 0.0                                         | \$3.98                | \$128.25                                | \$20.00                           | 32.2                                                | 27.2                                                |  |
| 6LED       | Closet                                                                                   | 2                                   | T 34 R F 4 (MAG)      | F44EE                                        | 144                                           | 0.3                       | 0.3                                 | OCC                     | 1019.2                                     | 293.5                       | 125.8                                         | 0.0                                         | \$19.12               | \$128.25                                | \$20.00                           | 6.7                                                 | 5.7                                                 |  |
| 179        | Machine Room                                                                             | 1                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | 0.1                                 | OCC                     | 1019.2                                     | 61.2                        | 26.2                                          | 0.0                                         | \$3.98                | \$128.25                                | \$20.00                           | 32.2                                                | 27.2                                                |  |
| 16         | Classroom G1                                                                             | 18                                  | T 34 R F 2 (MAG)      | F42EE                                        | 72                                            | 1.3                       | 1.3                                 | OCC                     | 1280                                       | 1,658.9                     | 414.7                                         | 0.0                                         | \$63.04               | \$128.25                                | \$20.00                           | 2.0                                                 | 1.7                                                 |  |
| 179        | Classroom G3                                                                             | 18                                  | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 1.1                       | 1.1                                 | OCC                     | 1280                                       | 1,382.4                     | 345.6                                         | 0.0                                         | \$52.53               | \$128.25                                | \$20.00                           | 2.4                                                 | 2.1                                                 |  |
| 179        | Classroom G4                                                                             | 19                                  | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 1.1                       | 1.1                                 | OCC                     | 1280                                       | 1,459.2                     | 364.8                                         | 0.0                                         | \$55.45               | \$128.25                                | \$20.00                           | 2.3                                                 | 2.0                                                 |  |
| 179        | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | 0.1                                 | NONE                    | 3200                                       | 384.0                       | 0.0                                           | 0.0                                         | \$0.00                | \$0.00                                  |                                   | #DIV/0!                                             |                                                     |  |
| 188        | Restroom                                                                                 | 3                                   | W 34 C F 2            | F42EE                                        | 72                                            | 0.2                       | 0.2                                 | OCC                     | 1456                                       | 314.5                       | 134.8                                         | 0.0                                         | \$20.49               | \$128.25                                | \$20.00                           | 6.3                                                 | 5.3                                                 |  |
| 261LED     | Boiler Room                                                                              | 3                                   | PAR 38 SP             | H100/1                                       | 100                                           | 0.3                       | 0.3                                 | OCC                     | 3375                                       | 1,012.5                     | 112.5                                         | 0.0                                         | \$17.10               | \$128.25                                | \$20.00                           | 7.5                                                 | 6.3                                                 |  |
| 65         | Boiler Room                                                                              | 3                                   | I100                  | I100/1                                       | 100                                           | 0.3                       | 0.3                                 | OCC                     | 3375                                       | 1,012.5                     | 112.5                                         | 0.0                                         | \$17.10               | \$128.25                                | \$20.00                           | 7.5                                                 | 6.3                                                 |  |
| 179        | Boiler Room                                                                              | 1                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | 0.1                                 | OCC                     | 3375                                       | 202.5                       | 22.5                                          | 0.0                                         | \$3.42                | \$128.25                                | \$20.00                           | 37.5                                                | 31.7                                                |  |
| 188        | Classroom                                                                                | 2                                   | W 34 C F 2            | F42EE                                        | 72                                            | 0.1                       | 0.1                                 | OCC                     | 1280                                       | 184.3                       | 46.1                                          | 0.0                                         | \$7.00                | \$128.25                                | \$20.00                           | 18.3                                                | 15.5                                                |  |
| 4LED       | Classroom                                                                                | 1                                   | 2B 34 R F 2 (u) (MAG) | FU2EE                                        | 72                                            | 0.1                       | 0.1                                 | OCC                     | 1280                                       | 92.2                        | 23.0                                          | 0.0                                         | \$3.50                | \$128.25                                | \$20.00                           | 36.6                                                | 30.9                                                |  |
| 61LED      | Classroom                                                                                | 3                                   | T 34 R F 3 (MAG)      | F43EE                                        | 115                                           | 0.3                       | 0.3                                 | OCC                     | 1280                                       | 441.6                       | 110.4                                         | 0.0                                         | \$16.78               | \$128.25                                | \$20.00                           | 7.6                                                 | 6.5                                                 |  |
| 77         | Storage                                                                                  | 1                                   | I150                  | I150/1                                       | 150                                           | 0.2                       | 0.2                                 | OCC                     | 1019.2                                     | 152.9                       | 65.5                                          | 0.0                                         | \$9.96                | \$128.25                                | \$20.00                           | 12.9                                                | 10.9                                                |  |
| 77         | Storage                                                                                  | 2                                   | I150                  | I150/1                                       | 150                                           | 0.3                       | 0.3                                 | OCC                     | 1019.2                                     | 305.8                       | 131.0                                         | 0.0                                         | \$19.92               | \$128.25                                | \$20.00                           | 6.4                                                 | 5.4                                                 |  |
| 72         | Storage                                                                                  | 2                                   | I34                   | I34/1                                        | 34                                            | 0.1                       | 0.1                                 | OCC                     | 1019.2                                     | 69.3                        | 29.7                                          | 0.0                                         | \$4.51                | \$128.25                                | \$20.00                           | 28.4                                                | 24.0                                                |  |
| 80         | Storage                                                                                  | 1                                   | SP 36 R CF 1          | CFT36/1                                      | 51                                            | 0.1                       | 0.1                                 | OCC                     | 1019.2                                     | 52.0                        | 22.3                                          | 0.0                                         | \$3.39                | \$128.25                                | \$20.00                           | 37.9                                                | 32.0                                                |  |
| 261LED     | Storage                                                                                  | 1                                   | PAR 38 SP             | H100/1                                       | 100                                           | 0.1                       | 0.1                                 | OCC                     | 1019.2                                     | 101.9                       | 43.7                                          | 0.0                                         | \$6.64                | \$128.25                                | \$20.00                           | 19.3                                                | 16.3                                                |  |
| 77         | Storage                                                                                  | 1                                   | I150                  | I150/1                                       | 150                                           | 0.2                       | 0.2                                 | OCC                     | 1019.2                                     | 152.9                       | 65.5                                          | 0.0                                         | \$9.96                | \$128.25                                | \$20.00                           | 12.9                                                | 10.9                                                |  |
| 179        | Restroom                                                                                 | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | 0.1                                 | OCC                     | 1456                                       | 174.7                       | 74.9                                          | 0.0                                         | \$11.38               | \$128.25                                | \$20.00                           | 11.3                                                | 9.5                                                 |  |
| 188        | Custodian                                                                                | 4                                   | W 34 C F 2            | F42EE                                        | 72                                            | 0.3                       | 0.3                                 | OCC                     | 2080                                       | 599.0                       | 149.8                                         | 0.0                                         | \$22.76               | \$128.25                                | \$20.00                           | 5.6                                                 | 4.8                                                 |  |
| 179        | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | 0.1                                 | NONE                    | 3200                                       | 384.0                       | 0.0                                           | 0.0                                         | \$0.00                | \$0.00                                  |                                   | #DIV/0!                                             |                                                     |  |
| 179        | Classroom G7                                                                             | 21                                  | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 1.3                       | 1.3                                 | OCC                     | 1280                                       | 1,612.8                     | 403.2                                         | 0.0                                         | \$61.29               | \$128.25                                | \$20.00                           | 2.1                                                 | 1.8                                                 |  |
| 179        | Classroom G8                                                                             | 20                                  | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 1.2                       | 1.2                                 | OCC                     | 1280                                       | 1,536.0                     | 384.0                                         | 0.0                                         | \$58.37               | \$128.25                                | \$20.00                           | 2.2                                                 | 1.9                                                 |  |
