

**COUNTY OF ESSEX**

**DPW HEADQUARTERS BUILDING**  
900 Bloomfield Avenue, Verona, NJ 07044

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

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**CHA PROJECT NO. 29142**

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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 the DPW Headquarters Building of Essex County 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>DPW Headquarters</b>	900 Bloomfield Ave., Verona, NJ 07044	16,125	1952

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>DPW Headquarters</b>	51,162	1,612	10,195	12.7

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

Each measure recommended by CHA typically has a stand-alone simple payback period of 15 years or less. However, if the owner 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
1	Replace Windows	372,400	2,697	138.1	0	138.1	N
2	Install Window Film	22,300	1,745	12.8	0	12.8	N
3	Door Sweeps & Seals	922	147	3.7	0	3.7	Y
4	Demand Controlled Ventilation	16,700	915	18.3	0	18.3	Y
5	Replace Condensing Unit	8,800	715	12.3	200	12.0	Y
6	Replace Electric DHW Heater with Gas Fired DHW Heater	8,192	644	9.4	300	9.1	Y
7	Low Flow Plumbing Fixtures	18,973	218	87.1	0	87.1	N
L1**	Lighting Replacements	68,646	5,284	13.0	6,470	11.8	N
L2**	Lighting Controls	3,848	1,220	3.2	600	2.7	N
L3	Lighting Replacements with Controls	72,493	5,756	12.6	7,070	11.4	Y
<b>Total**</b>		<b>501,807</b>	<b>12,892</b>	<b>38.9</b>	<b>7,570</b>	<b>38.3</b>	
<b>Total (Recommended)</b>		<b>129,407</b>	<b>10,195</b>	<b>12.7</b>	<b>7,570</b>	<b>12.0</b>	

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

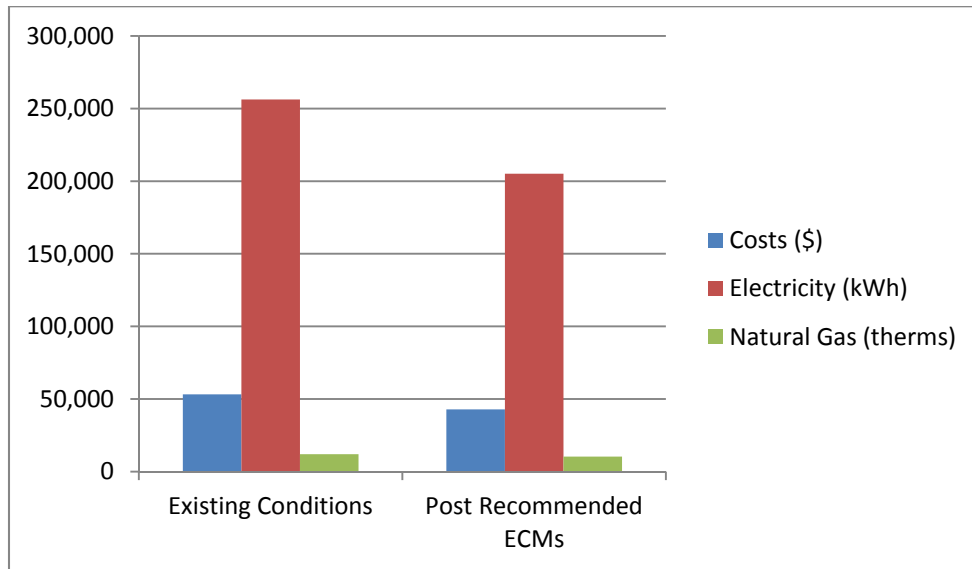
\*\* These ECMs are not included in the Total, as they are alternate measures not recommended.

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

- Photovoltaic (PV) Rooftop Solar Power Generation – 60 kW System

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

	<b>Existing Conditions</b>	<b>Post Recommended ECMs</b>	<b>Percent Savings</b>
Costs (\$)	53,227	43,032	19%
Electricity (kWh)	256,240	205,078	20%
Natural Gas (therms)	11,968	10,356	13%
Site EUI (kbtu/SF/Yr)	128.4	107.6	





## 2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

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

**Building Name:** Department of Public Works Headquarters

**Address:** 900 Bloomfield Avenue, Verona, NJ 07044

**Gross Floor Area:** 16,125 Square Feet

**Number of Floors:** 1

**Year Built:** 1952



**Description of Spaces:** Offices, conference rooms, storage rooms, network room, toilet rooms and restrooms.

**Description of Occupancy:** There are approximately 40 staff members.

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

**Building Usage:** Hours of operation for the DPW Headquarters are 8:30 AM – 4:30 PM Monday through Friday.

### **Building Envelope**

**Construction Materials:** The building is a single story structure constructed of steel framed panelized window walls. Interior walls are primarily sheetrock. The building has not undergone any significant renovations, and exterior walls are insulated per the code at the time of construction (1952).

**Roof:** The roof is flat and surfaced with a white adhered membrane and appears to be in good condition. No roof associated ECMs are considered.

**Windows** The building has aluminum framed single pane windows. Many seals are not intact, and most of the windows are in poor condition. An ECM is included for window replacement.

**Exterior Doors:** Exterior doors for the building are metal with single pane safety glass, as well as solid metal doors. The condition of sweeps and seals is variable—on a few of the utility doors the sweeps and seals are in poor condition. An ECM is evaluated for sweeps and seals on exterior doors.

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

**Heating:** The heating system consists of two (2) Harsco Mach condensing gas boilers with 750,000 BTUH capacity each, and were installed in 2011. Hot water is distributed around the building via two (2) secondary B&G 3.0 HP base mounted pumps that operate in a lead-lag manner, and are controlled by ABB VFD drives. Hot water is pumped to an air handling unit, perimeter convectors and unit heaters. Two (2) fractional HP Grundfos primary pumps circulate hot water through the boilers. A centralized Trane multi-zone air handling unit, equipped with hot deck and cold deck, serves the entire building. This unit distributes conditioned air into seven (7) zones that is delivered via ductwork through ceiling mounted diffusers to all areas of the building. In general, the heating system is adequate and no associated ECMs are included.

**Cooling:** The building is 100% cooled using a 2011 Napps chiller which is located in the Boiler Room. Two (2) 7.5 HP base mounted B&G pumps circulate the chilled water through the cold deck of the Trane multi-zone unit. Chilled water temperature is set to 50°F. Heat is rejected to the exterior utilizing a Baltimore Aircoil Company (BAC) closed circuit cooling tower, located in the Boiler Room. Altogether the building utilizes approximately 50 tons of cooling. One office is air conditioned with a ceiling mounted fan coil that has a split DX condensing unit located on the roof. Nameplate data was not legible on the condensing unit, which appears to be at the end of its useful life. An ECM is included that addresses replacing this condensing unit.

**Ventilation:** The Trane multi-zone unit described above draws in outside air from a large roof-mounted Greenheck ventilator that is delivered to all the interior spaces within the building. In general, building ventilation is adequate and no associated ECMs are included.

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

## **Controls Systems**

DPW Headquarters is managed by a Johnson Controls Metasys BMS system. Each of the seven (7) zones is controlled by its own thermostat. A review of the system indicates that it allows for space temperature set points and scheduling. Economizer operation is incorporated. The heating system is capable of night-time setback, allowing for higher or lower unoccupied space temperatures to consume less energy, depending upon the season. The system ties together all the data at one front end and provides trending, alarms, graphic display, control logic and reports. As it appears the controls are well managed, no ECM is evaluated.

## **Domestic Hot Water Systems**

Although natural gas is available to the building, the one domestic hot water heater is electric, utilizing a Rheem 40 gallon DHW heater with 4500 watts of heating capacity. DHW is used in rest room sinks throughout the building. An ECM for converting the one (1) DHW heater from electric to natural gas is evaluated.

### **Kitchen Equipment**

The building does not have a kitchen or cooking facilities. There is a break room with residential microwaves, refrigerators and other electrical appliances. No ECMs were included for kitchen equipment.

### **Plug Load**

The DPW Headquarters Building has computers, LCD monitors, copiers, smart boards, residential appliances (microwave, refrigerator), printers, and portable heaters which contribute to the plug load in the building.

### **Plumbing Systems**

Plumbing systems include several toilet rooms and a small break-room area. Fixtures in toilets rooms have water consumption amounts of 1.0 GPF for urinals, 1.8 GPF for water closets, and 2.2 GPM for metering type spring-loaded lavatory faucets. Toilet rooms do not have high flow fixtures, but could benefit from some low flow upgrades. An ECM evaluating dual flush flushometers and waterless urinals is evaluated for plumbing system fixtures.

### **Lighting Systems**

The lighting within the DPW Headquarters building consists of 2x4 and 2x2 recessed and ceiling mounted troffers having 32W T8 fluorescent lamps with prismatic lenses. T-12 lamps are found in a few offices, storage areas and stairwells, and a few compact fluorescent and incandescent bulbs were noted. A combination of occupancy sensors and wall switches control the interior lighting. Exterior lighting consists of 150 watt metal halide wall-pack lamps, one of which was on during daytime hours at the time of the site visit.

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

### 3.0 UTILITIES

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

	Electric	Natural Gas
Deliverer	PSE&G	PSE&G
Supplier	PSE&G	Hess Corp.

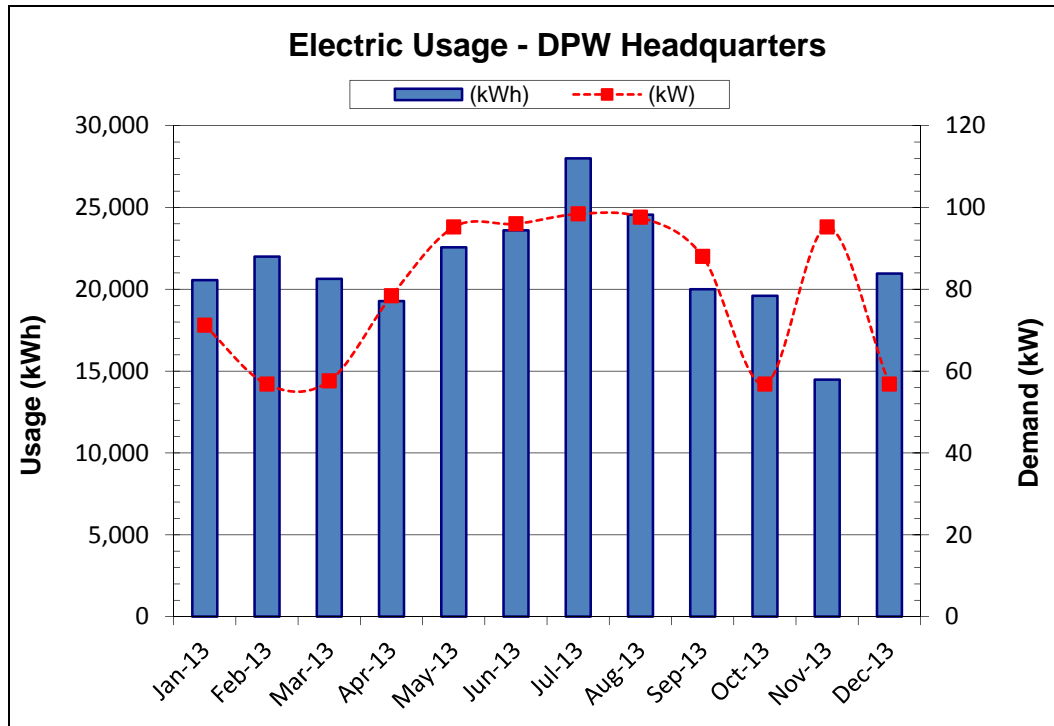
For the 12-month period ending in December 2013, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	256,240	kWh/yr.
Annual Cost	43,314	\$
Blended Unit Rate	0.169	\$/kWh
Supply Rate	0.153	\$/kWh
Demand Rate	4.29	\$/kW
Peak Demand	98.4	kW
Natural Gas		
Annual Usage	11,968	Therms/yr.
Annual Cost	9,913	\$
Rate	0.828	\$/therm

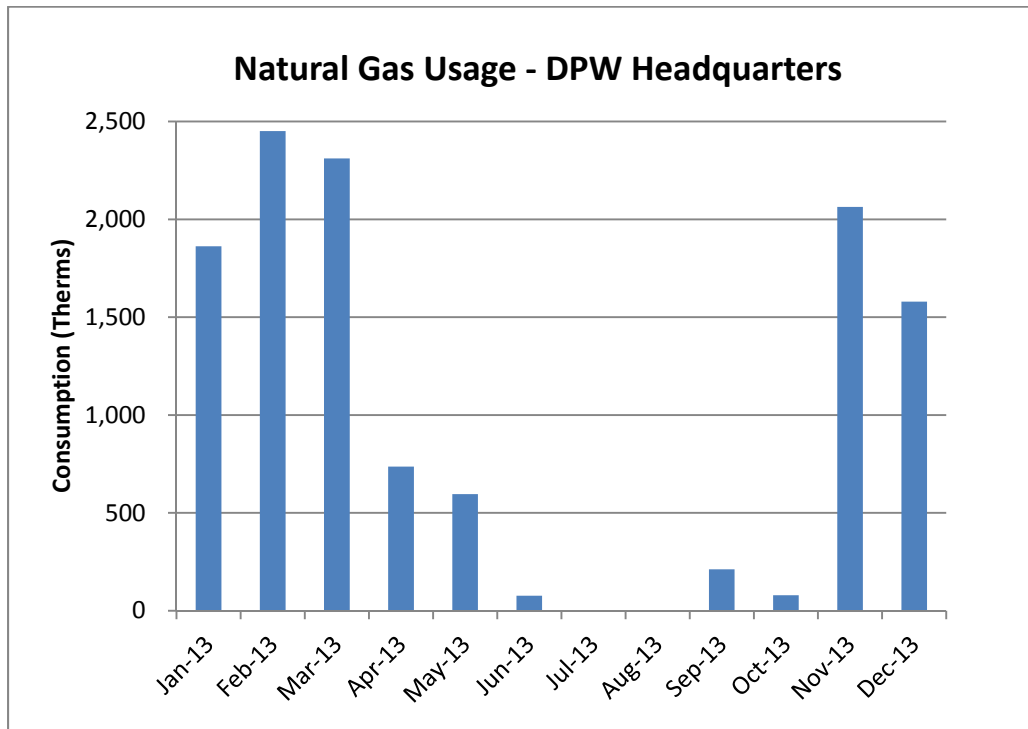
Blended Rate: Average rate charged determined by the annual cost / annual usage

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

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



The electrical usage for this building has peaks in the summer and winter with lower levels in the spring and fall. Summer peaks occur during the maximum cooling season.



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

See Appendix A for utility analysis.

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

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	Building Average Rate	NJ Average Rate	
Electricity	\$/kWh	\$0.17	\$0.13	Y
Natural Gas	\$/Therm	\$0.83	\$0.96	N

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

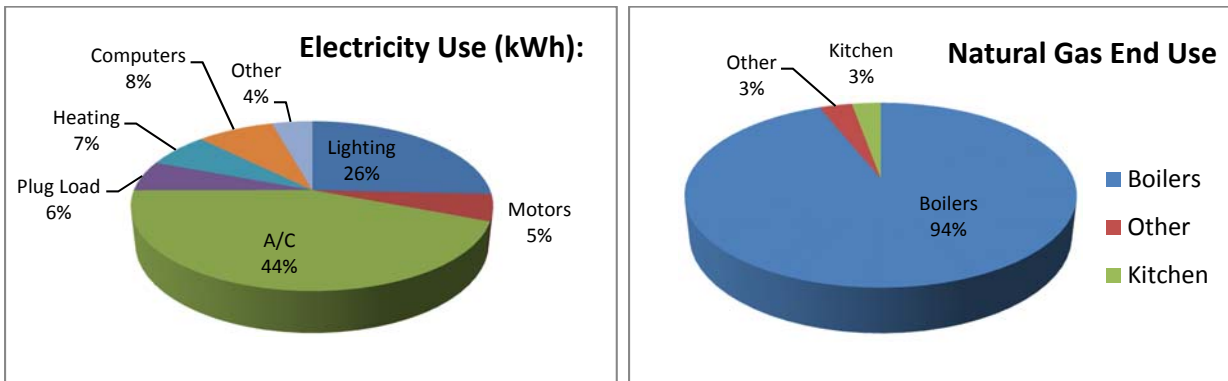
Additional information on selecting a third party energy supplier is available here:

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

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

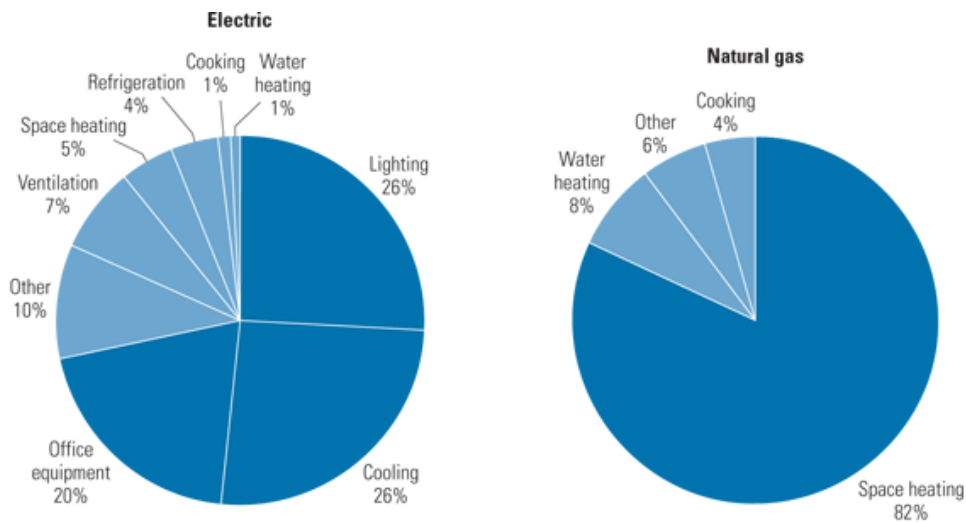
The charts below represent estimated utility end-use utility profiles for the building. The values used within the charts were estimated from a review of the utility analysis and the energy savings calculations.

### Site End-Use Utility Profile



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

### Typical End-Use Utility Profile for Commercial Buildings



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

#### 4.0 BENCHMARKING

The EPA Portfolio Manager benchmarking tool provides a site and source Energy Use Intensity (EUI), as well as an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft<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.

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

Building	Site EUI kBtu/ft <sup>2</sup> /yr	Source EUI Btu/ft <sup>2</sup> /yr	Energy Star Rating (1-100)
DPW Headquarters	128.4	248.2	16

The building has a below average Energy Star Rating Score (50 being the median score). It is likely that one of the largest contributing factors to the low Energy Star Rating is the poor condition of the windows. By implementing the measures discussed in this report, it is expected that the EUI can be reduced and the Energy Star Rating increased.

## 5.0 ENERGY CONSERVATION MEASURES

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

- Energy conservation measures (ECMs) are energy savings recommendations that typically require a financial investment. For these areas of opportunity, CHA prepared detailed calculations, as summarized in this section and in Appendix C. In general, additional savings may exist from reductions in maintenance activities associated with new equipment or better controls; however for conservatism, maintenance savings are not accounted for in this report; instead the only savings which are reported are those derived directly from reductions in energy which can be tracked by the utility bills.
- Operational and Maintenance measures (O&M) consist of low- or no-cost operational opportunities, which if implemented would have positive impacts on overall building operation, comfort levels, and/or energy usage. There are no estimated savings, costs or paybacks associated with the O&M measures included as part of this study.

Energy savings were quantified in the form of:

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

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

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

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



## 5.1 ECM-1 Replace Windows

Approximately 1710 square feet of windows in the building are single pane and generally are in poor condition and can only provide sub-par thermal resistance to heat transfer. Energy loss due to air infiltration occurs between the building and its surroundings, as a result of bad seals and poorly insulated frames. An assessment has been made which considers the installation of triple pane low-e windows with aluminum frames.

The calculation uses bin weather data estimate the occupied and unoccupied bin hours. This is converted to existing energy for the occupied and unoccupied cases using the existing window U-factor and the heating and cooling temperature. The two are summed together to create the annual utility usage for the baseline. The same steps are done to calculate the proposed utility usage. The difference in heating losses through the windows results in annual heating natural gas and cooling electricity savings.

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

### ECM-1 Replace Windows

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$	%	\$	Years	Years
372,400	0	1,305	2,991	2,697	(0.8)	0	138.1	138.1

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

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

## 5.2 ECM-2 Install Window Film

This measure considers installing window film on the windows as a method for reducing solar heat gain. Although not a solution for heat loss and/or infiltration issues, window film can reduce incoming solar radiation by up to 60%. Reduction of solar heat gain will result in a reduced cooling load, thus providing a savings in summertime energy consumption.

The materials involved in this measure have an expected life of 10 years, according to the manufacturer. The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

### ECM-2 Install Window Film

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
22,300	0	10,324	0	1,745	0.2	300	12.8	12.8

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

This measure is recommended.

### 5.3 ECM-3 Replace Door Sweeps and Seals

It was noted during the site visit that the seals and sweeps were showing wear on nearly all of the exterior doors, and daylight was visible between the door and frame.

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

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

#### ECM-3 Replace Door Sweeps & Seals

Budgetary Cost	Annual Utility Savings			ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)	
	Electricity		Natural Gas					Total
\$	kW	kWh	Therms	\$	\$	Years	Years	
922	2.0	159	145	248	4.4	0	3.7	3.7

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

This measure is recommended.

### 5.4 ECM-4 Demand Controlled Ventilation

Individual HVAC systems serving spaces such as office areas or conference rooms typically have the ability to provide ventilation (outdoor) air based on maximum occupancy. In the case of a packaged multi-zone unit serving the building, the outdoor air dampers are typically controlled to provide a fixed amount of outdoor air regardless of the actual occupancy at any given time. This outdoor air needs to be heated or cooled, which requires thermal and electrical energy. By implementing a Demand Controlled Ventilation (DCV) strategy, carbon monoxide sensors are used to monitor carbon dioxide (CO2) levels which then control the outdoor air damper positions to maintain an acceptable level of CO2 (typically 700 parts per million [ppm] or less), which is an indicator of good indoor air quality. As occupancy levels increase, the outdoor air dampers will open and introduce more fresh air. When the space is not occupied, the dampers will close. Energy savings will result from the reduction in heating and cooling of the outdoor air.

The energy savings calculated below are based on estimated outdoor air flow rates and the average reduction in outdoor air flow that would occur when implementing DCV. A more detailed study is required to determine actual ventilation flow rates, space ventilation requirements, and room usage scheduling to determine more accurate energy savings potential.

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

**ECM-4 Demand Controlled Ventilation**

Budgetary Cost	Annual Utility Savings			ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)	
	Electricity		Natural Gas					Total
\$	kW	kWh	Therms	\$	%	\$	Years	Years
16,700	0	3,362	418	915	(0.5)	0	18.3	18.3

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

This measure is recommended.

**5.5 ECM-5 Replace Condensing Unit with High EER Condensing Unit**

The DPW Headquarters has one (1) split DX Coleman Evcon condensing unit located on the roof. This unit is past its useful life. It is recommended that this unit be replaced with a new model that will operate at a higher energy efficiency ratio (EER). This ECM assesses the replacement of the condensing unit in question and provides the resulting energy savings.

It is assumed in the performance of this calculation that the operating hours, number of units, and capacity stays the same. The energy savings result from properly operating units and higher efficiency units over existing units.

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

**ECM-5 Replace Condensing Unit with High EER Condensing Unit**

Budgetary Cost	Annual Utility Savings			ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)	
	Electricity		Natural Gas					Total
\$	kW	kWh	Therms	\$	%	\$	Years	Years
8,800	1.0	4,337	0	715	0.3	200	12.3	12.0

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

This measure is recommended.

**5.6 ECM-6 Replace Electric DHW with a Gas Fired DHW Heater**

Domestic hot water (DHW) is generated by a 40 gallon Rheem electric water heater. Although energy efficient, electric DHW heaters are typically more expensive to operate due to the higher price per kWh. A further consideration is the cost of water storage. According to the U.S. Department of Energy, 2.5% of stored thermal capacity is lost every hour during DHW heater standby. In other words, stored hot water that is not being used loses heat unnecessarily to the surroundings.

Converting an electric DHW heater to a condensing natural gas unit will result in an annual cost savings. The new water heater requires domestic water piping and exhaust venting that will necessitate modifications to floors, walls, and ceilings.

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

**ECM-6 Domestic Hot Water System Improvements**

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
8,192	-	-	1,048	868	0.6	300	9.4	9.1

This measure is recommended.

**5.7 ECM-7 Install Low Flow Plumbing Fixtures**

Most of the lavatory and urinal plumbing fixtures in this building are of the newer low flow variety. Lavatory faucets have low-flow metering valves and urinals are 1.0 gpf. The toilets, however, have 1.6 gpf flush valves, and could be upgraded to a lower flow flush valve. The water savings associated from replacing existing flow lavatory fixtures with low-flow fixtures was calculated by taking the difference of the annual water usage for the proposed and base case. The basis of this calculation is the estimate usage of each fixture, gallons per use, and number of fixtures.

Replacing the existing fixtures in the restrooms with waterless urinals will conserve water, which will result in lower annual water and sewer charges.

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

**ECM-7 Install Low Flow Plumbing Fixtures**

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Water	Total				
\$	kW	kWh	Therms	kGal	\$		\$	Years	Years
18,973	0	0	0	23	218	(0.7)	0	87.1	87.1

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

These measures are not recommended due to the long paybacks.

**5.8.1 ECM-L1 Lighting Replacement / Upgrades**

The lighting within the DPW Headquarters offices consists of 2x4 and 2x2 recessed and ceiling mounted troffers having 32W T8 fluorescent lamps with prismatic lenses. Several areas also contain recessed cans outfitted with compact fluorescent lamps. The Council

Chambers also contains CFLs inside decorative wall mounted sconces, as well as PAR track lighting. T-12 lamps are found in storage areas and stairwells, and a few compact fluorescent and incandescent bulbs were noted. A combination of occupancy sensors and wall switches control the interior lighting.

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

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

**ECM-L1 Lighting Replacement / Upgrades**

Budgetary Cost	Annual Utility Savings			ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)	
	Electricity		Natural Gas					Total
\$	kW	kWh	Therms	\$	\$	Years	Years	
68,646	13.8	29,895	0	5,284	(0.2)	6,470	13.0	11.8

\* 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.

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

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

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

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

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

Budgetary Cost	Annual Utility Savings	ROI	Potential Incentive*	Payback	Payback
----------------	------------------------	-----	----------------------	---------	---------

	Electricity		Natural Gas	Total			(without incentive)	(with incentive)	
	\$	kW	kWh	Therms			\$	\$	Years
	3,848	0	7,971	0	1,220	2.5	600	3.2	2.7

\* 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.

### 5.8.3 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	
72,493	13.8	32,981	0	5,756	(0.1)	7,070	12.6	11.4

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

This measure is recommended.

### 5.9 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:

- Set computers monitors to turn off and computers to sleep mode when not in use
- Look for the ENERGY STAR® label when purchasing Window AC units or Kitchen Appliances
- Disconnect unnecessary or unused small appliances and electronics when not in use to reduce phantom loads
- Train staff to turn off lights when rooms are unoccupied
- Develop an Energy Master Plan to measure and track energy performance
- During the winter at the end of the day, staff should ensure all windows are closed as part of a basic routine.



## **6.0 PROJECT INCENTIVES**

### **6.1 Incentives Overview**

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

#### **6.1.1 New Jersey Smart Start Program**

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

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

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

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

#### **6.1.2 Direct Install Program**

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

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

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

The program pays a maximum amount of \$75,000 per building, and up to \$250,000 per customer per year. Installations must be completed by an approved Direct Install



participating contractor, a list of which can be found on the New Jersey Clean Energy Website. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this energy audit. The incentive is reimbursed to the Owner upon successful replacement and payment of the equipment.

The building qualifies for this program because its electrical demand is less than the maximum peak electrical demand of 200 kW for the last 12 month period.

Refer to Appendix D for more information on this program.

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

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

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

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

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

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

#### Electric

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

#### Gas

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

Incentive cap: 25% of total project cost

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

#### Electric

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

#### Gas

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

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

For the purpose of demonstrating the eligibility of the ECM's to meet the minimum savings requirement of 15% annual savings and 10% 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)
8,576	60

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

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey Solar Renewable Energy Certificates Program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. Payments that will be received by the PV producer (school) will change from year to year dependent upon supply and demand. There is no definitive way to calculate an exact price that will be received by the PV producer for SREC credits over the next 15 years. Renewable Energy Consultants estimates an average of \$155/SREC for 2014 and this number was utilized in the cash flow for this report.

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

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

#### **Photovoltaic (PV) Rooftop Solar Power Generation – 50 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
240,000	60.0	79,455	0	13,428	13,507	17.9	8.9	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 hospital should consult with a certified solar PV contractor, and replace the roof.