| 77         | Restroom                                                                                 | 1                                   | I150                  | I150/1                                       | 150                                           | 0.2                       | 0.2                                 | OCC                     | 1456                                       | 218.4                       | 93.6                                          | 0.0                                         | \$14.23               | \$128.25                                | \$20.00                           | 9.0                                                 | 7.6                                                 |  |
| 72         | Closet                                                                                   | 2                                   | I34                   | I34/1                                        | 34                                            | 0.1                       | 0.1                                 | OCC                     | 1019.2                                     | 69.3                        | 29.7                                          | 0.0                                         | \$4.51                | \$128.25                                | \$20.00                           | 28.4                                                | 24.0                                                |  |
| 105LED     | Restroom                                                                                 | 1                                   | W 32 W F 1            | F41LL                                        | 32                                            | 0.0                       | 0.0                                 | OCC                     | 1456                                       | 46.6                        | 20.0                                          | 0.0                                         | \$3.04                | \$128.25                                | \$20.00                           | 42.3                                                | 35.7                                                |  |
| 105LED     | Hallway                                                                                  | 29                                  | W 32 W F 1            | F41LL                                        | 32                                            | 0.9                       | 0.9                                 | NONE                    | 3000                                       | 2,784.0                     | 0.0                                           | 0.0                                         | \$0.00                | \$0.00                                  |                                   | #DIV/0!                                             |                                                     |  |
| 4LED       | Lobby                                                                                    | 4                                   | 2B 34 R F 2 (u) (MAG) | FU2EE                                        | 72                                            | 0.3                       | 0.3                                 | NONE                    | 3000                                       | 864.0                       | 0.0                                           | 0.0                                         | \$0.00                | \$0.00                                  |                                   | #DIV/0!                                             |                                                     |  |
| 77         | Garage                                                                                   | 1                                   | I150                  | I150/1                                       | 150                                           | 0.2                       | 0.2                                 | OCC                     | 1019.2                                     | 152.9                       | 65.5                                          | 0.0                                         | \$9.96                | \$128.25                                | \$20.00                           | 12.9                                                | 10.9                                                |  |
| 111        | Restroom                                                                                 | 2                                   | W 34 C F 1 (MAG)      | F41EE                                        | 43                                            | 0.1                       | 0.1                                 | OCC                     | 1456                                       | 125.2                       | 53.7                                          | 0.0                                         | \$8.16                | \$128.25                                | \$20.00                           | 15.7                                                | 13.3                                                |  |
| 199        | Kitchen                                                                                  | 8                                   | W 32 C F 1 (ELE)      | F41LL                                        | 32                                            | 0.3                       | 0.3                                 | OCC                     | 1280                                       | 327.7                       | 81.9                                          | 0.0                                         | \$12.45               | \$128.25                                | \$20.00                           | 10.3                                                | 8.7                                                 |  |
| 111        | Storage                                                                                  | 3                                   | W 34 C F 1 (MAG)      | F41EE                                        | 43                                            | 0.1                       | 0.1                                 | OCC                     | 1019.2                                     | 131.5                       | 56.3                                          | 0.0                                         | \$8.56                | \$128.25                                | \$20.00                           | 15.0                                                | 12.6                                                |  |
| 77         | Storage                                                                                  | 1                                   | I150                  | I150/1                                       | 150                                           | 0.2                       | 0.2                                 | OCC                     | 1019.2                                     | 152.9                       | 65.5                                          | 0.0                                         | \$9.96                | \$128.25                                | \$20.00                           | 12.9                                                | 10.9                                                |  |
| 72         | Storage                                                                                  | 2                                   | I34                   | I34/1                                        | 34                                            | 0.1                       | 0.1                                 | OCC                     | 1019.2                                     | 69.3                        | 29.7                                          | 0.0                                         | \$4.51                | \$128.25                                | \$20.00                           | 28.4                                                | 24.0                                                |  |
| 179        | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | 0.1                                 | NONE                    | 3200                                       | 384.0                       | 0.0                                           | 0.0                                         | \$0.00                | \$0.00                                  |                                   | #DIV/0!                                             |                                                     |  |
| 71         | Restroom                                                                                 | 1                                   | I60                   | I60/1                                        | 60                                            | 0.1                       | 0.1                                 | OCC                     | 1456                                       | 87.4                        | 37.4                                          | 0.0                                         | \$5.69                | \$128.25                                | \$20.00                           | 22.5                                                | 19.0                                                |  |
| 18LED      | Classroom 208                                                                            | 8                                   | T 32 R F 4 (ELE)      | F44ILL                                       | 112                                           | 0.9                       | 0.9                                 | OCC                     | 1280                                       | 1,146.9                     | 286.7                                         | 0.0                                         | \$43.58               | \$128.25                                | \$20.00                           | 2.9                                                 | 2.5                                                 |  |
| 18LED      | Classroom 207                                                                            | 8                                   | T 32 R F 4 (ELE)      | F44ILL                                       | 112                                           | 0.9                       | 0.9                                 | OCC                     | 1280                                       | 1,146.9                     | 286.7                                         | 0.0                                         | \$43.58               | \$128.25                                | \$20.00                           | 2.9                                                 | 2.5                                                 |  |
| 179        | Closet                                                                                   | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | 0.1                                 | OCC                     | 1280                                       | 153.6                       | 38.4                                          | 0.0                                         | \$5.84                | \$128.25                                | \$20.00                           | 22.0                                                | 18.5                                                |  |
| 18LED      | Hallway                                                                                  | 13                                  | T 32 R F 4 (ELE)      | F44ILL                                       | 112                                           | 1.5                       | 1.5                                 | NONE                    | 3000                                       | 4,368.0                     | 0.0                                           | 0.0                                         | \$0.00                | \$0.00                                  |                                   | #DIV/0!                                             |                                                     |  |
| 77         | Exterior                                                                                 | 3                                   | I150                  | I150/1                                       | 150                                           | 0.5                       | 0.5                                 | OCC                     | 4368                                       | 1,965.6                     | 0.0                                           | 0.0                                         | \$0.00                | \$128.25                                | \$20.00                           |                                                     | #DIV/0!                                             |  |
| 46LED      | Portacabin Classroom                                                                     | 16                                  | W 32 P F 2 (ELE)      | F42ILL                                       | 59                                            | 0.9                       | 0.9                                 | OCC                     | 1280                                       | 1,208.3                     | 302.1                                         | 0.0                                         | \$45.92               | \$128.25                                | \$20.00                           | 2.8                                                 | 2.4                                                 |  |
| 65         | Closet in Portacabin                                                                     | 1                                   | I100                  | I100/1                                       | 100                                           | 0.1                       | 0.1                                 | OCC                     | 1280                                       | 128.0                       | 32.0                                          | 0.0                                         | \$4.86                | \$128.25                                | \$20.00                           | 26.4                                                | 22.3                                                |  |
| 65         | Restroom in Portacabin                                                                   | 1                                   | I100                  | I100/1                                       | 100                                           | 0.1                       | 0.1                                 | OCC                     | 1456                                       | 145.6                       | 62.4                                          | 0.0                                         | \$9.48                | \$128.25                                | \$20.00                           | 13.5                                                | 11.4                                                |  |
| Total      |                                                                                          | 243                                 |                       |                                              |                                               | 16.7                      | 16.7                                |                         |                                            | 29,377.65                   | 4,776.42                                      | 0.0                                         | 726.0                 | 5130.0                                  | 800.0                             |                                                     |                                                     |  |
|            |                                                                                          |                                     |                       |                                              |                                               |                           |                                     |                         |                                            | Demand Savings              |                                               |                                             | 0.0                   | \$0                                     |                                   |                                                     |                                                     |  |