### 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.

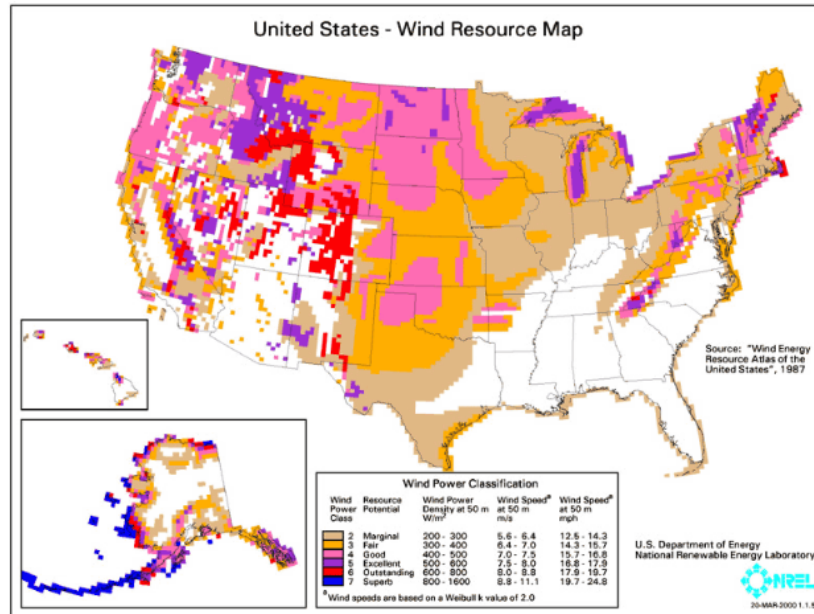
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping).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

#### 7.4 Demand Response Curtailment

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

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

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

#### Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
98.4	55.8	79.0	N	N

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

## 8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for Essex County's DPW Headquarters Building.

The following projects should be considered for implementation:

- Replace Door Sweeps and Seals
- Demand Controlled Ventilation
- Replace Condensing Unit
- Replace Electric DHW Heater
- 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>
51,162	1,612	10,195	12.7

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

	<b>Existing Conditions</b>	<b>Post Recommended ECMs</b>	<b>Percent Savings</b>
Costs (\$)	53,227	43,032	19%
Electricity (kWh)	256,240	205,078	20%
Natural Gas (therms)	11,968	10,356	13%
Site EUI (kbtu/SF/Yr)	128.4	107.6	

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

- Photovoltaic (PV) Rooftop Solar Power Generation – 60 kW System

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



## **APPENDIX A**

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

**Essex County  
DPW Headquarters**

**Annual Utilities  
12-month Summary**

<b>Electric</b>		
Annual Usage	256,240	kWh/yr
Annual Cost	43,314	\$
Blended Rate	0.169	\$/kWh
Consumption Rate	0.153	\$/kWh
Demand Rate	4.29	\$/kW
Peak Demand	98.4	kW
Min. Demand	56.8	kW
Avg. Demand	79.0	kW
<b>Natural Gas</b>		
Annual Usage	11,968	Therms/yr
Annual Cost	9,913	\$
Rate	0.828	\$/Therm

**Essex County  
DPW Headquarters**

**Utility Bills: Account Numbers**

<u>Account Number</u>	<u>Building</u>	<u>Location</u>	<u>Type</u>	<u>Notes</u>
6917690406	DPW Headquarters	900 Bloomfield Avenue, Verona, NJ 07044	Electricity	
PG000010211534244121	DPW Headquarters	900 Bloomfield Avenue, Verona, NJ 07044	Natural Gas	
	DPW Headquarters	900 Bloomfield Avenue, Verona, NJ 07044	Water	

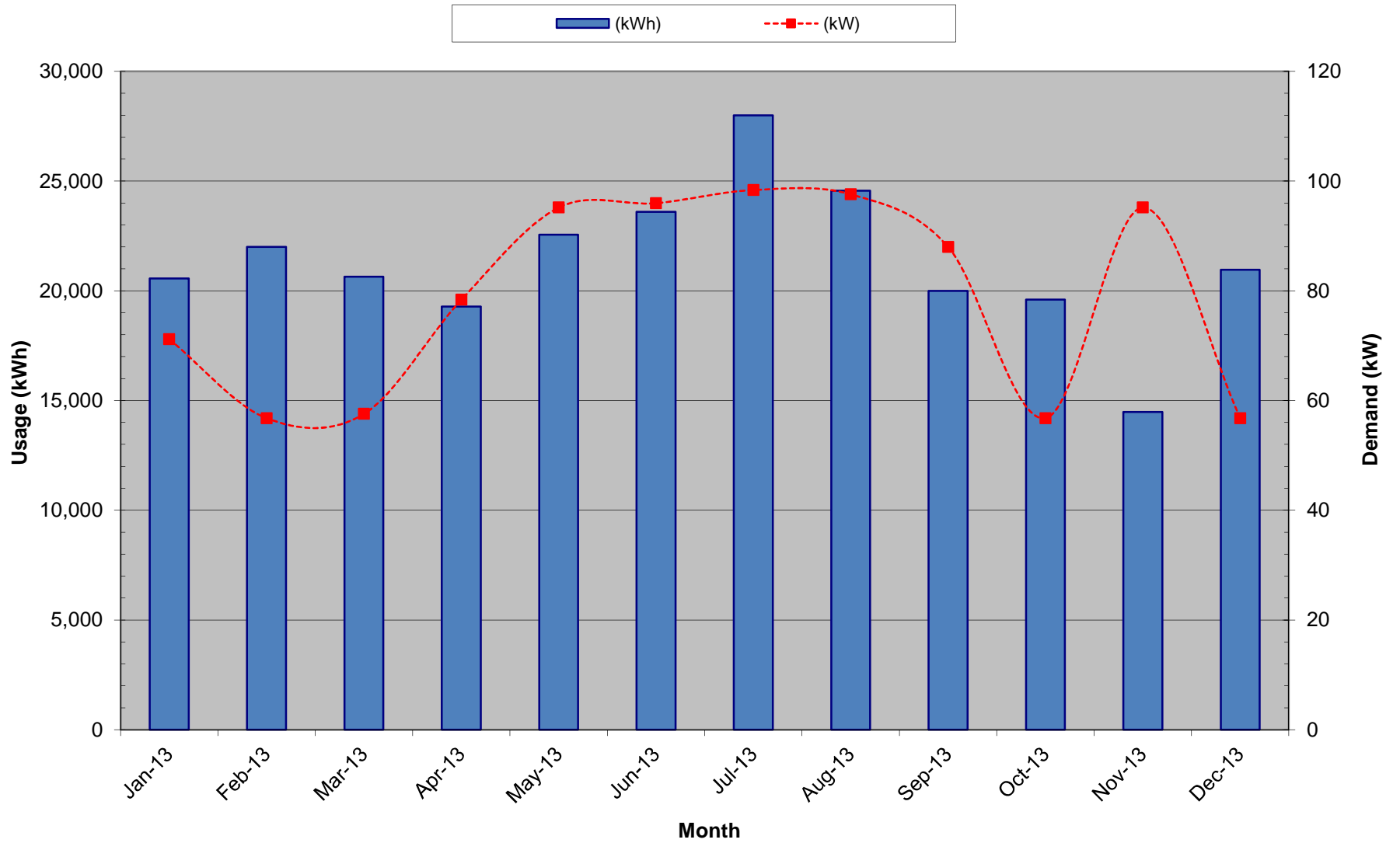
Essex County  
DPW Headquarters

For Service at: 900 Bloomfield Avenue, Verona, NJ 07044  
 Account No.: 6917690406 Delivery - PSE&G  
 Meter No.: 728012082 Supplier - N/A  
 Electric Service

Month	Usage (kWh) vs. Demand (kW) Charges		Provider Charges			Unit Costs				
	Consumption (\$)	Demand (\$)	Delivery (\$)	Supplier (\$)	Total (\$)	Blended Rate (\$/kWh)	Consumption (\$/kWh)	Demand (\$/kW)		
January-13	20,560	71.20	1,006.51	2,158.80	3,165.31	2,859.86	305.45	0.15	0.14	4.29
February-13	22,000	56.80	951.86	2,310.00	3,261.86	3,018.19	243.67	0.15	0.14	4.29
March-13	20,640	57.60	911.74	2,167.20	3,078.94	2,831.84	247.10	0.15	0.14	4.29
April-13	19,280	78.40	957.22	2,024.40	2,981.62	2,645.28	336.34	0.15	0.14	4.29
May-13	22,560	95.20	2,043.32	2,368.80	4,412.12	4,003.71	408.41	0.20	0.18	4.29
June-13	23,600	96.00	2,134.86	2,478.00	4,612.86	4,201.02	411.84	0.20	0.18	4.29
July-13	28,000	98.40	2,342.64	2,940.00	5,282.64	4,860.50	422.14	0.19	0.17	4.29
August-13	24,560	97.60	2,193.37	2,578.80	4,772.17	4,353.47	418.70	0.19	0.18	4.29
September-13	20,000	88.00	1,061.77	2,100.00	3,161.77	2,784.25	377.52	0.16	0.14	4.29
October-13	19,600	56.80	971.45	2,058.00	3,029.45	2,785.78	243.67	0.15	0.14	4.29
November-13	14,480	95.20	889.45	1,520.40	2,409.85	2,001.44	408.41	0.17	0.14	4.29
December-13	20,960	56.80	944.12	2,200.80	3,144.92	2,901.25	243.67	0.15	0.14	4.29
<b>Total (All)</b>	<b>256,240</b>	<b>98.40</b>	<b>\$16,408.31</b>	<b>\$26,905.20</b>	<b>\$43,313.51</b>	<b>\$39,246.59</b>	<b>\$4,066.92</b>	<b>\$0.17</b>	<b>\$0.15</b>	<b>\$4.29</b>
<b>Total (last 12-months)</b>	<b>256,240</b>	<b>98.40</b>	<b>\$16,408.31</b>	<b>\$26,905.20</b>	<b>\$43,313.51</b>	<b>\$39,246.59</b>	<b>\$4,066.92</b>	<b>\$0.17</b>	<b>\$0.15</b>	<b>\$4.29</b>

- |       |   |   |   |   |   |   |   |   |   |    |
|-------|---|---|---|---|---|---|---|---|---|----|
| Notes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|---|---|---|---|---|---|---|---|---|----|
- 1.) Number of kWh of electric energy used per month
  - 2.) Number of kW of power measured
  - 3.) Electric charges from Delivery provider
  - 4.) Electric charges from Supplier
  - 5.) Total charges (Delivery + Supplier)
  - 6.) Charges based on the number of kWh of electric energy used \$0.105 /kWh
  - 7.) Charges based on the number of kW of power measured Estimated supply rate due to missing data
  - 8.) Total Charges (\$) / Consumption (kWh)
  - 9.) Consumption Charges (\$) / Consumption (kWh)
  - 10.) Demand Charges (\$) / Demand (kW)

### Electric Usage - DPW Headquarters



**Essex County  
DPW Headquarters**

**For Service at:** 900 Bloomfield Avenue  
**Account No.:** PG000010211534244121  
**Meter No:** 2916026

**Natural Gas Service**

**Delivery - PSEG  
 Supplier - Hess Corp.**

Month	Consumption (Therms)	Charges			Unit Costs		
		Delivery (\$)	Supply (\$)	Total (\$)	Delivery (\$/Therm)	Supply (\$/Therm)	Total (\$/Therm)
January-13	1,862	\$ 784.27	\$ -	\$ 784.27	\$ 0.421	\$ -	\$ 0.421
February-13	2,451	\$ 997.24	\$ -	\$ 997.24	\$ 0.407	\$ -	\$ 0.407
March-13	2,311	\$ 384.14	\$ -	\$ 384.14	\$ 0.166	\$ -	\$ 0.166
April-13	736	\$ 207.53	\$ 3,003.21	\$ 3,210.74	\$ 0.282	\$ 4.078	\$ 4.360
May-13	596	\$ 213.26	\$ 439.64	\$ 652.90	\$ 0.358	\$ 0.737	\$ 1.095
June-13	77	\$ 37.62	\$ 135.41	\$ 173.03	\$ 0.488	\$ 1.756	\$ 2.244
July-13	0	\$ 11.27	\$ 1.32	\$ 12.59	#DIV/0!	#DIV/0!	#DIV/0!
August-13	0	\$ 11.27	\$ -	\$ 11.27	#DIV/0!	#DIV/0!	#DIV/0!
September-13	212	\$ 83.57	\$ -	\$ 83.57	\$ 0.394	\$ -	\$ 0.394
October-13	79	\$ 345.52	\$ 8.65	\$ 354.17	\$ 4.365	\$ 0.109	\$ 4.474
November-13	2,063	\$ 825.03	\$ 148.30	\$ 973.33	\$ 0.400	\$ 0.072	\$ 0.472
December-13	1,580	\$ 718.69	\$ 1,557.10	\$ 2,275.79	\$ 0.455	\$ 0.986	\$ 1.441
<b>Total</b>	<b>11,968</b>			<b>\$ 9,913.04</b>			<b>\$ 0.828</b>

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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## **APPENDIX B**

### **Equipment Inventory**



Cost of Electricity: \$0.153 \$/kWh  
\$4.29 \$/kW

EXISTING CONDITIONS												Retrofit Control	Notes
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	Usage Describe Usage Type using Operating Hours	No. of Fixtures No. of fixtures before the retrofit	Standard Fixture Code Lighting Fixture Code	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control Pre-inst. control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/space) * (Annual Hours)	Retrofit control device		
227LED	Exterior lighting	Outdoor Lighting	8	70 W MH Wall Pack	MH70/1	95	0.76	Breaker	4368	3,320	PHC		
35LED	Office	Offices	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	OCC	2400	864	none		
41LED	(2) Offices	Offices	7	1B 40 R F 2 (MAG)	F42SS	94	0.66	SW	2400	1,579	OCC		
35LED	Front corridor	Hallways	2	T 32 R F 3 (ELE)	F43ILL/2	90	0.18	Breaker	2280	410	none		
35LED	Main Rear Office	Offices	27	T 32 R F 3 (ELE)	F43ILL/2	90	2.43	OCC	2400	5,832	none		
35LED	Rear Corridor Office	Offices	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.45	SW	2400	1,080	OCC		
35LED	Men's Room	Restroom w/ OCC	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	OCC	1000	270	none		
55LED	Corridor	Hallways	1	2T 17 R F 3 (ELE)	F23ILL	47	0.05	Breaker	2280	107	none		
35LED	Storage Room	Storage Areas	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	1000	270	none		
232	Basement Stairs	Stairway	2	R 60 C 1 1	I60/1	60	0.12	SW	3200	384	none		
264LED	Basement Hall	Hallways	2	Elevator Halogen 20W	HLV20/1	30	0.06	Breaker	2280	137	none		
40LED	Reproduction Room	Storage Areas	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	1000	240	OCC		
40LED	Hallway	Hallways	1	T 32 R F 2 (ELE)	F42LL	60	0.06	Breaker	2280	137	none		
40LED	Main Room	Storage Areas	24	T 32 R F 2 (ELE)	F42LL	60	1.44	SW	1000	1,440	OCC		
40LED	Main Room	Storage Areas	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	1000	120	OCC		
40LED	Basement Storage	Storage Areas	25	T 32 R F 2 (ELE)	F42LL	60	1.50	SW	1000	1,500	OCC		
40LED	Basement Boiler Room	Boiler Room	8	T 32 R F 2 (ELE)	F42LL	60	0.48	SW	1820	874	none		
232	Basement Boiler Room	Boiler Room	2	R 60 C 1 1	I60/1	60	0.12	SW	1820	218	none		
40LED	1st Floor Room 32	Offices	2	T 32 R F 2 (ELE)	F42LL	60	0.12	OCC	2400	288	none		
35LED	Conference Room	Conference	9	T 32 R F 3 (ELE)	F43ILL/2	90	0.81	SW	1200	972	OCC		
35LED	Through Corridor	Hallways	11	T 32 R F 3 (ELE)	F43ILL/2	90	0.99	Breaker	2280	2,257	none		
35LED	Office #23	Offices	8	T 32 R F 3 (ELE)	F43ILL/2	90	0.72	SW	2400	1,728	OCC		
55LED	Office #23	Offices	1	2T 17 R F 3 (ELE)	F23ILL	47	0.05	SW	2400	113	OCC		
41LED	Conference Room	Conference	3	1B 40 R F 2 (MAG)	F42SS	94	0.28	SW	1200	338	OCC		
40LED	Hallway	Hallways	1	T 32 R F 2 (ELE)	F42LL	60	0.06	Breaker	2280	137	none		
41LED	Copy Room	Offices	2	1B 40 R F 2 (MAG)	F42SS	94	0.19	SW	2400	451	OCC		
41LED	Drawings Storage Room	Storage Areas	8	1B 40 R F 2 (MAG)	F42SS	94	0.75	SW	1000	752	OCC		
41LED	Office	Offices	9	1B 40 R F 2 (MAG)	F42SS	94	0.85	SW	2400	2,030	OCC		
41LED	Main office suite	Offices	9	1B 40 R F 2 (MAG)	F42SS	94	0.85	SW	2400	2,030	OCC		
41LED	4 small offices	Offices	12	1B 40 R F 2 (MAG)	F42SS	94	1.13	SW	2400	2,707	OCC		
35LED	4 small offices	Offices	8	T 32 R F 3 (ELE)	F43ILL/2	90	0.72	SW	2400	1,728	OCC		
35LED	Corridor	Hallways	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	Breaker	2280	616	none		
35LED	Ladies Room	Restroom w/ OCC	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	OCC	1000	90	none		
35LED	Office of Senior Services	Offices	7	T 32 R F 3 (ELE)	F43ILL/2	90	0.63	SW	2400	1,512	OCC		
35LED	Office	Offices	5	T 32 R F 3 (ELE)	F43ILL/2	90	0.45	SW	2400	1,080	OCC		
35LED	Men's Room	Restroom w/ OCC	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	OCC	1000	270	none		
35LED	Corridor	Hallways	7	T 32 R F 3 (ELE)	F43ILL/2	90	0.63	Breaker	2280	1,436	none		
35LED	Fiscal Unit	Offices	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	2400	864	OCC		
35LED	Office	Offices	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	2400	864	OCC		
35LED	Kitchenette area	Break/Lunch Rooms	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	3102.5	279	OCC		
35LED	Office 21	Offices	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	2400	864	OCC		
55LED	Corridor	Hallways	2	2T 17 R F 3 (ELE)	F23ILL	47	0.09	Breaker	2280	214	none		
35LED	Copy Room	Offices	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	2400	864	OCC		
35LED	Office	Offices	4	T 32 R F 3 (ELE)	F43ILL/2	90	0.36	SW	2400	864	OCC		
35LED	Corridor	Hallways	11	T 32 R F 3 (ELE)	F43ILL/2	90	0.99	Breaker	2280	2,257	none		
35LED	Utility Room	Mechanical Room	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	1000	270	none		
35LED	Notary Public	Offices	1	T 32 R F 3 (ELE)	F43ILL/2	90	0.09	SW	2400	216	OCC		
35LED	Director's Office	Offices	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	2400	648	OCC		
264LED	*	Offices	8	Elevator Halogen 20W	HLV20/1	30	0.24	SW	2400	576	OCC		
35LED	Office #11	Offices	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	2400	648	OCC		
35LED	Office #12	Offices	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	2400	648	OCC		
35LED	Office #14	Offices	3	T 32 R F 3 (ELE)	F43ILL/2	90	0.27	SW	2400	648	OCC		
<b>Total</b>			<b>297</b>				<b>24.07</b>			<b>50,043</b>			

## **APPENDIX C**

### **ECM Calculations**

Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
\$ 0.169	\$/kWh blended		0.000420205	16,125	Electric	Natural Gas	Fuel Oil
\$ 0.153	\$/kWh supply	256,240	0.000420205		\$ 43,314	\$ 9,913	
\$ 4.29	\$/kW	79.0					
\$ 0.83	\$/Therm	11,968	0.00533471				
\$ 9.63	\$/kgals	90	0				
	\$/Gal						

**DPW Headquarters**

Recommend? Y or N	Item	Savings					Cost	Simple Payback	Life Expectancy	Equivalent CO <sub>2</sub> (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings					ROI	NPV	IRR	
		kW	kWh	therms	No. 2 Oil gal	Water kgal								\$	kW	kWh	therms	kgal/vr				\$
N	ECM-1 Window Replacements	0.0	1,305	2,991	0	0	2,697	\$ 372,400	138.1	25.0	16.5	N	138.1	0.0	32,622	74,774	0	\$ 67,426	(0.8)	(\$325,436)	-10.3%	
Y	ECM-2 Install Window Film	0.0	10,324	0	0	0	1,745	\$ 22,300	12.8	15.0	4.3	N	12.8	0.0	154,857	0	0	\$ 26,171	0.2	(\$1,472)	2.1%	
Y	ECM-3 Door Sweeps and Seals	0.0	159	145	0	0	147	\$ 922	6.3	20.0	0.8	\$ -	6.3	0.0	3,177	2,901	0	\$ 2,939	2.2	\$1,264	15.0%	
Y	ECM-4 Demand Controlled Ventilation	0.0	3,362	418	0	0	915	\$ 16,700	18.3	10.0	3.6	N	18.3	0.0	33,621	4,184	0	\$ 9,146	(0.5)	(\$8,898)	-9.7%	
Y	ECM-5 Replace Condensing Unit	1.0	4,337	0	0	0	715	\$ 8,800	12.3	15.0	1.8	\$ 200	12.0	15.1	65,048	0	0	\$ 11,769	0.3	(\$62)	2.9%	
Y	ECM-6 Replace Electric DHW Heater with Condensing DHW Heater	5.0	2,944	(77)	0	0	644	\$ 8,192	12.7	15.0	0.8	\$ 300	12.3	75.0	44,155	(1,151)	0	\$ 10,370	0.265861	(\$201)	2.6%	
N	ECM-7 Install Low Flow Plumbing Fixtures	0.0	0	0	0	23	218	\$ 18,973	87.1	25.0	0.0	N	87.1	0.0	0	0	566	\$ 5,448	(0.7)	(\$15,178)	-7.9%	
N	ECM-L1 Lighting Replacements / Upgrades	13.8	29,895	0	0	0	5,284	\$ 68,646	13.0	10.0	12.6	\$ 6,470	11.8	138.0	298,950	0	0	\$ 57,627	(0.2)	(\$17,102)	-2.9%	
N	ECM-L2 Install Lighting Controls (Add Occupancy Sensors)	0.0	7,971	0	0	0	1,220	\$ 3,848	3.2	10.0	3.3	\$ 600	2.7	0.0	79,710	0	0	\$ 13,471	2.5	\$7,159	35.8%	
Y	ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)	13.8	32,981	0	0	0	5,756	\$ 72,493	12.6	10.0	13.9	\$ 7,070	11.4	138.0	329,810	0	0	\$ 62,842	(0.1)	(\$16,323)	-2.3%	
<b>Total (Not Including ECMs L1, L2)</b>		<b>19.8</b>	<b>55,411</b>	<b>3,478</b>	<b>0</b>	<b>0</b>	<b>\$ 12,619</b>	<b>\$ 501,807</b>	<b>39.8</b>	<b>13.8</b>	<b>59</b>	<b>\$ 7,570</b>	<b>39.2</b>	<b>228</b>	<b>663,288</b>	<b>80,708</b>	<b>-</b>	<b>\$190,663</b>	<b>(0.6)</b>	<b>(\$360,037)</b>	<b>-13.0%</b>	
<b>Recommended Measures (highlighted green above)</b>		<b>19.8</b>	<b>54,106</b>	<b>487</b>	<b>0</b>	<b>0</b>	<b>\$ 9,922</b>	<b>\$ 129,407</b>	<b>13.0</b>	<b>12.1</b>	<b>25</b>	<b>\$ 7,570</b>	<b>0</b>	<b>12.3</b>	<b>228</b>	<b>630,667</b>	<b>5,934</b>	<b>-</b>	<b>\$123,237</b>	<b>(0.0)</b>	<b>(\$23,076)</b>	<b>-0.4%</b>
<b>% of Existing</b>		<b>25%</b>	<b>21.12%</b>	<b>4.07%</b>	<b>0</b>	<b>0</b>																

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

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

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

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

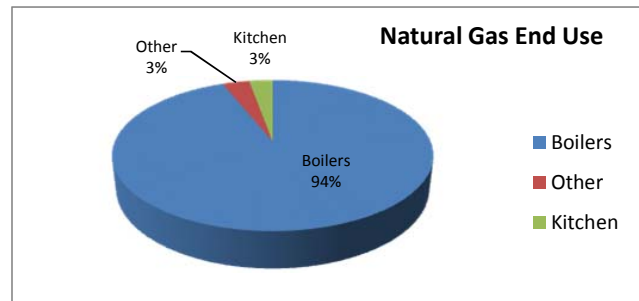
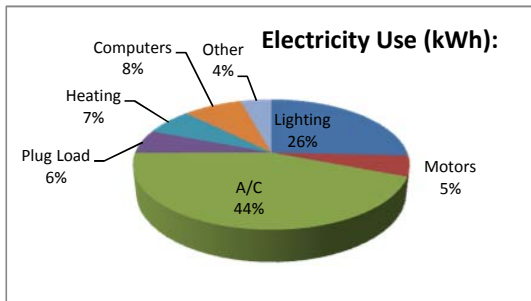
Cooling	
Hours	4,333 Hrs
Weighted Avg	68 F
Avg	78 F

### Utility End Use Analysis

Electricity Use (kWh):		Notes/Comments:
256,240	Total	Based on utility analysis
66,000	Lighting	From Lighting Calculations
13,050	Motors	Estimated
113,000	A/C	Estimated
15,000	Plug Load	Estimated
17,100	Heating	Estimated
21,000	Computers	Estimated
11,090	Other	Remaining
<b>Natural Gas Use (Therms):</b>		<b>Notes/Comments:</b>
11,968	Total	Based on utility analysis
11,618	Boilers	Therms/SF x Square Feet Served
400	Other	Based on utility analysis
350	Kitchen	Based on utility analysis

0.257571027  
 0.050928817  
 0.440992819  
 0.05853887  
 0.066734312  
 0.081954418  
 0.043279738

0.970755348  
 0.03342246  
 0.029244652





**ECM-1: Window Replacement**

Existing: Windows are not properly sealed. This can lead to increased energy consumption due to infiltration/exfiltration and heat gain/loss.  
 Proposed: Install weather strip or caulking to properly seal windows

Linear Feet of window Edge	1,800.0 LF	Cooling System Efficiency	1.2 kW/ton	Heating System Efficiency	80%
Area of window glass	1,710.0 SF	Ex Occupied Clng Temp.	74 °F	Heating On Temp.	55 °F
Existing Infiltration Factor	0.20 cfm/LF	Ex Unoccupied Clng Temp.	74 °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	1.13 Btu/h/SF°F	Cooling Unocc Enthalpy Setpoint	27.5 Btu/lb	Electricity	\$ 0.169 \$/kWh
Proposed U Value	0.45 Btu/h/SF°F			Natural Gas	\$ 0.83 \$/therm

Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Unoccupied			EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
		Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Occupied Window Infiltration & Heat Load BTUH	Unoccupied Window Infiltration & Heat Load BTUH	Occupied Window Infiltration & Heat Load BTUH	Unoccupied Window Infiltration & Heat Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Therms	Proposed Heating Energy Therms
102.5	50.1	0	0	0	-91,683	-91,683	-40,237	-40,237	0	0	0	0
97.5	42.5	6	2	4	-69,709	-69,709	-30,233	-30,233	42	18	0	0
92.5	39.5	45	16	29	-55,188	-55,188	-23,956	-23,956	248	108	0	0
87.5	36.6	146	52	94	-40,828	-40,828	-17,759	-17,759	596	259	0	0
82.5	34.0	298	106	192	-26,955	-26,955	-11,806	-11,806	804	352	0	0
77.5	31.6	476	170	306	-13,405	-13,405	-6,014	-6,014	638	286	0	0
72.5	29.2	662	237	426	0	0	0	0	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	45,261	45,261	18,796	18,796	0	0	378	157
47.5	16.2	659	235	424	56,867	56,867	23,616	23,616	0	0	469	195
42.5	14.4	685	245	441	68,472	68,472	28,435	28,435	0	0	587	244
37.5	12.6	739	264	475	80,078	80,078	33,255	33,255	0	0	740	307
32.5	10.7	717	256	461	91,683	91,683	38,074	38,074	0	0	822	341
27.5	8.6	543	194	349	103,289	103,289	42,894	42,894	0	0	701	291
22.5	6.8	318	114	205	114,894	114,894	47,713	47,713	0	0	457	190
17.5	5.5	245	88	158	126,500	126,500	52,533	52,533	0	0	388	161
12.5	4.1	156	56	100	138,105	138,105	57,352	57,352	0	0	269	112
7.5	2.6	92	33	59	149,711	149,711	62,172	62,172	0	0	172	72
2.5	1.0	36	13	23	161,316	161,316	66,991	66,991	0	0	73	30
-2.5	0.0	19	7	12	172,922	172,922	71,811	71,811	0	0	41	17
-7.5	-1.5	8	3	5	184,527	184,527	76,630	76,630	0	0	18	8
<b>TOTALS</b>		<b>8,760</b>	<b>3,129</b>	<b>5,631</b>					<b>2329</b>	<b>1024</b>	<b>5,115</b>	<b>2,124</b>

Existing Window Infiltration	360 cfm	Savings	2,991 Therms	\$ 2,477
Existing Window Heat Transfer	1,932 Btu/h°F		1,305 kWh	\$ 221
Proposed Window Infiltration	180 cfm			
Proposed Window Heat Transfer	770 Btu/h°F			\$ 2,697

Window ID	Location	Quantity	Width (ft)	Height (ft)	Linear Feet (LF)	Area (SF)	Infiltration Rate (CFM/LF)	U Value (Btu/h/SF°F)	Infiltration (CFM)	Heat Transfer (Btu/h°F)
1	building	90	3	6	1620.0	1620.0	0.2	1.13	324.0	1830.6
2	building	20	3	1.5	180.0	90.0	0.2	1.13	36.0	101.7
<b>Total</b>		<b>110</b>	<b>6</b>	<b>7.5</b>	<b>1,800.0</b>	<b>1,710.0</b>	<b>0.20</b>	<b>1.13</b>	<b>360.0</b>	<b>1932.3</b>

Essex County  
 CHA Project Number: 29142  
 DPW Headquarters

Multipliers	
Material:	1.03
Labor:	1.35
Equipment:	1.10

**ECM-1 Replace Windows - Cost**

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Window Replacement	1,710	sq.ft	\$ 90	\$ 60	\$ -	\$ 153,900	\$ 102,600	\$ -	\$ 256,500	Vendor Est per SF

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

\$ 256,500	Subtotal
\$ 25,650	10% Contingency
\$ 56,430	20% Contractor O&P
\$ 33,858	10% Engineering Fees
<b>\$ 372,400</b>	<b>Total</b>

**ECM-2: Window Film**

**Existing: Summer-time solar gain is an issue for the building.**  
**Proposed: Install window film to reduce solar heat gain.**

Linear Feet of window Edge	1,800.0 LF	Cooling System Efficiency	1.2 kW/ton	Heating System Efficiency	0%
Area of window glass	1,710.0 SF	Ex Occupied Clng Temp.	74 °F	Heating On Temp.	55 °F
Existing Infiltration Factor	0.00 cfm/LF	Ex Unoccupied Clng Temp.	85 °F	Ex Occupied Htg Temp.	72 °F
Proposed Infiltration Factor	0.00 cfm/LF	Cooling Occ Enthalpy Setpoi	27.5 Btu/lb	Ex Unoccupied Htg Temp.	72 °F
Existing U Value	0.00 BtuH/SF/°F	Cooling Unocc Enthalpy Setp	27.5 Btu/lb	Electricity	\$ 0.169 \$/kWh
Proposed U Value	0.00 BtuH/SF/°F				