|                  |                                                                                          | EXISTING CONDITIONS                 |                       |                                              |                                               |                           |                          |                                           |                             |                    |                                    | RETROFIT CONDITIONS   |                                              |                                               |                                     |                         |                                            |                               |                                               |                        |                                         | COST & SAVINGS ANALYSIS        |                |                                                     |  |  |  |  |  |
|------------------|------------------------------------------------------------------------------------------|-------------------------------------|-----------------------|----------------------------------------------|-----------------------------------------------|---------------------------|--------------------------|-------------------------------------------|-----------------------------|--------------------|------------------------------------|-----------------------|----------------------------------------------|-----------------------------------------------|-------------------------------------|-------------------------|--------------------------------------------|-------------------------------|-----------------------------------------------|------------------------|-----------------------------------------|--------------------------------|----------------|-----------------------------------------------------|--|--|--|--|--|
| Area Description |                                                                                          | No. of Fixtures                     | Standard Fixture Code | Fixture Code                                 | Watts per Fixture                             | kW/Space                  | Pre-Inst. 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 \$ Saved                               | Retrofit Cost          | NJ Smart Start Incentive                | Simple Payback                 | Simple Payback |                                                     |  |  |  |  |  |
| Field Code       | Unique description of the location - Room number/Room name: Floor number (if applicable) | No. of fixtures before the retrofit | Lighting Fixture Code | Code from Table of Standard Fixture Wattages | Value from Table of Standard Fixture Wattages | (Watts/Fixt) * (Fixt No.) | Pre-inst. control device | Estimated daily hours for the usage group | (kW/Space) * (Annual Hours) |                    | No. of fixtures after the retrofit | Lighting Fixture Code | Code from Table of Standard Fixture Wattages | Value from Table of Standard Fixture Wattages | (Watts/Fixt) * (Number of Fixtures) | Retrofit control device | Estimated annual hours for the usage group | (Annual kWh) * (Annual Hours) | (Original Annual kWh) - (Retrofit Annual kWh) | (kWh Saved) * (\$/kWh) | Cost for renovations to lighting system | Prescriptive Lighting Measures |                | Length of time for renovations cost to be recovered |  |  |  |  |  |
| 179              | Closet Basement                                                                          | 1                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | SW                       | 1456                                      | 87                          | 1                  | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 0.1                                           | OCC                                 | 1,019                   | 61                                         | 26                            | 0.0                                           | \$ 3.98                | \$ 128.25                               | \$ 20                          | 32.2           |                                                     |  |  |  |  |  |
| 6LED             | Closet                                                                                   | 2                                   | T 34 R F 4 (MAG)      | F44EE                                        | 144                                           | 0.3                       | SW                       | 1456                                      | 419                         | 2                  | T 74 R LED                         | RTLED50               | 50                                           | 0.1                                           | OCC                                 | 1,019                   | 102                                        | 317                           | 0.2                                           | \$ 64.22               | \$ 600.75                               | \$ 20                          | 9.4            |                                                     |  |  |  |  |  |
| 179              | Machine Room                                                                             | 1                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | SW                       | 1456                                      | 87                          | 1                  | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 0.1                                           | OCC                                 | 1,019                   | 61                                         | 26                            | 0.0                                           | \$ 3.98                | \$ 128.25                               | \$ 20                          | 32.2           |                                                     |  |  |  |  |  |
| 16               | Classroom G1                                                                             | 18                                  | T 34 R F 2 (MAG)      | F42EE                                        | 72                                            | 1.3                       | SW                       | 1600                                      | 2,074                       | 18                 | T 28 R F 2                         | F42SSILL              | 48                                           | 0.9                                           | OCC                                 | 1,280                   | 1,106                                      | 968                           | 0.4                                           | \$ 183.79              | \$ 2,193.75                             | \$ 20                          | 11.9           |                                                     |  |  |  |  |  |
| 179              | Classroom G3                                                                             | 18                                  | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 1.1                       | SW                       | 1600                                      | 1,728                       | 18                 | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 1.1                                           | OCC                                 | 1,280                   | 1,382                                      | 346                           | 0.0                                           | \$ 52.53               | \$ 128.25                               | \$ 20                          | 2.4            |                                                     |  |  |  |  |  |
| 179              | Classroom G4                                                                             | 19                                  | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 1.1                       | SW                       | 1600                                      | 1,824                       | 19                 | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 1.1                                           | OCC                                 | 1,459                   | 1,459                                      | 365                           | 0.0                                           | \$ 55.45               | \$ 128.25                               | \$ 20                          | 2.3            |                                                     |  |  |  |  |  |
| 179              | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | SW                       | 3200                                      | 384                         | 2                  | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 0.1                                           | NONE                                | 3,200                   | 384                                        | 0                             | 0.0                                           | \$ -                   | \$ -                                    | \$ -                           | -              |                                                     |  |  |  |  |  |
| 188              | Restroom                                                                                 | 3                                   | W 34 C F 2            | F42EE                                        | 72                                            | 0.2                       | SW                       | 2080                                      | 449                         | 3                  | W 28 R F 2                         | F42SSILL              | 48                                           | 0.1                                           | OCC                                 | 1,456                   | 210                                        | 240                           | 0.1                                           | \$ 42.54               | \$ 472.50                               | \$ 20                          | 11.1           |                                                     |  |  |  |  |  |
| 26LED            | Boiler Room                                                                              | 3                                   | PAR 38 SP             | H100/1                                       | 100                                           | 0.3                       | SW                       | 3750                                      | 1,125                       | 3                  | EVO35/10                           | EVO35/10              | 39                                           | 0.1                                           | OCC                                 | 3,375                   | 395                                        | 730                           | 0.2                                           | \$ 126.53              | \$ 1,444.50                             | \$ 170                         | 11.4           |                                                     |  |  |  |  |  |
| 65               | Boiler Room                                                                              | 3                                   | I 100                 | I100/1                                       | 100                                           | 0.3                       | SW                       | 3750                                      | 1,125                       | 3                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.1                                           | OCC                                 | 3,375                   | 273                                        | 852                           | 0.2                                           | \$ 148.05              | \$ 249.75                               | \$ 20                          | 1.7            |                                                     |  |  |  |  |  |
| 179              | Boiler Room                                                                              | 1                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | SW                       | 3750                                      | 225                         | 1                  | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 0.1                                           | OCC                                 | 3,375                   | 203                                        | 23                            | 0.0                                           | \$ 3.42                | \$ 128.25                               | \$ 20                          | 37.5           |                                                     |  |  |  |  |  |
| 188              | Classroom                                                                                | 2                                   | W 34 C F 2            | F42EE                                        | 72                                            | 0.1                       | SW                       | 1600                                      | 230                         | 2                  | W 28 R F 2                         | F42SSILL              | 48                                           | 0.1                                           | OCC                                 | 1,280                   | 123                                        | 108                           | 0.0                                           | \$ 20.42               | \$ 357.75                               | \$ 20                          | 17.5           |                                                     |  |  |  |  |  |
| 4LED             | Classroom                                                                                | 1                                   | 28 34 R F 2 (u) (MAG) | FU2EE                                        | 72                                            | 0.1                       | SW                       | 1600                                      | 115                         | 1                  | 2T XX R LED                        | 2RTLED                | 25                                           | 0.0                                           | OCC                                 | 1,280                   | 32                                         | 83                            | 0.0                                           | \$ 16.64               | \$ 330.75                               | \$ 20                          | 19.9           |                                                     |  |  |  |  |  |
| 61LED            | Classroom                                                                                | 3                                   | T 34 R F 3 (MAG)      | F43EE                                        | 115                                           | 0.3                       | SW                       | 1600                                      | 552                         | 3                  | T 59 R LED                         | RTLED38               | 38                                           | 0.1                                           | OCC                                 | 1,280                   | 146                                        | 406                           | 0.2                                           | \$ 81.35               | \$ 837.00                               | \$ 170                         | 10.3           |                                                     |  |  |  |  |  |
| 77               | Storage                                                                                  | 1                                   | I 150                 | I150/1                                       | 150                                           | 0.2                       | SW                       | 1456                                      | 218                         | 1                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.0                                           | OCC                                 | 1,019                   | 28                                         | 191                           | 0.1                                           | \$ 39.46               | \$ 135.00                               | \$ 20                          | 3.4            |                                                     |  |  |  |  |  |
| 77               | Storage                                                                                  | 2                                   | I 150                 | I150/1                                       | 150                                           | 0.3                       | SW                       | 1456                                      | 437                         | 2                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.1                                           | OCC                                 | 1,019                   | 55                                         | 382                           | 0.2                                           | \$ 78.93               | \$ 141.75                               | \$ 20                          | 1.8            |                                                     |  |  |  |  |  |
| 72               | Storage                                                                                  | 2                                   | I 34                  | I34/1                                        | 34                                            | 0.1                       | SW                       | 1456                                      | 99                          | 2                  | CF 13                              | CFQ13/1-L             | 15                                           | 0.0                                           | OCC                                 | 1,019                   | 31                                         | 68                            | 0.0                                           | \$ 13.63               | \$ 168.75                               | \$ 20                          | 12.4           |                                                     |  |  |  |  |  |
| 80               | Storage                                                                                  | 1                                   | SP 36 R CF 1          | CFT36/1                                      | 51                                            | 0.1                       | SW                       | 1456                                      | 74                          | 1                  | SP 36 R CF 1                       | CFT36/1               | 51                                           | 0.1                                           | OCC                                 | 1,019                   | 52                                         | 22                            | 0.0                                           | \$ 3.39                | \$ 128.25                               | \$ 20                          | 37.9           |                                                     |  |  |  |  |  |
| 26LED            | Storage                                                                                  | 1                                   | PAR 38 SP             | H100/1                                       | 100                                           | 0.1                       | SW                       | 1456                                      | 146                         | 1                  | EVO35/10                           | EVO35/10              | 39                                           | 0.0                                           | OCC                                 | 1,019                   | 40                                         | 106                           | 0.1                                           | \$ 21.27               | \$ 567.00                               | \$ 70                          | 26.7           |                                                     |  |  |  |  |  |
| 77               | Storage                                                                                  | 1                                   | I 150                 | I150/1                                       | 150                                           | 0.2                       | SW                       | 1456                                      | 218                         | 1                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.0                                           | OCC                                 | 1,019                   | 28                                         | 191                           | 0.1                                           | \$ 39.46               | \$ 135.00                               | \$ 20                          | 3.4            |                                                     |  |  |  |  |  |
| 179              | Restroom                                                                                 | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | SW                       | 2080                                      | 250                         | 2                  | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 0.1                                           | OCC                                 | 1,456                   | 175                                        | 75                            | 0.0                                           | \$ 11.38               | \$ 128.25                               | \$ 20                          | 11.3           |                                                     |  |  |  |  |  |
| 188              | Custodian                                                                                | 4                                   | W 34 C F 2            | F42EE                                        | 72                                            | 0.3                       | SW                       | 2600                                      | 749                         | 4                  | W 28 R F 2                         | F42SSILL              | 48                                           | 0.2                                           | OCC                                 | 2,080                   | 399                                        | 349                           | 0.1                                           | \$ 61.27               | \$ 587.25                               | \$ 20                          | 9.6            |                                                     |  |  |  |  |  |
| 179              | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | SW                       | 3200                                      | 384                         | 2                  | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 0.1                                           | NONE                                | 3,200                   | 384                                        | -                             | 0.0                                           | \$ -                   | \$ -                                    | \$ -                           | -              |                                                     |  |  |  |  |  |
| 179              | Classroom G7                                                                             | 21                                  | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 1.3                       | SW                       | 1600                                      | 2,016                       | 21                 | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 1.3                                           | OCC                                 | 1,280                   | 1,613                                      | 403                           | 0.0                                           | \$ 61.29               | \$ 128.25                               | \$ 20                          | 2.1            |                                                     |  |  |  |  |  |
| 179              | Classroom G8                                                                             | 20                                  | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 1.2                       | SW                       | 1600                                      | 1,920                       | 20                 | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 1.2                                           | OCC                                 | 1,280                   | 1,536                                      | 384                           | 0.0                                           | \$ 58.37               | \$ 128.25                               | \$ 20                          | 2.2            |                                                     |  |  |  |  |  |
| 77               | Restroom                                                                                 | 1                                   | I 150                 | I150/1                                       | 150                                           | 0.2                       | SW                       | 2080                                      | 312                         | 1                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.0                                           | OCC                                 | 1,456                   | 39                                         | 273                           | 0.1                                           | \$ 51.90               | \$ 135.00                               | \$ 20                          | 2.6            |                                                     |  |  |  |  |  |
| 72               | Closet                                                                                   | 2                                   | I 34                  | I34/1                                        | 34                                            | 0.1                       | SW                       | 1456                                      | 99                          | 2                  | CF 13                              | CFQ13/1-L             | 15                                           | 0.0                                           | OCC                                 | 1,019                   | 31                                         | 68                            | 0.0                                           | \$ 13.63               | \$ 168.75                               | \$ 20                          | 12.4           |                                                     |  |  |  |  |  |
| 105LED           | Restroom                                                                                 | 1                                   | W 32 W F 1            | F41LL                                        | 32                                            | 0.0                       | SW                       | 2080                                      | 67                          | 1                  | 4 ft LED Tube                      | 200732x4              | 15                                           | 0.0                                           | OCC                                 | 1,456                   | 22                                         | 45                            | 0.0                                           | \$ 8.24                | \$ 209.93                               | \$ 70                          | 25.5           |                                                     |  |  |  |  |  |
| 105LED           | Hallway                                                                                  | 29                                  | W 32 W F 1            | F41LL                                        | 32                                            | 0.9                       | SW                       | 3000                                      | 2,784                       | 29                 | 4 ft LED Tube                      | 200732x4              | 15                                           | 0.4                                           | NONE                                | 3,000                   | 1,305                                      | 1,479                         | 0.5                                           | \$ 266.69              | \$ 2,368.58                             | \$ 1,450                       | 8.9            |                                                     |  |  |  |  |  |
| 4LED             | Lobby                                                                                    | 4                                   | 28 34 R F 2 (u) (MAG) | FU2EE                                        | 72                                            | 0.3                       | SW                       | 3000                                      | 864                         | 4                  | 2T XX R LED                        | 2RTLED                | 25                                           | 0.1                                           | NONE                                | 3,000                   | 300                                        | 564                           | 0.2                                           | \$ 101.70              | \$ 810.00                               | \$ -                           | 8.0            |                                                     |  |  |  |  |  |
| 77               | Garage                                                                                   | 1                                   | I 150                 | I150/1                                       | 150                                           | 0.2                       | SW                       | 1456                                      | 218                         | 1                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.0                                           | OCC                                 | 1,019                   | 28                                         | 191                           | 0.1                                           | \$ 39.46               | \$ 135.00                               | \$ 20                          | 3.4            |                                                     |  |  |  |  |  |
| 111              | Restroom                                                                                 | 2                                   | W 34 C F 1 (MAG)      | F41EE                                        | 43                                            | 0.1                       | SW                       | 2080                                      | 179                         | 2                  | W 28 C F 1                         | F41SSILL              | 26                                           | 0.1                                           | OCC                                 | 1,456                   | 76                                         | 103                           | 0.0                                           | \$ 18.57               | \$ 330.75                               | \$ 20                          | 17.8           |                                                     |  |  |  |  |  |