**Average Transmitted Solar Radiation (Btu/ft2/day) for Double Glazing, Uncertainty +/-9% \***

Months	Horizontal Unshaded	North Unshaded	North Shaded	East Unshaded	East Shaded	South Unshaded	South Shaded	West Unshaded	West Shaded	Averages	Total Btu/Windows per Day	BTUH daily average	Cooling Energy per Year (kWh)
January	390	130	120	280	250	730	710	280	250	349	596,600	24858	0
February	590	180	160	320	340	800	730	380	340	427	729,600	30400	0
March	860	240	210	520	450	770	600	520	450	513	877,800	36575	0
April **	1120	310	270	650	550	650	430	630	530	571	976,600	40692	732.5
May	1300	370	320	700	590	550	370	690	580	608	1,039,300	43304	3221.8
June	1400	410	360	740	610	510	370	730	610	638	1,090,600	45442	3271.8
July	1380	400	350	740	620	530	380	730	610	638	1,090,600	45442	3380.9
August	1230	340	300	690	580	620	400	670	560	599	1,024,100	42671	3174.7
September	980	270	240	580	500	740	530	570	490	544	931,000	38792	2793.0
October **	700	200	180	450	400	820	720	440	380	477	815,100	33963	631.7
November	430	140	130	300	260	700	670	280	250	351	600,400	25017	0
December	320	120	100	230	210	650	630	230	200	299	511,100	21296	0
<b>17206.35</b>													

Effectiveness of Window Film: **60%**

Savings	0 Therms	\$ -
	10,324 kWh	\$ 1,745
		\$ 1,745

Window ID	Location	Quantity	Width (ft)	Height (ft)	Linear Feet (LF)	Area (SF)	Infiltration Rate (CFM/LF)	U Value (BtuH/SF/°F)	Infiltration (CFM)	Heat Transfer (BtuH/°F)
1	building	90	3	6	1620.0	1620.0	0.2	0.8	324.0	1296.0
2	building	20	3	1.5	180.0	90.0	0.2	0.8	36.0	72.0
<b>Total</b>		<b>110</b>	<b>6</b>	<b>7.5</b>	<b>1,800.0</b>	<b>1,710.0</b>	<b>0.20</b>	<b>0.80</b>	<b>360.0</b>	<b>1368.0</b>

Notes \* Data provided for Latitude: 40.78°N Longitude: 73.97°W Elevation: 187 feet, New York City, NY  
 \*\* Solar heat gain is conservatively reduced by 75% in these months to offset days that require heating

Borough of Little Ferry  
 CHA Project Number: 28948  
 DPW Headquarters

Multipliers	
Material:	1.03
Labor:	1.35
Equipment:	1.10

**ECM-2 Window Film - Cost**

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Window Film Installation	1,710	sq.ft	\$ 8.00	\$ 1.00	\$ -	\$ 13,680	\$ 1,710	\$ -	\$ 15,390	Vendor Est per SF

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

\$ 15,390	Subtotal
\$ 1,539	10% Contingency
\$ 3,386	20% Contractor O&P
\$ 2,031	10% Engineering Fees
<b>\$ 22,300</b>	<b>Total</b>

**Essex County**  
**CHA Project Number: 29142**  
**DPW Headquarters**

**ECM-3: Install Door Sweeps and Seals**

Description: This ECM evaluates the thermal and electrical savings associate with adding door seals and sweeps to prevent infiltration of cold (hot) outdoor air.

Heating System Efficiency	80%	Ex Occupied Cing Temp.	72 °F	Ex Occupied Htg Temp.	72 °F
Cooling System Efficiency	1.20 kW/ton	Ex Unoccupied Cing Temp.	85 °F	Ex Unoccupied Htg Temp.	60 °F
Linear Feet of Door Edge	80 LF	Cooling Occ Enthalpy Setpoint	27.5 Btu/lb	Electricity	\$ 0.17 \$/kWh
Existing Infiltration Factor*	1.5 cfm/LF	Cooling Unocc Enthalpy Setpoint	27.5 Btu/lb	Natural Gas	\$ 0.83 \$/therm
Proposed Infiltration Factor*	0.45 cfm/LF				

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

Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Door Infiltration Load	Door Infiltration Load	Door Infiltration Load	Door Infiltration Load	Existing Cooling Energy	Proposed Cooling Energy	Existing Heating Energy	Proposed Heating Energy
					BTUH	BTUH	BTUH	BTUH	kWh	kWh	therms	therms
A		B	C	D	E	F	G	H	I	J	K	L
102.5	0.0	0	0	0	14,850	14,850	4,455	4,455	0	0	0	0
97.5	35.4	6	3	4	-4,270	-4,270	-1,281	-1,281	3	1	0	0
92.5	37.4	31	13	18	-5,347	-5,347	-1,604	-1,604	17	5	0	0
87.5	35.0	131	55	76	-4,042	-4,042	-1,213	-1,213	53	16	0	0
82.5	33.0	500	208	292	-2,995	0	-899	0	62	19	0	0
77.5	31.5	620	258	362	-2,186	0	-656	0	56	17	0	0
72.5	29.9	664	277	387	-1,299	0	-390	0	36	11	0	0
67.5	27.2	854	356	498	583	0	175	0	0	0	3	1
62.5	24.0	927	386	541	1,231	0	369	0	0	0	6	2
57.5	20.3	600	250	350	1,879	324	564	97	0	0	7	2
52.5	18.2	730	304	426	2,527	972	758	292	0	0	15	4
47.5	16.0	491	205	286	3,175	1,620	953	486	0	0	14	4
42.5	14.5	656	273	383	3,823	2,268	1,147	680	0	0	24	7
37.5	12.5	1,023	426	597	4,471	2,916	1,341	875	0	0	46	14
32.5	10.5	734	306	428	5,119	3,564	1,536	1,069	0	0	39	12
27.5	8.7	334	139	195	5,767	4,212	1,730	1,264	0	0	20	6
22.5	7.0	252	105	147	6,415	4,860	1,925	1,458	0	0	17	5
17.5	5.4	125	52	73	7,063	5,508	2,119	1,652	0	0	10	3
12.5	3.7	47	20	27	7,711	6,156	2,313	1,847	0	0	4	1
7.5	2.1	34	14	20	8,359	6,804	2,508	2,041	0	0	3	1
2.5	1.3	1	0	1	9,007	7,452	2,702	2,236	0	0	0	0
-2.5	0.0	0	0	0	9,655	8,100	2,897	2,430	0	0	0	0
-7.5	0.0	0	0	0	10,303	8,748	3,091	2,624	0	0	0	0
<b>TOTALS</b>		<b>8,760</b>	<b>3,650</b>	<b>5,110</b>					<b>227</b>	<b>68</b>	<b>207</b>	<b>62</b>

Existing Door Infiltration	120 cfm	Savings	145 therms	\$ 120
Existing Unoccupied Door Infiltration	120 cfm		159 kWh	\$ 27
Proposed Door Infiltration	36 cfm			\$ 147
Proposed Unoccupied Door Infiltration	36 cfm			

Door	Width (ft)	Height (ft)	Linear Feet (LF)	gap (in)	gap location	LF of gap	% door w/ gap	Average gap for door (in)
1a	3	7	20	0.25	all sides	20	100%	0.25
1b	3	7	20	0.25	all sides	20	100%	0.25
2a	3	7	20	0.25	all sides	20	100%	0.25
2b	3	7	20	0.25	all sides	20	100%	0.25
<b>Total</b>	<b>12</b>	<b>28</b>	<b>80</b>	<b>0.250</b>		<b>80</b>	<b>100%</b>	<b>0.250</b>

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

Essex County

CHA Project Number: 29142

DPW Headquarters

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

**ECM-3: Install Door Sweeps and Seals - Cost**

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									\$ -	
Door Weatherization Seals & Sweeps	4	EA	\$ 40	\$ 115	\$ -	\$ 164	\$ 573	\$ -	\$ 737	RS Means 2012
						\$ -	\$ -	\$ -	\$ -	

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

\$ 737	Subtotal
\$ 184	25% Contingency
<b>\$ 922</b>	<b>Total</b>

Essex County  
 CHA Project Number: 29142  
 DPW Headquarters

AIR HANDLER	AREA SERVED	CFM	OA CFM	% OA
(9) RTU(s)	Building	20,000	4,000	20%
			4,000	CFM

**ECM 4: Demand Controlled Ventilation**

ECM Description: This ECM evaluates the energy savings associated with reducing the quantity of outdoor air being introduced to space(s) such as offices, gymnasiums, cafeterias and auditoriums. The reduction in outdoor air ventilation is achieved using carbon dioxide sensors installed within the space(s) that monitor the amount of CO2 being expelled by the occupants. The CO2 level threshold is measured against the CO2 level in the outdoor air and is maintained at 700 parts per million(ppm) in accordance with ASHRAE guidelines.

Electric Cost	\$	0.17	/kWh
Natural Gas Cost	\$	0.83	/therm
Facility Ventilation Heating Load		151,200	BTU/Hour <sup>1,2,3</sup>
Facility Ventilation Cooling Load		43,200	BTU/Hour <sup>1,2,3</sup>
Existing Ventilation Heating Usage		8,367	Therms <sup>2</sup>
Existing Ventilation Cooling Usage		67,242	kWh <sup>3</sup>
Proposed Ventilation Heating Usage		7,949	Therms <sup>7</sup>
Proposed Ventilation Cooling Usage		63,880	kWh <sup>7</sup>
<b>Total heating savings</b>		418	<b>Therms</b>
<b>Total cooling savings</b>		3,362	<b>kWh</b>
<b>Total cost savings</b>		915	
<b>Estimated Total Project Cost</b>		\$16,700	<sup>8</sup>
<b>Simple Payback</b>		18.3	<b>years</b>

Note: costs are used for enrgy savings calculations only. Do not use for procurment

Assumptions

- 1 4,000 OA AHU airflow based exsiting equipment model numbers
- 2 35 °F, Assumed average heating Δt (mixed air and supply)
- 3 10 °F, Assumed average cooling Δt (mixed air and supply)
- 4 80% Heating Efficiency - %
- 5 1.2 Cooling Efficiency - kW/Ton
- 6 4,427 AHU run time per heating/cooling season bin data
- 7 5% Estimated savings for DCV based on NJ Protocols
- 8 \$ 16,700 estimated measure cost for installation of sensors and associated controls

Essex County  
 CHA Project Number: 29142  
 DPW Headquarters

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

**ECM 4: Demand Controlled Ventilation - Cost**

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Re-Program HVAC Controls to allow DCV	1	EA	\$ -	\$ 2,500		\$ -	\$ -	\$ -	\$ -	
CO2 Sensor	9	EA	\$ 500	\$ 500		\$ 4,622	\$ 5,607	\$ -	\$ 10,229	RS Means 2012
						\$ -	\$ -	\$ -	\$ -	

\$ 13,344	Subtotal
\$ 3,336	25% Contingency
<b>\$ 16,700</b>	<b>Total</b>

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



**ECM-5: Replace Condensing Unit**

Description: This ECM evaluates the energy savings associated with replacing older less efficient heating and cooling equipment with modern high efficiency unitary equipment having the same capacity.

Equipment Tag	Equipment Description	General Type	Cooling Capacity (Btu/h)	Heating Capacity (Btu/h)
CU-1	Condensing Unit	HVAC	24,000	

Item	Value	Units	Formula/Comments
Demand Rate	\$ 4.29	/ kW	
Electricity Rate	\$ 0.153	/kWh	
FORMULA CONSTANTS			
Coincidence Factor	0.67		NJ Protocols
Conversion	3.412	btu/kW	
COOLING - HVAC			
Cooling Capacity	24,000	btu/hr	
Baseline EER	8.0		Assumed EER based on unit age
Proposed EER	16.0		Proposed EER of new equipment
Equivalent Full Load Hours	2,891	hrs	NJ Protocols
Demand Savings	1.01	kW	
Energy Savings	4,337	kWh	
SAVINGS			
Demand Savings	1.01	kW	
Energy Savings	4,337	kWh	
Cost Savings	\$ 715		

btuh  
 EERb  
 EERq

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

Essex County  
 CHA Project Number: 29142  
 DPW Headquarters

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Replace

**ECM-5: Replace Condensing Unit - Cost**

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	
Existing 2.0 ton CU demolition & removal	1	EA	\$ 100	\$ 500		\$ 103	\$ 623	\$ -	\$ 726	RS Means 2012
New 2.0 ton CU	1	EA	\$ 2,200	\$ 1,200		\$ 2,259	\$ 1,495	\$ 2,000	\$ 5,755	RS Means 2012
-- Electrical - misc.	1	LS	\$ 250	\$ 250		\$ 257	\$ 312	\$ -	\$ 568	RS Means 2012

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

\$ 7,049	Subtotal
\$ 1,762	25% Contingency
<b>\$ 8,800</b>	<b>Total</b>

Essex County  
 CHA Project Number: 29142  
 DPW Headquarters

**ECM-6: Replace Electric DHW Heater Condensing Gas-Fired DHW Heater**

Description: This ECM evaluates the energy savings associated with replacing an electric tank type water heater with a high efficiency natural gas fired water heater.

Item	Value	Units	Formula/Comments
Occupied days per week	5	days/wk	
Occupied weeks per year	52	week/yr	
Water supply Temperature	55	°F	Temperature of water coming into building
Hot Water Temperature	140	°F	
Hot Water Usage per day	40	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	7,364	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	20	Gallons	Per manufacturer nameplate
Hot Water Temperature	140	°F	Per building personnel
Average Room Temperature	72	°F	
Standby Losses (% by Volume)	2.5%		( 2.5% of stored capacity per hour, per U.S. Department of Energy
Standby Losses (Heat Loss)	0.3	MBH	
Annual Standby Hot Water Load	2,482	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	9,846	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	98%		Per Manufacturer
Total Annual Energy Required	10,047	Mbtu/yr	
<b>Total Annual Electric Required</b>	<b>2,944</b>	<b>kWh/yr</b>	<b>Electrical Savings</b>
Average Annual Electric Demand	0.34	kW	
<b>Peak Electric Demand</b>	<b>5.00</b>	<b>kW</b>	<b>Per Manufacturer's Nameplate (Demand Savings)</b>
New Tank Size	0	Gallons	tankless
Hot Water Temperature	140	°F	
Average Room Temperature	72	°F	
Standby Losses (% by Volume)	2.5%		( 2.5% of stored capacity per hour, per U.S. Department of Energy )
Standby Losses (Heat Loss)	0.0	MBH	
Annual Standby Hot Water Load	0	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	7,364	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Navien CR180 instantaneous, condensing DHW Heater
Proposed Total Annual Energy Required	7,671	MBTU/yr	
Proposed Fuel Use	77	Therms/yr	Standby Losses and inefficient DHW heater eliminattec
Elec Utility Demand Unit Cost	\$4.29	\$/kW	
Elec Utility Supply Unit Cos	\$0.15	\$/kWh	
NG Utility Unit Cost	\$0.83	\$/Therm	
Existing Operating Cost of DHW	\$708	\$/yr	
Proposed Operating Cost of DHW	\$64	\$/yr	
<b>Annual Utility Cost Savings</b>	<b>\$644</b>	<b>\$/yr</b>	

**Daily Hot Water Demand**

FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	#USES PER DAY		FULL TIME OCCUPANTS**		TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
			MALE	FEMALE	MALE	FEMALE			
LAVATORY (Low-Flow Lavs use 0.5 GPM)	2.5	0.25	3	3	1	1	4	50%	2
SHOWER	2.5	5	1	1	1	1	25	75%	19
KITCHEN SINK	2.5	0.5	1	1	1	1	3	75%	2
MOP SINK	2.5	2	1	1	1	1	10	75%	8
Dishwasher (gal per use)	10	1	1	0	1	1	10	100%	10
							<b>41</b>		<b>40</b>

\*GPM is per standard fixtures, adjust as necessary if actual GPM is known.

\*\*These are the occupant that use the fixtures. If fixture does not exist change to (0).