| 199              | Kitchen                                                                                  | 8                                   | W 32 C F 1 (ELE)      | F41LL                                        | 32                                            | 0.3                       | SW                       | 1600                                      | 410                         | 8                  | W 28 C F 1                         | F41SSILL              | 26                                           | 0.2                                           | OCC                                 | 1,280                   | 266                                        | 143                           | 0.0                                           | \$ 25.87               | \$ 1,046.25                             | \$ 20                          | 40.4           |                                                     |  |  |  |  |  |
| 111              | Storage                                                                                  | 3                                   | W 34 C F 1 (MAG)      | F41EE                                        | 43                                            | 0.1                       | SW                       | 1456                                      | 188                         | 3                  | W 28 C F 1                         | F41SSILL              | 26                                           | 0.1                                           | OCC                                 | 1,019                   | 79                                         | 108                           | 0.1                                           | \$ 20.80               | \$ 432.00                               | \$ 20                          | 20.8           |                                                     |  |  |  |  |  |
| 77               | Storage                                                                                  | 1                                   | I 150                 | I150/1                                       | 150                                           | 0.2                       | SW                       | 1456                                      | 218                         | 1                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.0                                           | OCC                                 | 1,019                   | 28                                         | 191                           | 0.1                                           | \$ 39.46               | \$ 135.00                               | \$ 20                          | 3.4            |                                                     |  |  |  |  |  |
| 72               | Storage                                                                                  | 2                                   | I 34                  | I34/1                                        | 34                                            | 0.1                       | SW                       | 1456                                      | 99                          | 2                  | CF 13                              | CFQ13/1-L             | 15                                           | 0.0                                           | OCC                                 | 1,019                   | 31                                         | 68                            | 0.0                                           | \$ 13.63               | \$ 168.75                               | \$ 20                          | 12.4           |                                                     |  |  |  |  |  |
| 179              | Stair                                                                                    | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | SW                       | 3200                                      | 384                         | 2                  | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 0.1                                           | NONE                                | 3,200                   | 384                                        | 0                             | 0.0                                           | \$ -                   | \$ -                                    | \$ -                           | -              |                                                     |  |  |  |  |  |
| 71               | Restroom                                                                                 | 1                                   | I 60                  | I60/1                                        | 60                                            | 0.1                       | SW                       | 2080                                      | 125                         | 1                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.0                                           | OCC                                 | 1,456                   | 39                                         | 85                            | 0.0                                           | \$ 15.80               | \$ 135.00                               | \$ 20                          | 8.5            |                                                     |  |  |  |  |  |
| 18LED            | Classroom 208                                                                            | 8                                   | T 32 R F 4 (ELE)      | F44ILL                                       | 112                                           | 0.9                       | SW                       | 1600                                      | 1,434                       | 8                  | T 74 R LED                         | RTLED90               | 50                                           | 0.4                                           | OCC                                 | 1,280                   | 512                                        | 922                           | 0.5                                           | \$ 182.22              | \$ 2,018.25                             | \$ 20                          | 11.1           |                                                     |  |  |  |  |  |
| 18LED            | Classroom 207                                                                            | 8                                   | T 32 R F 4 (ELE)      | F44ILL                                       | 112                                           | 0.9                       | SW                       | 1600                                      | 1,434                       | 8                  | T 74 R LED                         | RTLED90               | 50                                           | 0.4                                           | OCC                                 | 1,280                   | 512                                        | 922                           | 0.5                                           | \$ 182.22              | \$ 2,018.25                             | \$ 20                          | 11.1           |                                                     |  |  |  |  |  |
| 179              | Closet                                                                                   | 2                                   | W 32 C F 2 (ELE)      | F42LL                                        | 60                                            | 0.1                       | SW                       | 1600                                      | 192                         | 2                  | W 32 C F 2 (ELE)                   | F42LL                 | 60                                           | 0.1                                           | OCC                                 | 1,280                   | 154                                        | 38                            | 0.0                                           | \$ 5.84                | \$ 128.25                               | \$ 20                          | 22.0           |                                                     |  |  |  |  |  |
| 18LED            | Hallway                                                                                  | 13                                  | T 32 R F 4 (ELE)      | F44ILL                                       | 112                                           | 1.5                       | SW                       | 3000                                      | 4,368                       | 13                 | T 74 R LED                         | RTLED90               | 50                                           | 0.7                                           | NONE                                | 3,000                   | 1,950                                      | 2,418                         | 0.8                                           | \$ 436.01              | \$ 3,071.25                             | \$ -                           | -              |                                                     |  |  |  |  |  |
| 77               | Exterior                                                                                 | 3                                   | I 150                 | I150/1                                       | 150                                           | 0.5                       | SW                       | 4368                                      | 1,966                       | 3                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.1                                           | OCC                                 | 4,368                   | 354                                        | 1,612                         | 0.4                                           | \$ 276.34              | \$ 148.50                               | \$ 20                          | 0.5            |                                                     |  |  |  |  |  |
| 46LED            | Portacabin Classroom                                                                     | 16                                  | W 32 P F 2 (ELE)      | F42LL                                        | 59                                            | 0.9                       | SW                       | 1600                                      | 1,510                       | 16                 | 4 ft LED Tube                      | 200732x2              | 30                                           | 0.5                                           | OCC                                 | 1,280                   | 614                                        | 896                           | 0.5                                           | \$ 175.61              | \$ 2,741.85                             | \$ 820                         | 15.6           |                                                     |  |  |  |  |  |
| 65               | Closet in Portacabin                                                                     | 1                                   | I 100                 | I100/1                                       | 100                                           | 0.1                       | SW                       | 1600                                      | 160                         | 1                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.0                                           | OCC                                 | 1,280                   | 35                                         | 125                           | 0.1                                           | \$ 25.27               | \$ 168.75                               | \$ 20                          | 6.7            |                                                     |  |  |  |  |  |
| 65               | Restroom in Portacabin                                                                   | 1                                   | I 100                 | I100/1                                       | 100                                           | 0.1                       | SW                       | 2080                                      | 208                         | 1                  | CF 26                              | CFQ26/1-L             | 27                                           | 0.0                                           | OCC                                 | 1,456                   | 39                                         | 169                           | 0.1                                           | \$ 31.84               | \$ 168.75                               | \$ 20                          | 5.3            |                                                     |  |  |  |  |  |
| S                | Total                                                                                    | 243                                 |                       |                                              |                                               | 16.7                      |                          |                                           | 34,154                      | 243                |                                    |                       |                                              | 10.5                                          |                                     |                         | 17,073                                     |                               | 6.2                                           | 3,122                  | 25,915                                  | \$3,450                        |                |                                                     |  |  |  |  |  |
| S                |                                                                                          |                                     |                       |                                              |                                               |                           |                          |                                           |                             |                    |                                    |                       |                                              |                                               |                                     |                         |                                            |                               | 6.2                                           | \$526                  |                                         |                                |                |                                                     |  |  |  |  |  |
| S                |                                                                                          |                                     |                       |                                              |                                               |                           |                          |                                           |                             |                    |                                    |                       |                                              |                                               |                                     |                         |                                            |                               | 17,081                                        | \$2,596                |                                         |                                |                |                                                     |  |  |  |  |  |

## **APPENDIX D**

### **New Jersey Board of Public Utilities Incentives**

- i. Smart Start**
  - ii. Direct Install**
  - iii. Pay for Performance (P4P)**
  - iv. Energy Savings Improvement Plan (ESIP)**
-

## I. SMART START



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## NJ SmartStart Buildings

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FOOD SERVICE EQUIPMENT

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COMBINED HEAT & POWER AND  
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LOCAL GOVERNMENT ENERGY  
AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT  
PROGRAM

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OIL, PROPANE & MUNICIPAL  
ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM



#### With New Jersey SmartStart Buildings ...

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

#### Special Notice

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

**Visit the Sandy web page for details and important links.**

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

[Project Categories](#)

[Custom Measures](#)

[Incentives for Qualifying Equipment and Projects](#)

[Program Terms and Conditions](#)

[Find a Trade Ally](#)

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

#### Getting Started

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

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

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

**Support for Custom Energy-Efficiency Measures**

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

**Incentives for Qualifying Equipment and Projects**

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

Find out more about equipment incentives

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

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### COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

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## Equipment Incentives

### Special Notice

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

**Visit the Sandy web page for details and important links.**

### More reasons for a smart start on your next project!

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

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

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

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



#### Electric Chillers

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

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

#### Gas Cooling

Gas absorption chillers (\$185-\$450 per ton)

Gas Engine-Driven Chillers (Calculated through Custom Measure F)

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

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

**Ground Source Heat Pumps**

Closed Loop (\$450-750 per ton)

**Gas Heating**

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

**Variable Frequency Drives**

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

**Natural Gas Water Heating**

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

**Premium Motors**

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

**Refrigerator/Freezer Case Premium Efficiency Motors (ECM)**

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

**Prescriptive Lighting**

New Linear Fluorescent

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

New Induction (\$70 per replaced HID fixture)

New LED

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

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

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

Display case (\$30 per case)

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

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

Parking garage luminaires (\$100 per fixture)

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

Stairwell and Passageway luminaires (\$40 per fixture)

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

Bollard (\$50 per fixture)

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

Fuel pump canopy (\$100 per fixture)

LED retrofit kits (custom measures)

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

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

Induction Retrofit (\$50 per retrofitted HID fixture)

New Construction/Complete Renovation (performance-based)

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

### Lighting Controls

#### Occupancy Sensors

Wall mounted (\$20 per control)

Remote mounted (\$35 per control)

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

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

#### HID or Fluorescent Hi-Bay Controls

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

Daylight dimming (\$45 per fixture controlled)

### Refrigeration

#### Covers and Doors

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

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

#### Controls

Door Heater Control (\$50 per control)

Electric Defrost Control (\$50 per control)

Evaporator Fan Control (\$75 per control)

Novelty Cooler Shutoff (\$50 per control)

## Food Service Equipment

### Cooking

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

### Holding

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

### Cooling

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

### Cleaning

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

## Other Equipment Incentives\*

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

Custom electric and gas equipment incentives (not prescriptive)

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

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## II. DIRECT INSTALL



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ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

NEW JERSEY'S CLEAN ENERGY PROGRAM

### DIRECT Install

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

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

#### ELIGIBILITY



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

#### SYSTEMS & EQUIPMENT ADDRESSED BY THE PROGRAM

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



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

### III. PAY FOR PERFORMANCE (P4P)



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## Pay for Performance - Existing Buildings

Download program applications and incentive forms.

### The Greater the Savings, the Greater Your Incentives

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



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

#### Eligibility

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

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

### ENERGY STAR Portfolio Manager

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



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

#### Incentives

**OIL, PROPANE & MUNICIPAL  
ELECTRIC CUSTOMERS**

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

**EDA PROGRAMS**

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

**SBC CREDIT PROGRAM**

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

**PAST PROGRAMS**

**TOOLS AND RESOURCES**

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

**PROGRAM UPDATES**

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

**CONTACT US**

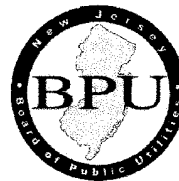


**A detailed Incentive Structure document is available on the applications and form**

### **Steps to Participation**

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

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# PAY FOR PERFORMANCE APPLICATION FORM

July 1, 2014 – June 30, 2015

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

## Instructions

1. Read the program material to determine project qualification.
2. Read the Participation Agreement and sign where indicated.
3. Fill out all applicable spaces on this form.
4. Provide a copy of the customer's company W-9 form.
5. Provide the most recent consecutive 12 month period of utility bills for the project for all accounts, organized in chronological order and separated by account. Utilize Utility Tool for applications with multiple accounts to organize data.

6. Provide brief description of facility, noting any special or unusual circumstances and/or site conditions.
7. Partner must submit the application package via e-mail, mail or fax DIRECTLY to the Market Manager – see back of this form.

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

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

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

## Partner Information

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

## Project Information

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

## Funding

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

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

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

## Additional Project information

Additional Utility Account(s)

|              |                |
|--------------|----------------|
| Account type | Account number |
| Account type | Account number |
| Account type | Account number |
| Account type | Account number |
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## Additional Comments:

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

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

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

**Visit our website: [NJCleanEnergy.com/P4P](http://NJCleanEnergy.com/P4P)**

New Jersey SmartStart Buildings<sup>®</sup> is a registered trademark. Use of the mark without the permission of the New Jersey Board of Public Utilities, Office of Clean Energy is prohibited.

\*Incentives/Requirements subject to change.

001-FY15-07/14

# Pay For Performance-Existing Buildings

## Participation Agreement

### Definitions:

**ADMINISTRATOR** – New Jersey Board of Public Utilities (NJBPU)

**APPLICATION PROCESS** – The Program pays incentives in phases upon satisfactory completion of each of three Program milestones - approval of a complete Energy Reduction Plan, installation of all recommended measures per the Energy Reduction Plan, completion of Post-Construction Benchmarking Report (for incentive amounts, please refer to Incentive Amounts). In order to be eligible for Program Incentives, a Participating Customer or an agent authorized by a Customer, must submit to the Market Manager a properly completed application package – application form, Participating Customer's company W-9, twelve consecutive months of the project's utility bills and executed Participation Agreement. All components of the application package must be filled out completely, truthfully and accurately. This application package must be received on or before June 30, 2015 in order to be eligible for the Fiscal Year 2015 Incentives. The Market Manager will review the application package to determine if the project is eligible for a Program Incentive. When approved, the Participating Customer will receive an approval letter from their Case Manager with the estimated authorized first incentive amount and the date by which the Energy Reduction Plan must be submitted. Upon receipt of the approval letter, the Participating Customer and Partner may proceed with work on the Energy Reduction Plan. The Market Manager or agent thereof reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the Energy Reduction Plan approval letter. Approval of this Application is not an approval of the project's scope of work. Scope of work is only approved upon approval of the Energy Reduction Plan. See application and program guidelines for more information.

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

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

*Equipment procured by participating Customer through another program offered by the New Jersey Utilities, as applicable, is not eligible for incentives through this Program. Customers who, from July 1, 2013 – June 30, 2014, have not contributed to the Societal benefits Change of the applicable New Jersey Utility may not be eligible for incentives offered through this program.*

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

**ENERGY-EFFICIENT MEASURES** – Any device eligible to receive a Program Incentive payment through the New Jersey's Clean Energy Commercial and Industrial Program. The total package of measures as presented in the Energy Reduction Plan must have at least a 10% internal rate of return (IRR).

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

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

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

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

**INCENTIVE CAP** – Program Incentives #2 and #3 will be capped not to exceed 50% of the total actual project cost. Incentive #1 will be capped not to exceed 50% of the project's annual energy cost. The Market Manager reserves the right to limit the amount of the Program Incentives (Incentive #1, #2 and #3) to \$1M per gas and electric account (limited to \$2M per project) in a program year. Campus style facilities, which are master-metered, are subject to the annual incentive cap of \$1 million per gas and electric account. The Participating Customer will also be subject to an annual Entry Cap of \$4M (Definition of an Entry can be found in the Board Order Docket No. EO07030203).

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

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

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

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

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

completely, truthfully and accurately. Upon review of the submittal package (by the Market Manager or agent thereof), the remaining 50% of the total performance-based incentive (Incentives #2 & #3) will be released to the Participating Customer. If the Post-Construction Benchmarking Report indicates that the project did not meet the minimum performance target, the post-installation completion period may be extended to up to twenty-four months subsequent to the Incentive Payment #2 package submission date. Upon approval of the submittal package, the Customer will receive an Incentive #3 Submittal approval letter indicating successful completion of the program.

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

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

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

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

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

**PERFORMANCE TARGET** – A minimum of a 15% annual source energy savings performance target must be achieved in order to participate. The performance target is based on reducing the total energy consumption for the facility. No more than 50% of the total source energy savings may be derived from lighting measures. The total energy savings may not come from a single measure. A 4% performance target may be offered to customers whose annual energy consumption is heavily weighted to manufacturing and process loads. This approach will be reviewed on a case-by-case basis and must be pre-approved by the Market Manager. In order to be considered, the project must involve: A manufacturing facility, including such industries as plastics and packaging, chemicals, petrochemicals, metals, paper and pulp, transportation, biotechnology, pharmaceutical, food and beverage, mining and mineral processing, general manufacturing, equipment manufacturers and data centers; and manufacturing and/or process-related loads, including data center consumption, consume 50% or more of total facility energy consumption. No more than 50% of the total source energy savings may be derived from non-investor owned utilities or fuels.

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

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

**PRE-INSTALLED MEASURES** – An Energy Reduction Plan must be approved by the program and an approval letter sent to the customer in order for incentives to be committed. Upon receipt of an Energy Reduction Plan, all project facilities must be pre-inspected. Measures installed prior to pre-inspection of the facility shall not be included as part of the ERP scope of work and will not be eligible for incentives. Measure installation undertaken prior to ERP approval, but after pre-inspection, is done at the customer's own risk. In the event that an Energy Reduction Plan is rejected by the program, the customer will not receive any incentives.

**PRODUCT INSTALLATION OR EQUIPMENT INSTALLATION** – Installation of the Energy-Efficient Measures.

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

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

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

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

**PROGRAM OFFER** – The Program covers products purchased and/or services rendered on or after July 1, 2014. Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities.

**PROJECT** – A commercial, industrial or multifamily existing building with peak demand in excess of 100 kW in any of the most recent preceding twelve months of electric usage. Multifamily building(s) must be four (4) stories or greater or three (3) stories and under having central heating, cooling, or metering serving more than one building. The 100 kW requirement is waived for the following customer classes: hospitals, non-profits (as defined by section 501(c)(3) of the Internal Revenue Code), public colleges and universities, local government entities, including K-12 schools, and affordable multifamily customers (defined as low income, subsidized, HUD, etc.)

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

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

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

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

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

CUSTOMER'S SIGNATURE

PARTNER SIGNATURE

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

#### IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)



## Your Power to Save

At Home, for Business, and for the Future

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HOME

RESIDENTIAL

COMMERCIAL, INDUSTRIAL  
AND LOCAL GOVERNMENT



### COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

#### PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND  
FUEL CELLS

LOCAL GOVERNMENT ENERGY  
AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT  
PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL  
ELECTRIC CUSTOMERS

EDA PROGRAMS

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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 Chapter 4 of the Laws of 2009 (the law), the "Energy Savings Improvement Program" (ESIP), provides all government agencies in New Jersey with a flexible tool to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements. The ESIP provides all government agencies in New Jersey with a flexible tool to make energy related improvements to their facilities and pay for the costs using the value of energy savings that result from the improvements.

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

Local Government  
School Districts (K-12)

All RFPs must be submitted to the Board for approval at [ESIP@bpu.state.nj.us](mailto:ESIP@bpu.state.nj.us).

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings  
Procedures for Implementation

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

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

### FIRST STEP – ENERGY AUDIT

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

### ENERGY REDUCTION PLANS

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

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

## **ESIP PROGRAM**

Final version 42413

### **BPU RULES**

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

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

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

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

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

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

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

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

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

## **APPENDIX E**

### **Photovoltaic Analysis**

**Photovoltaic (PV) Solar Power Generation - Screening Assessment**

**BLOOMFIELD SCHOOL DISTRICT  
FAIRVIEW ELEMENTARY SCHOOL**

|                     |         |        |
|---------------------|---------|--------|
| Cost of Electricity | \$0.189 | /kWh   |
| Electricity Usage   | 197,542 | kWh/yr |
| System Unit Cost    | \$4,000 | /kW    |

**Photovoltaic (PV) Solar Power Generation - Screening Assessment**

| Budgetary | Annual Utility Savings |        |        |          | Estimated   | Total    | Federal Tax | New Jersey | Payback    | Payback    |
|-----------|------------------------|--------|--------|----------|-------------|----------|-------------|------------|------------|------------|
| Cost      |                        |        |        |          | Maintenance | Savings  | Credit      | Renewable  | (without   | (with      |
|           |                        |        |        |          | Savings     |          |             | ** SREC    | incentive) | incentive) |
| \$        | kW                     | kWh    | therms | \$       | \$          | \$       | \$          | \$         | Years      | Years      |
| \$212,000 | 53.0                   | 67,569 | 0      | \$12,771 | 0           | \$12,771 | \$0         | \$14,527   | 16.6       | 7.8        |

\*\* Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= \$215 /1000kWh

**Area Output\***

350 m2  
3,767 ft2

**Perimeter Output\***

50 m  
164 ft

**Available Roof Space for PV:**

(Area Output - 10 ft x Perimeter) x 85%  
1,808 ft2

**Approximate System Size:**

Is the roof flat? (Yes/No) Yes

8 watt/ft2  
14,463 DC watts  
53 kW Enter into PV Watts

**PV Watts Inputs\*\*\***

Array Tilt Angle 20 Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)  
Array Azimuth 180 Enter into PV Watts (default)  
Zip Code 07003 Enter into PV Watts  
DC/AC Derate Factor 0.83 Enter into PV Watts

**PV Watts Output**

67,569 annual kWh calculated in PV Watts program

**% Offset Calc**

Usage 197,542 (from utilities)  
PV Generation 67,569 (generated using PV Watts )  
% offset 34%



\* <http://www.freemaptools.com/area-calculator.htm>  
\*\* <http://www.flettexchange.com>  
\*\*\* [http://gisatnrel.nrel.gov/PVWatts\\_Viewer/index.html](http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html)

My Location

376 Berkeley Avenue Bloomfield NJ 07003  
» Change Location

Release Notice (?)

HELP

ALL NREL SOLAR TOOLS

▼

RESOURCE DATA   SYSTEM INFO   RESULTS



Go to  
system  
info

67,569 kWh per Year \*

RESULTS

Print Results

| Month     | Solar Radiation<br>( kWh / m <sup>2</sup> / day ) | AC Energy<br>( kWh ) | Energy Value<br>( \$ ) |
|-----------|---------------------------------------------------|----------------------|------------------------|
| January   | 2.78                                              | 3,990                | 294                    |
| February  | 3.52                                              | 4,515                | 333                    |
| March     | 4.34                                              | 6,003                | 443                    |
| April     | 4.95                                              | 6,395                | 472                    |
| May       | 5.69                                              | 7,380                | 545                    |
| June      | 5.86                                              | 7,168                | 529                    |
| July      | 5.73                                              | 7,155                | 528                    |
| August    | 5.47                                              | 6,772                | 500                    |
| September | 4.91                                              | 6,049                | 446                    |
| October   | 3.99                                              | 5,254                | 388                    |
| November  | 2.68                                              | 3,570                | 263                    |
| December  | 2.35                                              | 3,320                | 245                    |
| Annual    | 4.36                                              | 67,571               | \$ 4,986               |

User Comments



 Download Results: [Monthly](#) | [Hourly](#)

[Find A Local Installer](#)



**\* Caution:** Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Similarly, the "Energy Value" column simply multiplies the utility-average electricity price by production. Complex utility rates and financing can significantly impact the energy value. See [Help](#) for additional guidance.

Location and Station Identification

|                     |                                         |
|---------------------|-----------------------------------------|
| Requested Location  | 376 Berkeley Avenue Bloomfield NJ 07003 |
| Weather Data Source | (TMY2) NEWARK, NJ    5.3 mi             |
| Latitude            | 40.7° N                                 |
| Longitude           | 74.17° W                                |

PV System Specifications *(Commercial)*

|                     |                   |
|---------------------|-------------------|
| DC System Size      | 53 kW             |
| Module Type         | Standard          |
| Array Type          | Fixed (open rack) |
| Array Tilt          | 20°               |
| Array Azimuth       | 180°              |
| System Losses       | 14%               |
| Inverter Efficiency | 96%               |
| DC to AC Size Ratio | 1.1               |

Initial Economic Comparison

|                                                    |             |
|----------------------------------------------------|-------------|
| Average Cost of Electricity Purchased from Utility | 0.07 \$/kWh |
| Initial Cost                                       | 2.60 \$/Wdc |
| Cost of Electricity Generated by System            | 0.13 \$/kWh |

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

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

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## **APPENDIX F**

### **Photos**



**FAIR VIEW ELEMENTARY SCHOOL**



**STEAM BOILERS**



**PNEUMATIC SYSTEM CONTROL PANEL**



**AIR PRESSURE REGULATOR**



**CHILLED WATER PUMPS**



**AIR COOLED CHILLER ON ROOF**



**THERMOSTAT**



**DHW HEATER**

## **APPENDIX G**

### **EPA Benchmarking Report**



# ENERGY STAR<sup>®</sup> Statement of Energy Performance

# 39

ENERGY STAR<sup>®</sup>  
Score<sup>1</sup>

## Fair View Elementary School

**Primary Property Function:** K-12 School  
**Gross Floor Area (ft<sup>2</sup>):** 57,950  
**Built:** 1899

**For Year Ending:** June 30, 2014  
**Date Generated:** May 12, 2015

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

### Property & Contact Information

**Property Address**

Fair View Elementary School  
376 Berkeley Avenue  
Bloomfield, New Jersey 07003

**Property Owner**

\_\_\_\_\_  
' ( ) - \_\_\_\_\_

**Primary Contact**

\_\_\_\_\_  
' ( ) - \_\_\_\_\_  
\_\_\_\_\_

**Property ID:** 4424318

### Energy Consumption and Energy Use Intensity (EUI)

**Site EUI**

68 kBtu/ft<sup>2</sup>

**Annual Energy by Fuel**

Electric - Grid (kBtu) 674,013 (17%)  
Natural Gas (kBtu) 3,265,900 (83%)

**National Median Comparison**

National Median Site EUI (kBtu/ft<sup>2</sup>) 61.8  
National Median Source EUI (kBtu/ft<sup>2</sup>) 87  
% Diff from National Median Source EUI 10%

**Source EUI**

95.7 kBtu/ft<sup>2</sup>

**Annual Emissions**

Greenhouse Gas Emissions (Metric Tons CO<sub>2</sub>e/year) 264

### 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)