Essex County  
 CHA Project Number: 29142  
 DPW Headquarters

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

**ECM-6: Replace N.G. Water Heaters with Condensing DHW Heaters - Cost**

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
DHW Heater Removal	1	LS		\$ 250		\$ -	\$ 312	\$ -	\$ 312	RS Means 2012
High Efficiency Gas-Fired DHW Heater	1	EA	\$ 4,000	\$ 280		\$ 4,108	\$ 349	\$ -	\$ 4,457	RS Means 2012
Miscellaneous Electrical	1	LS	\$ 300			\$ 308	\$ -	\$ -	\$ 308	RS Means 2012
Venting Kit	1	EA	\$ 450	\$ 650		\$ 462	\$ 810	\$ -	\$ 1,272	RS Means 2012
Miscellaneous Piping and Valves	1	LS	\$ 200			\$ 205	\$ -	\$ -	\$ 205	RS Means 2012

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

\$ 6,554	Subtotal
\$ 1,638	25% Contingency
<b>\$ 8,192</b>	<b>Total</b>

Essex County  
 CHA Project Number: 29142  
 DPW Headquarters

**ECM-7: Replace Toilet Flush Valves with Dual Flush**

Description: This ECM evaluates the water savings associated with replacing/upgrading toilets to 1.28 GPF fixtures and/or flush valves.

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$9.63	\$/ kGal
Toilets in Building	10	
Average Flushes / Toilet (per Day)	10	Based on # of occupants
Average Gallons / Flush	1.6	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	10	
Proposed Gallons / Flush	1.28	Gal

SAVINGS		
Current Toilet Water Use	58.40	kGal / year
Proposed Toilet Water Use	46.72	kGal / year
Water Savings	11.68	kGal / year
Cost Savings	\$112.48	/ year

Essex County  
 CHA Project Number: 29142  
 DPW Headquarters

**ECM-7: Replace Urinals with Waterless Urinals**

Description: This ECM evaluates the water savings associated with replacing/ upgrading urinals with waterless urinals.

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	\$9.63	\$/ kGal
Urinals in Building to be replaced	3	
Average Flushes / Urinal (per Day)	10	Based on # of occupants
Average Gallons / Flush	1.0	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	3	
Proposed Gallons / Flush	0.000	Gal
Proposed Material Cost of new urinal & valve	\$1,200	RS Means 2012
Proposed Installation Cost of new urinal & valve	\$1,000	RS Means 2012
Total cost of new urinals & valves		

SAVINGS		
Current Urinal Water Use	10.95	kGal / year
Proposed Urinal Water Use	0.00	kGal / year
Water Savings	10.95	kGal / year
Cost Savings	\$105.45	/ year

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

Essex County

CHA Project Number: 29142

DPW Headquarters

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

**ECM-7: Replace Plumbing Fixtures - Cost**

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									\$ -	
Waterless Urinal	10	EA	\$ 450	\$ 500	\$ -	\$ 4,622	\$ 6,230	\$ -	\$ 10,852	Vendor Estimate
Install Dual-Flush flushometers	10	EA	\$ 300	\$ 100	\$ -	\$ 3,081	\$ 1,246	\$ -	\$ 4,327	Vendor Estimate
						\$ -	\$ -	\$ -	\$ -	

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

\$ 15,179	Subtotal
\$ 3,795	25% Contingency
<b>\$ 18,973</b>	<b>Total</b>

**Essex County**  
**CHA Project Number: 29142**  
**DPW Headquarters**

**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)	16,125
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)	\$43,314	\$9,913
Existing Usage (from utility)	256,240	11,968
Proposed Savings	54,106	487
Existing Total MMBtus	2,071	
Proposed Savings MMBtus	233	
% Energy Reduction	11.3%	
Proposed Annual Savings	\$9,922	

	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
<b>Total All Incentives</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

<b>Total Project Cost</b>	<b>\$129,407</b>
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		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
<b>Total Eligible Incentives***</b>		<b>\$0</b>
<b>Project Cost w/ Incentives</b>		<b>\$129,407</b>

Project Payback (years)	
w/o Incentives	w/ Incentives
13.0	13.0

\* 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



Field Code	Area Description	EXISTING CONDITIONS									RETROFIT CONDITIONS							COST & SAVINGS ANALYSIS						
		No. of Fixtures before the retrofit	Standard Fixture Code "Lighting Fixture Code" Example = 2'x2' Troff 40 w Recess. Floor 2 40 R F(U) lamps U shape	Code from Table of Standard Fixture Wattages	Watts per Fixture	kW/Space (Watts/Fix) * (Fix No.)	Exist Control	Annual Hours	Annual kWh (kWh/Space) * (Annual Hours)	No. of fixtures after the retrofit	Standard Fixture Code "Lighting Fixture Code" Example = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Watts per Fixture	kW/Space (Watts/Fix) * (Number of Fixtures)	Retrofit Control device	Annual Hours	Annual kWh (kWh/Space) * (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual \$ Saved (kWh Saved) * (\$/kWh)	Retrofit Cost	Cost for renovations to lighting system	NJ Smart Start Prescriptive Lighting Measures	Simple Payback With Incentive Length of time for renovations cost to be recovered
227LED	Exterior lighting	8	70 W MH Wall Pack	MH701	95	0.8	Breaker	4368	3,320	8	FXLED18	18	0.1	Breaker	4,368	629	2,691	0.6	\$ 443.39	\$ 3,385.80	\$800		7.6	5.8
35LED	Office	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	OCC	2400	864	4	T 59 R LED	38	0.2	OCC	2,400	365	499	0.2	\$ 87.09	\$ 945.00	\$0		10.9	10.9
41LED	(2) Offices	7	1B 40 R F 2 (MAG)	F42SS	94	0.7	SW	2400	1,579	7	4 ft LED Tube	30	0.2	SW	2,400	504	1,075	0.4	\$ 187.57	\$ 1,635.90	\$245		8.7	7.4
35LED	Front Corridor	2	T 32 R F 3 (ELE)	F43IL/2	90	0.2	Breaker	2280	410	2	T 59 R LED	38	0.1	Breaker	2,280	173	237	0.1	\$ 41.63	\$ 472.50	\$0		11.3	11.3
35LED	Main Rear Office	27	T 32 R F 3 (ELE)	F43IL/2	90	2.4	OCC	2400	5,832	27	T 59 R LED	38	1.0	OCC	2,400	2,462	3,370	1.4	\$ 587.83	\$ 6,378.75	\$0		10.9	10.9
35LED	Rear Corridor Office	5	T 32 R F 3 (ELE)	F43IL/2	90	0.5	SW	2400	1,080	5	T 59 R LED	38	0.2	SW	2,400	456	624	0.3	\$ 108.86	\$ 1,181.25	\$0		10.9	10.9
35LED	Men's Room	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	OCC	1000	270	3	T 59 R LED	38	0.1	OCC	1,000	114	156	0.2	\$ 31.90	\$ 708.75	\$0		22.2	22.2
35LED	Corridor	1	2T 17 R F 3 (ELE)	F23LL	47	0.0	Breaker	2280	107	1	2T 25 R LED	25	0.0	Breaker	2,280	57	50	0.0	\$ 8.81	\$ 202.50	\$50		23.0	17.3
35LED	Storage Room	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	SW	1000	270	3	T 59 R LED	38	0.1	SW	1,000	114	156	0.2	\$ 31.90	\$ 708.75	\$0		22.2	22.2
232	Basement Stairs	2	R 60 C 1 1	I601	60	0.1	SW	3200	384	2	CF 26	27	0.1	SW	3,200	173	211	0.1	\$ 35.71	\$ 40.50	\$0		1.1	1.1
264LED	Basement Hal	2	Elevator Halogen 20W	HLV201	30	0.2	Breaker	2280	137	2	TCPCW	2	0.0	Breaker	2,280	9	128	0.1	\$ 22.42	\$ 94.50	\$74		4.2	0.9
40LED	Reproduction Room	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1000	240	4	T 38 R LED	38	0.2	SW	1,000	152	88	0.1	\$ 17.99	\$ 945.00	\$200		52.5	41.4
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	Breaker	2280	137	1	T 38 R LED	38	0.0	Breaker	2,280	87	50	0.0	\$ 8.81	\$ 236.25	\$50		26.8	21.1
40LED	Main Room	24	T 32 R F 2 (ELE)	F42LL	60	1.4	SW	1000	1,440	24	T 38 R LED	38	0.9	SW	1,000	912	528	0.5	\$ 107.97	\$ 5,670.00	\$1,200		52.5	41.4
40LED	Main Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	T 38 R LED	38	0.1	SW	1,000	76	44	0.0	\$ 9.00	\$ 472.50	\$100		52.5	41.4
40LED	Basement Storage	25	T 32 R F 2 (ELE)	F42LL	60	1.5	SW	1000	1,500	25	T 38 R LED	38	1.0	SW	1,000	950	550	0.6	\$ 112.46	\$ 5,906.25	\$1,250		52.5	41.4
40LED	Basement Boiler Room	8	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	1820	874	8	T 38 R LED	38	0.3	SW	1,820	553	320	0.2	\$ 58.07	\$ 1,890.00	\$400		32.5	25.7
232	Basement Boiler Room	2	R 60 C 1 1	I601	60	0.1	SW	1820	218	2	CF 26	27	0.1	SW	1,820	98	120	0.1	\$ 21.78	\$ 40.50	\$0		1.9	1.9
40LED	1st Floor Room 32	2	T 32 R F 2 (ELE)	F42LL	60	0.1	OCC	2400	288	2	T 38 R LED	38	0.1	OCC	2,400	182	108	0.0	\$ 18.42	\$ 472.50	\$100		25.6	20.2
35LED	Conference Room	9	T 32 R F 3 (ELE)	F43IL/2	90	0.8	SW	1200	972	9	T 59 R LED	38	0.3	SW	1,200	410	562	0.5	\$ 110.02	\$ 2,126.25	\$0		19.3	19.3
35LED	Through Corridor	11	T 32 R F 3 (ELE)	F43IL/2	90	1.0	Breaker	2280	2,257	11	T 59 R LED	38	0.4	Breaker	2,280	953	1,304	0.6	\$ 228.98	\$ 2,598.75	\$0		11.3	11.3
35LED	Office #23	8	T 32 R F 3 (ELE)	F43IL/2	90	0.7	SW	2400	1,728	8	T 59 R LED	38	0.3	SW	2,400	730	998	0.4	\$ 174.17	\$ 1,890.00	\$0		10.9	10.9
35LED	Office #23	1	2T 17 R F 3 (ELE)	F23LL	47	0.0	SW	2400	113	1	2T 25 R LED	25	0.0	SW	2,400	60	53	0.0	\$ 9.21	\$ 202.50	\$50		22.0	16.6
41LED	Conference Room	3	1B 40 R F 2 (MAG)	F42SS	94	0.3	SW	1200	338	3	4 ft LED Tube	30	0.1	SW	1,200	108	230	0.2	\$ 45.14	\$ 701.10	\$105		15.5	13.2
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	Breaker	2280	137	1	T 38 R LED	38	0.0	Breaker	2,280	87	50	0.0	\$ 8.81	\$ 236.25	\$50		26.8	21.1
41LED	Copy Room	2	1B 40 R F 2 (MAG)	F42SS	94	0.2	SW	2400	451	2	4 ft LED Tube	30	0.1	SW	2,400	144	307	0.1	\$ 53.59	\$ 467.40	\$70		8.7	7.4
41LED	Drawings Storage Room	8	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	1000	752	8	4 ft LED Tube	30	0.2	SW	1,000	240	512	0.5	\$ 104.69	\$ 1,869.60	\$280		17.9	15.2
41LED	Office	9	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	2400	2,030	9	4 ft LED Tube	30	0.3	SW	2,400	648	1,382	0.6	\$ 241.16	\$ 2,103.30	\$315		8.7	7.4
41LED	Main office suite	9	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	2400	2,030	9	4 ft LED Tube	30	0.3	SW	2,400	648	1,382	0.6	\$ 241.16	\$ 2,103.30	\$315		8.7	7.4
41LED	4 small offices	12	1B 40 R F 2 (MAG)	F42SS	94	1.1	SW	2400	2,707	12	4 ft LED Tube	30	0.4	SW	2,400	864	1,843	0.8	\$ 321.55	\$ 2,804.40	\$420		8.7	7.4
35LED	4 small offices	8	T 32 R F 3 (ELE)	F43IL/2	90	0.7	SW	2400	1,728	8	T 59 R LED	38	0.3	SW	2,400	730	998	0.4	\$ 174.17	\$ 1,890.00	\$0		10.9	10.9
35LED	Corridor	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	Breaker	2280	616	3	T 59 R LED	38	0.1	Breaker	2,280	260	356	0.2	\$ 62.45	\$ 708.75	\$0		11.3	11.3
35LED	Ladies Room	1	T 32 R F 3 (ELE)	F43IL/2	90	0.1	OCC	1000	90	1	T 59 R LED	38	0.0	OCC	1,000	38	52	0.1	\$ 10.63	\$ 236.25	\$0		22.2	22.2
35LED	Office of Senior Services	7	T 32 R F 3 (ELE)	F43IL/2	90	0.6	SW	2400	1,512	7	T 59 R LED	38	0.3	SW	2,400	638	874	0.4	\$ 152.40	\$ 1,653.75	\$0		10.9	10.9
35LED	Office	5	T 32 R F 3 (ELE)	F43IL/2	90	0.5	SW	2400	1,080	5	T 59 R LED	38	0.2	SW	2,400	456	624	0.3	\$ 108.86	\$ 1,181.25	\$0		10.9	10.9
35LED	Men's Room	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	OCC	1000	270	3	T 59 R LED	38	0.1	OCC	1,000	114	156	0.2	\$ 31.90	\$ 708.75	\$0		22.2	22.2
35LED	Corridor	7	T 32 R F 3 (ELE)	F43IL/2	90	0.6	Breaker	2280	1,436	7	T 59 R LED	38	0.3	Breaker	2,280	606	830	0.4	\$ 145.72	\$ 1,653.75	\$0		11.3	11.3
35LED	Fiscal Unit	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	38	0.2	SW	2,400	365	499	0.2	\$ 87.09	\$ 945.00	\$0		10.9	10.9
35LED	Office	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	38	0.2	SW	2,400	365	499	0.2	\$ 87.09	\$ 945.00	\$0		10.9	10.9
35LED	Kitchenette area	1	T 32 R F 3 (ELE)	F43IL/2	90	0.1	SW	3102.5	279	1	T 59 R LED	38	0.0	SW	3,103	118	161	0.1	\$ 27.96	\$ 236.25	\$0		8.6	8.6
35LED	Office 21	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	38	0.2	SW	2,400	365	499	0.2	\$ 87.09	\$ 945.00	\$0		10.9	10.9
35LED	Corridor	2	2T 17 R F 3 (ELE)	F23LL	47	0.1	Breaker	2280	214	2	2T 25 R LED	25	0.1	Breaker	2,280	114	100	0.0	\$ 17.61	\$ 405.00	\$100		23.0	17.3
35LED	Copy Room	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	38	0.2	SW	2,400	365	499	0.2	\$ 87.09	\$ 945.00	\$0		10.9	10.9
35LED	Office	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	38	0.2	SW	2,400	365	499	0.2	\$ 87.09	\$ 945.00	\$0		10.9	10.9
35LED	Corridor	11	T 32 R F 3 (ELE)	F43IL/2	90	1.0	Breaker	2280	2,257	11	T 59 R LED	38	0.4	Breaker	2,280	953	1,304	0.6	\$ 228.98	\$ 2,598.75	\$0		11.3	11.3
35LED	Utility Room	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	SW	1000	270	3	T 59 R LED	38	0.1	SW	1,000	114	156	0.2	\$ 31.90	\$ 708.75	\$0		22.2	22.2
35LED	Notary Public	1	T 32 R F 3 (ELE)	F43IL/2	90	0.1	SW	2400	216	1	T 59 R LED	38	0.0	SW	2,400	91	125	0.1	\$ 21.77	\$ 236.25	\$0		10.9	10.9
35LED	Director's Office	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	SW	2400	648	3	T 59 R LED	38	0.1	SW	2,400	274	374	0.2	\$ 65.31	\$ 708.75	\$0		10.9	10.9
264LED	Basement Hal	8	Elevator Halogen 20W	HLV201	30	0.2	SW	2400	576	8	TCPCW	2	0.0	SW	2,400	38	538	0.2	\$ 83.78	\$ 378.00	\$296		4.0	0.9
35LED	Office #1																							

Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS					
		No. of fixtures before the retrofit	Lighting Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist. Control	Annual Hours	Annual kWh	No. of fixtures after the retrofit	Standard Fixture Code* Example 21 40 R F(U) Recess. Floor 2 lamps U shape	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual \$ Saved (kW Saved) * (\$/kWh)	Retrofit Cost Cost for renovations to lighting system	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive
227LED	Exterior lighting	8	70 W MH Wall Pack	MH701	95	0.8	Breaker	4368	3,319.7	8	70 W MH Wall Pack	95	0.8	PHC	3500	2,660.0	659.7	0.0	\$100.93	\$0.00	\$0.00	0.0	0.0
35LED	Office	4	T 32 R F 3 (ELE)	F43LL/2	90	0.4	OCC	2400	864.0	4	T 32 R F 3 (ELE)	90	0.4	none	2400	864.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
41LED	(2) Offices	7	1B 40 R F 2 (MAG)	F42SS	94	0.7	SW	2400	1,579.2	7	1B 40 R F 2 (MAG)	94	0.7	OCC	1800	1,184.4	394.8	0.0	\$60.40	\$128.25	\$20.00	2.1	1.8
35LED	Front corridor	2	T 32 R F 3 (ELE)	F43LL/2	90	0.2	Breaker	2280	410.4	2	T 32 R F 3 (ELE)	90	0.2	none	2280	410.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Main Rear Office	27	T 32 R F 3 (ELE)	F43LL/2	90	2.4	OCC	2400	5,832.0	27	T 32 R F 3 (ELE)	90	2.4	none	2400	5,832.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Rear Corridor Office	5	T 32 R F 3 (ELE)	F43LL/2	90	0.5	SW	2400	1,080.0	5	T 32 R F 3 (ELE)	90	0.5	OCC	1800	810.0	270.0	0.0	\$41.31	\$128.25	\$20.00	3.1	2.6
35LED	Men's Room	3	T 32 R F 3 (ELE)	F43LL/2	90	0.3	OCC	1000	270.0	3	T 32 R F 3 (ELE)	90	0.3	none	1000	270.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Corridor	1	21 17 R F 3 (ELE)	F23LL	47	0.0	Breaker	2280	107.2	1	21 17 R F 3 (ELE)	47	0.0	none	2280	107.2	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Storage Room	3	T 32 R F 3 (ELE)	F43LL/2	90	0.3	SW	1000	270.0	3	T 32 R F 3 (ELE)	90	0.3	none	1000	270.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
232	Basement Stairs	2	R 60 C 1 1	I601	60	0.1	SW	3200	384.0	2	R 60 C 1 1	60	0.1	none	3200	384.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
264LED	Basement Hal	2	Elevator Halogen 20W	HLV201	30	0.1	Breaker	2280	136.8	2	Elevator Halogen 20W	30	0.1	none	2280	136.8	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
40LED	Reproduction Room	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1000	240.0	4	T 32 R F 2 (ELE)	60	0.2	OCC	750	180.0	60.0	0.0	\$9.18	\$128.25	\$20.00	14.0	11.8
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	Breaker	2280	136.8	1	T 32 R F 2 (ELE)	60	0.1	none	2280	136.8	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
40LED	Main Room	24	T 32 R F 2 (ELE)	F42LL	60	1.4	SW	1000	1,440.0	24	T 32 R F 2 (ELE)	60	1.4	OCC	750	1,080.0	360.0	0.0	\$55.08	\$128.25	\$20.00	2.3	2.0
40LED	Main Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	1000	120.0	2	T 32 R F 2 (ELE)	60	0.1	OCC	750	90.0	30.0	0.0	\$4.59	\$128.25	\$20.00	27.9	23.6
40LED	Basement Storage	25	T 32 R F 2 (ELE)	F42LL	60	1.5	SW	1000	1,500.0	25	T 32 R F 2 (ELE)	60	1.5	OCC	750	1,125.0	375.0	0.0	\$57.38	\$128.25	\$20.00	2.2	1.9
40LED	Basement Boiler Room	8	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	1820	873.6	8	T 32 R F 2 (ELE)	60	0.5	none	1820	873.6	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
232	Basement Boiler Room	2	R 60 C 1 1	I601	60	0.1	SW	1820	218.4	2	R 60 C 1 1	60	0.1	none	1820	218.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
40LED	1st Floor Room 32	2	T 32 R F 2 (ELE)	F42LL	60	0.1	OCC	2400	288.0	2	T 32 R F 2 (ELE)	60	0.1	none	2400	288.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Conference Room	9	T 32 R F 3 (ELE)	F43LL/2	90	0.8	SW	1200	972.0	9	T 32 R F 3 (ELE)	90	0.8	OCC	1000	810.0	162.0	0.0	\$24.79	\$128.25	\$20.00	5.2	4.4
35LED	Through Corridor	11	T 32 R F 3 (ELE)	F43LL/2	90	1.0	Breaker	2280	2,257.2	11	T 32 R F 3 (ELE)	90	1.0	none	2280	2,257.2	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Office #23	8	T 32 R F 3 (ELE)	F43LL/2	90	0.7	SW	2400	1,728.0	8	T 32 R F 3 (ELE)	90	0.7	OCC	1800	1,296.0	432.0	0.0	\$66.10	\$128.25	\$20.00	1.9	1.6
35LED	Office #23	1	21 17 R F 3 (ELE)	F23LL	47	0.0	SW	2400	112.8	1	21 17 R F 3 (ELE)	47	0.0	OCC	1800	84.6	28.2	0.0	\$4.31	\$128.25	\$20.00	29.7	25.1
41LED	Conference Room	3	1B 40 R F 2 (MAG)	F42SS	94	0.3	SW	1200	338.4	3	1B 40 R F 2 (MAG)	94	0.3	OCC	1000	282.0	56.4	0.0	\$8.63	\$128.25	\$20.00	14.9	12.5
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	Breaker	2280	136.8	1	T 32 R F 2 (ELE)	60	0.1	none	2280	136.8	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
41LED	Copy Room	2	1B 40 R F 2 (MAG)	F42SS	94	0.2	SW	2400	451.2	2	1B 40 R F 2 (MAG)	94	0.2	OCC	1800	338.4	112.8	0.0	\$17.26	\$128.25	\$20.00	7.4	6.3
41LED	Drawings Storage Room	8	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	1000	752.0	8	1B 40 R F 2 (MAG)	94	0.8	OCC	750	564.0	188.0	0.0	\$28.76	\$128.25	\$20.00	4.5	3.8
41LED	Office	9	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	2400	2,030.4	9	1B 40 R F 2 (MAG)	94	0.8	OCC	1800	1,522.8	507.6	0.0	\$77.66	\$128.25	\$20.00	1.7	1.4
41LED	Main office suite	9	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	2400	2,030.4	9	1B 40 R F 2 (MAG)	94	0.8	OCC	1800	1,522.8	507.6	0.0	\$77.66	\$128.25	\$20.00	1.7	1.4
41LED	4 small offices	12	1B 40 R F 2 (MAG)	F42SS	94	1.1	SW	2400	2,707.2	12	1B 40 R F 2 (MAG)	94	1.1	OCC	1800	2,030.4	676.8	0.0	\$103.55	\$128.25	\$20.00	1.2	1.0
35LED	4 small offices	8	T 32 R F 3 (ELE)	F43LL/2	90	0.7	SW	2400	1,728.0	8	T 32 R F 3 (ELE)	90	0.7	OCC	1800	1,296.0	432.0	0.0	\$66.10	\$128.25	\$20.00	1.9	1.6
35LED	Corridor	3	T 32 R F 3 (ELE)	F43LL/2	90	0.3	Breaker	2280	615.6	3	T 32 R F 3 (ELE)	90	0.3	none	2280	615.6	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Ladies Room	1	T 32 R F 3 (ELE)	F43LL/2	90	0.1	OCC	1000	90.0	1	T 32 R F 3 (ELE)	90	0.1	none	1000	90.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Office of Senior Services	7	T 32 R F 3 (ELE)	F43LL/2	90	0.6	SW	2400	1,512.0	7	T 32 R F 3 (ELE)	90	0.6	OCC	1800	1,134.0	378.0	0.0	\$57.83	\$128.25	\$20.00	2.2	1.9
35LED	Office	5	T 32 R F 3 (ELE)	F43LL/2	90	0.5	SW	2400	1,080.0	5	T 32 R F 3 (ELE)	90	0.5	OCC	1800	810.0	270.0	0.0	\$41.31	\$128.25	\$20.00	3.1	2.6
35LED	Men's Room	3	T 32 R F 3 (ELE)	F43LL/2	90	0.3	OCC	1000	270.0	3	T 32 R F 3 (ELE)	90	0.3	none	1000	270.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Corridor	7	T 32 R F 3 (ELE)	F43LL/2	90	0.6	Breaker	2280	1,436.4	7	T 32 R F 3 (ELE)	90	0.6	none	2280	1,436.4	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Fiscal Unit	4	T 32 R F 3 (ELE)	F43LL/2	90	0.4	SW	2400	864.0	4	T 32 R F 3 (ELE)	90	0.4	OCC	1800	648.0	216.0	0.0	\$33.05	\$128.25	\$20.00	3.9	3.3
35LED	Office	4	T 32 R F 3 (ELE)	F43LL/2	90	0.4	SW	2400	864.0	4	T 32 R F 3 (ELE)	90	0.4	OCC	1800	648.0	216.0	0.0	\$33.05	\$128.25	\$20.00	3.9	3.3
35LED	Kitchenette area	1	T 32 R F 3 (ELE)	F43LL/2	90	0.1	SW	3102.5	279.2	1	T 32 R F 3 (ELE)	90	0.1	OCC	1500	135.0	144.2	0.0	\$22.07	\$128.25	\$20.00	5.8	4.9
35LED	Office 21	4	T 32 R F 3 (ELE)	F43LL/2	90	0.4	SW	2400	864.0	4	T 32 R F 3 (ELE)	90	0.4	OCC	1800	648.0	216.0	0.0	\$33.05	\$128.25	\$20.00	3.9	3.3
35LED	Corridor	2	21 17 R F 3 (ELE)	F23LL	47	0.1	Breaker	2280	214.3	2	21 17 R F 3 (ELE)	47	0.1	none	2280	214.3	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Copy Room	4	T 32 R F 3 (ELE)	F43LL/2	90	0.4	SW	2400	864.0	4	T 32 R F 3 (ELE)	90	0.4	OCC	1800	648.0	216.0	0.0	\$33.05	\$128.25	\$20.00	3.9	3.3
35LED	Office	4	T 32 R F 3 (ELE)	F43LL/2	90	0.4	SW	2400	864.0	4	T 32 R F 3 (ELE)	90	0.4	OCC	1800	648.0	216.0	0.0	\$33.05	\$128.25	\$20.00	3.9	3.3
35LED	Corridor	11	T 32 R F 3 (ELE)	F43LL/2	90	1.0	Breaker	2280	2,257.2	11	T 32 R F 3 (ELE)	90	1.0	none	2280	2,257.2	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Utility Room	3	T 32 R F 3 (ELE)	F43LL/2	90	0.3	SW	1000	270.0	3	T 32 R F 3 (ELE)	90	0.3	none	1000	270.0	0.0	0.0	\$0.00	\$0.00	\$0.00		#DIV/0!
35LED	Notary Public	1	T 32 R F 3 (ELE)	F43LL/2	90	0.1	SW	2400	216.0	1	T 32 R F 3 (ELE)	90	0.1	OCC	1800	162.0	54.0	0.0	\$8.26	\$128.25	\$20.00	15.5	13.1
35LED	Director's Office	3	T 32 R F 3 (ELE)	F43LL/2	90	0.3	SW	2400	648.0	3	T 32 R F 3 (ELE)	90	0.3	OCC	1800	486.0	162.0	0.0	\$24.79	\$128.25	\$20.00	5.2	4.4
264LED	Office #11	8	Elevator Halogen 20W	HLV201	30	0.2	SW	2400	576.0	8	Elevator Halogen 20W	30	0.2	OCC	1800	432.0	144.0	0.0	\$22.03	\$128.25	\$20.00	5.8	4.9
35LED	Office #12	3	T 32 R F 3 (ELE)	F43LL/2	90	0.3	SW	2400	648.0	3	T 32 R F 3 (ELE)	90	0.3	OCC	1800	486.0	162.0						

Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS							
		No. of Fixtures before the retrofit	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	No. of Fixtures after the retrofit	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual \$ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback	
			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)		Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit Control device	Estimated annual hours for the usage group	(kW/Space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * (\$/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered	
227LED	Exterior lighting	8	70 W MH Wall Pack	MH70/1	95	0.8	Breaker	4368	3,320	8	FXLED18	FXLED18/1	18	0.1	PHC	3,500	504	2,816	0.6	\$ 462.51	\$ 3,385.80	\$ 800	7.3	5.6	
35LED	Office	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	OCC	2400	864	4	T 59 R LED	RTLED38	38	0.2	none	2,400	365	499	0.2	\$ 87.09	\$ 945.00	-	10.9	10.9	
41LED	(2) Offices	7	1B 40 R F 2 (MAG)	F42SS	94	0.7	SW	2400	1,579	7	4 ft LED Tube	200732x2	30	0.2	OCC	1,800	378	1,201	0.4	\$ 206.85	\$ 1,784.15	\$ 265	8.5	7.2	
35LED	Front corridor	2	T 32 R F 3 (ELE)	F43IL/2	90	0.2	Breaker	2280	410	2	T 59 R LED	RTLED38	38	0.1	none	2,280	173	237	0.1	\$ 41.63	\$ 472.50	-	11.3	11.3	
35LED	Main Rear Office	27	T 32 R F 3 (ELE)	F43IL/2	90	2.4	OCC	2400	5,832	27	T 59 R LED	RTLED38	38	1.0	none	2,400	2,462	3,370	1.4	\$ 587.83	\$ 6,378.75	-	10.9	10.9	
35LED	Rear Corridor Office	5	T 32 R F 3 (ELE)	F43IL/2	90	0.5	SW	2400	1,080	5	T 59 R LED	RTLED38	38	0.2	OCC	1,800	342	738	0.3	\$ 126.30	\$ 1,309.50	\$ 20	10.4	10.2	
35LED	Men's Room	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	OCC	1000	270	3	T 59 R LED	RTLED38	38	0.1	none	1,000	114	156	0.2	\$ 31.90	\$ 708.75	-	22.2	22.2	
35LED	Corridor	1	2T 17 R F 3 (ELE)	F23LL	47	0.0	Breaker	2280	107	1	2T 17 R LED	2RTLED	25	0.0	none	2,280	57	50	0.0	\$ 8.81	\$ 202.50	\$ 50	23.0	17.3	
35LED	Storage Room	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	SW	1000	270	3	T 59 R LED	RTLED38	38	0.1	none	1,000	114	156	0.2	\$ 31.90	\$ 708.75	-	22.2	22.2	
232	Basement Stairs	2	R 60 C 1	160/1	60	0.1	SW	3200	384	2	CF 26	CF026/1-L	27	0.1	none	3,200	173	211	0.1	\$ 35.71	\$ 40.50	-	1.1	1.1	
264LED	Basement Hal	2	Elevator Halogen 20W	HLV20/1	30	0.1	Breaker	2280	137	2	TCPC2W	H20LED	2	0.0	none	2,280	9	128	0.1	\$ 22.42	\$ 94.50	\$ 74	4.2	0.9	
40LED	Reproduction Room	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1000	240	4	T 38 R LED	RTLED38	38	0.2	OCC	750	114	126	0.1	\$ 23.81	\$ 1,073.25	\$ 220	45.1	35.8	
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	Breaker	2280	137	1	T 38 R LED	RTLED38	38	0.0	none	2,280	87	8.81	0.0	\$ 8.81	\$ 236.25	\$ 50	26.8	21.1	
40LED	Main Room	24	T 32 R F 2 (ELE)	F42LL	60	1.4	SW	1000	1,440	24	T 38 R LED	RTLED38	38	0.9	OCC	750	684	796	0.5	\$ 142.85	\$ 5,798.25	\$ 1,220	40.6	32.0	
40LED	Main Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	1000	120	2	T 38 R LED	RTLED38	38	0.1	OCC	750	57	63	0.0	\$ 11.90	\$ 600.75	\$ 120	50.5	40.4	
40LED	Basement Storage	25	T 32 R F 2 (ELE)	F42LL	60	1.5	SW	1000	1,500	25	T 38 R LED	RTLED38	38	1.0	OCC	750	713	788	0.6	\$ 148.80	\$ 6,034.50	\$ 1,270	40.6	32.0	
40LED	Basement Boiler Room	8	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	1820	874	8	T 38 R LED	RTLED38	38	0.3	none	1,820	553	320	0.2	\$ 58.07	\$ 1,890.00	\$ 400	32.5	25.7	
232	Basement Boiler Room	2	R 60 C 1	160/1	60	0.1	SW	1820	218	2	CF 26	CF026/1-L	27	0.1	none	1,820	98	120	0.1	\$ 21.78	\$ 40.50	-	1.9	1.9	
40LED	1st Floor Room 32	2	T 32 R F 2 (ELE)	F42LL	60	0.1	OCC	2400	288	2	T 38 R LED	RTLED38	38	0.1	none	2,400	182	108	0.0	\$ 18.42	\$ 472.50	\$ 100	25.6	20.2	
35LED	Conference Room	9	T 32 R F 3 (ELE)	F43IL/2	90	0.8	SW	1200	972	9	T 59 R LED	RTLED38	38	0.3	OCC	1,000	342	630	0.5	\$ 120.48	\$ 2,254.50	\$ 20	18.7	18.5	
35LED	Through Corridor	11	T 32 R F 3 (ELE)	F43IL/2	90	1.0	Breaker	2280	2,257	11	T 59 R LED	RTLED38	38	0.4	none	2,280	953	1,304	0.6	\$ 228.98	\$ 2,598.75	-	11.3	11.3	
35LED	Office #23	8	T 32 R F 3 (ELE)	F43IL/2	90	0.7	SW	2400	1,728	8	T 59 R LED	RTLED38	38	0.3	OCC	1,800	547	1,181	0.4	\$ 202.08	\$ 2,018.25	\$ 20	10.0	9.9	
35LED	Office #23	1	2T 17 R F 3 (ELE)	F23LL	47	0.0	SW	2400	113	1	2T 17 R LED	2RTLED	25	0.0	OCC	1,800	45	68	0.0	\$ 11.51	\$ 330.75	\$ 70	28.7	22.7	
41LED	Conference Room	3	1B 40 R F 2 (MAG)	F42SS	94	0.3	SW	1200	338	3	4 ft LED Tube	200732x2	30	0.1	OCC	1,000	90	248	0.2	\$ 47.89	\$ 829.35	\$ 125	17.3	14.7	
40LED	Hallway	1	T 32 R F 2 (ELE)	F42LL	60	0.1	Breaker	2280	137	1	T 38 R LED	RTLED38	38	0.0	none	2,280	87	50	0.0	\$ 8.81	\$ 236.25	\$ 50	26.8	21.1	
41LED	Copy Room	2	1B 40 R F 2 (MAG)	F42SS	94	0.2	SW	2400	451	2	4 ft LED Tube	200732x2	30	0.1	OCC	1,800	108	343	0.1	\$ 59.10	\$ 595.65	\$ 90	10.1	8.6	
41LED	Drawings Storage Room	8	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	1000	752	8	4 ft LED Tube	200732x2	30	0.2	OCC	750	180	572	0.5	\$ 113.87	\$ 1,997.85	\$ 300	17.5	14.9	
41LED	Office	9	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	2400	2,030	9	4 ft LED Tube	200732x2	30	0.3	OCC	1,800	486	1,544	0.6	\$ 265.95	\$ 2,231.55	\$ 335	8.4	7.1	
41LED	Main office suite	9	1B 40 R F 2 (MAG)	F42SS	94	0.8	SW	2400	2,030	9	4 ft LED Tube	200732x2	30	0.3	OCC	1,800	486	1,544	0.6	\$ 265.95	\$ 2,231.55	\$ 335	8.4	7.1	
41LED	4 small offices	12	1B 40 R F 2 (MAG)	F42SS	94	1.1	SW	2400	2,707	12	4 ft LED Tube	200732x2	30	0.4	OCC	1,800	648	2,059	0.8	\$ 354.59	\$ 2,932.65	\$ 440	8.3	7.0	
35LED	4 small offices	8	T 32 R F 3 (ELE)	F43IL/2	90	0.7	SW	2400	1,728	8	T 59 R LED	RTLED38	38	0.3	OCC	1,800	547	1,181	0.4	\$ 202.08	\$ 2,018.25	\$ 20	10.0	9.9	
35LED	Corridor	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	Breaker	2280	616	3	T 59 R LED	RTLED38	38	0.1	none	2,280	260	356	0.1	\$ 62.45	\$ 708.75	-	11.3	11.3	
35LED	Ladies Room	1	T 32 R F 3 (ELE)	F43IL/2	90	0.1	OCC	1000	90	1	T 59 R LED	RTLED38	38	0.0	none	1,000	38	52	0.1	\$ 10.63	\$ 236.25	-	22.2	22.2	
35LED	Office of Senior Services	7	T 32 R F 3 (ELE)	F43IL/2	90	0.6	SW	2400	1,512	7	T 59 R LED	RTLED38	38	0.3	OCC	1,800	479	1,033	0.4	\$ 176.82	\$ 1,792.00	\$ 20	10.1	10.0	
35LED	Office	5	T 32 R F 3 (ELE)	F43IL/2	90	0.5	SW	2400	1,080	5	T 59 R LED	RTLED38	38	0.2	OCC	1,800	342	738	0.3	\$ 126.30	\$ 1,309.50	\$ 20	10.4	10.2	
35LED	Men's Room	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	OCC	1000	270	3	T 59 R LED	RTLED38	38	0.1	none	1,000	114	156	0.2	\$ 31.90	\$ 708.75	-	22.2	22.2	
35LED	Corridor	7	T 32 R F 3 (ELE)	F43IL/2	90	0.6	Breaker	2280	1,436	7	T 59 R LED	RTLED38	38	0.3	none	2,280	606	830	0.4	\$ 145.72	\$ 1,653.75	-	11.3	11.3	
35LED	Fiscal Unit	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	RTLED38	38	0.2	OCC	1,800	274	590	0.2	\$ 101.04	\$ 1,073.25	\$ 20	10.6	10.4	
35LED	Office	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	RTLED38	38	0.2	OCC	1,800	274	590	0.2	\$ 101.04	\$ 1,073.25	\$ 20	10.6	10.4	
35LED	Kitchenette area	1	T 32 R F 3 (ELE)	F43IL/2	90	0.1	SW	3102.5	279	1	T 59 R LED	RTLED38	38	0.0	OCC	1,500	57	222	0.1	\$ 36.68	\$ 364.50	\$ 20	9.9	9.4	
35LED	Office 21	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	RTLED38	38	0.2	OCC	1,800	274	590	0.2	\$ 101.04	\$ 1,073.25	\$ 20	10.6	10.4	
35LED	Corridor	2	2T 17 R F 3 (ELE)	F23LL	47	0.1	Breaker	2280	214	2	2T 17 R LED	2RTLED	25	0.1	none	2,280	114	100	0.0	\$ 17.61	\$ 405.00	\$ 100	23.0	17.3	
35LED	Copy Room	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	RTLED38	38	0.2	OCC	1,800	274	590	0.2	\$ 101.04	\$ 1,073.25	\$ 20	10.6	10.4	
35LED	Office	4	T 32 R F 3 (ELE)	F43IL/2	90	0.4	SW	2400	864	4	T 59 R LED	RTLED38	38	0.2	OCC	1,800	274	590	0.2	\$ 101.04	\$ 1,073.25	\$ 20	10.6	10.4	
35LED	Corridor	11	T 32 R F 3 (ELE)	F43IL/2	90	1.0	Breaker	2280	2,257	11	T 59 R LED	RTLED38	38	0.4	none	2,280	953	1,304	0.6	\$ 228.98	\$ 2,598.75	-	11.3	11.3	
35LED	Utility Room	3	T 32 R F 3 (ELE)	F43IL/2	90	0.3	SW	1000	270	3	T 59 R LED	RTLED38	38	0.1	none	1,000	114	156	0.2	\$ 31.90	\$ 708.75	-	22.2	22.2	
35LED	Notary Public	1	T 32 R F 3 (ELE)	F43IL/2	90	0.1	SW	2400	216	1	T 59 R LED	RTLED38	38	0.0	OCC	1,800	68	148	0.1	\$ 25.26	\$ 364.50	\$ 20	14.4	13.6	
35LED	Director's Office	3	T 32 R F 3 (ELE)	F43IL/2	90																				

## **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



# Your Power to Save

At Home, for Business, and for the Future

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HOME	RESIDENTIAL	COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT
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Home » Commercial & Industrial » Programs

## NJ SmartStart Buildings

### Program Overview

#### COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

#### PROGRAMS

NJ SMARTSTART BUILDINGS

EQUIPMENT INCENTIVES

FOOD SERVICE EQUIPMENT

APPLICATION FORMS

TOOLS AND RESOURCES

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

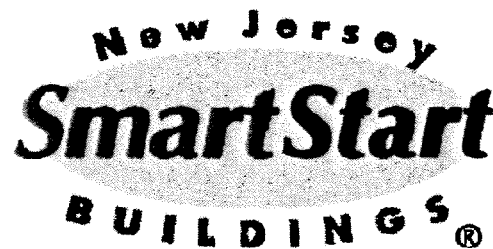
DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM



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

... A smart start now means better performance later! Whether you're starting a commercial industrial project from the ground up, renovating existing space, or upgrading equipment, you have 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.** You must submit an application form (and applicable worksheets) and receive an approval 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 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, the manufacturer's specification sheet (refer to the specific program requirements on the ballot application for specs needed for your project) for the equipment you are planning to install. (Program representatives will review your application package and approve it, reject it, or advise you of upgrades in equipment that will save energy costs and/or increase your in-

**Support for Custom Energy-Efficiency Measures**

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

**Incentives for Qualifying Equipment and Projects**

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

Find out more about equipment incentives

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

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**COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT**

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**PROGRAMS**

NJ SMARTSTART BUILDINGS

EQUIPMENT INCENTIVES

FOOD SERVICE EQUIPMENT

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COMBINED HEAT & POWER AND FUEL CELLS

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LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

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ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

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## Equipment Incentives

### Special Notice

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

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

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

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

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

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



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

#### Electric Chillers

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

#### Gas Cooling

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



## PAST PROGRAMS

## TOOLS AND RESOURCES

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**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 disor  
 effective March 1, 2013 except for buildings impacted by Hurri  
 Sandy. Approved applications will have the standard timefram  
 year from the program commitment date to complete the instal**)

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

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

**Prescriptive Lighting**

New Linear Fluorescent

T-12, HID and Incandescent to T-5 and T-8 (\$25 - \$200 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 Spaces  
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 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

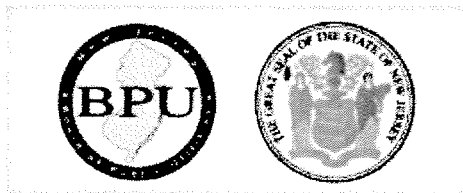


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## Direct Install

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NEW JERSEY'S CLEAN ENERGY PROGRAM

## DIRECT Install

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

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

### ELIGIBILITY



Existing small to mid-sized commercial and industrial facilities with a peak electric demand that did not exceed 200 kW 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 140,000 Btuh.

### III. PAY FOR PERFORMANCE (P4P)



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## COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

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

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

### ENERGY STAR Portfolio Manager

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



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

### Incentives

**OIL, PROPANE & MUNICIPAL  
ELECTRIC CUSTOMERS**

Pay for Performance incentives are awarded upon the satisfactory completion of three 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 \$50,000 based on approximately \$.10 per square foot, not to exceed 50% of the 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-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.

**PROGRAM UPDATES**

**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:**

<input type="checkbox"/> Atlantic City Electric	<input type="checkbox"/> Jersey Central Power & Light	<input type="checkbox"/> PSE&G
<input type="checkbox"/> New Jersey Natural Gas	<input type="checkbox"/> Elizabethtown Gas	<input type="checkbox"/> Rockland Electric Co.
<input type="checkbox"/> Other Electric Service Provider (please specify): _____		
<input type="checkbox"/> Other Fuel Provider: _____	<input type="checkbox"/> Oil: _____	<input type="checkbox"/> 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: _____



# 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 Entity Cap of \$4M (Definition of an Entity can be found in the Board Order Docket No. EO07030203).

**INSTALLATION AGREEMENT** – The Participating Customer must submit an executed Installation Agreement as part of the Request for Incentive #1 Form. By executing the Installation Agreement, the Customer agrees to install all of the measures in the Energy Reduction Plan, which are estimated to result in meeting or exceeding the minimum 15% performance target. The Customer agrees to the performance-based incentives (Incentives #2 & #3) as indicated in the document which are based on the results of the Energy Reduction Plan. Implementation of the measures must commence in the time period twelve months following the approval date of the Energy Reduction Plan. 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 performancebased 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 preinspected. 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)

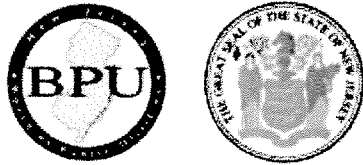


# Your Power to Save

At Home, for Business, and for the Future

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Home » Commercial & Industrial » Programs

## Energy Savings Improvement Program

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

### 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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[PAST PROGRAMS](#)

[TOOLS AND RESOURCES](#)

[PROGRAM UPDATES](#)

[CONTACT US](#)

This Local Finance Notice outlines how local governments can develop and implement energy related improvements to 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**

**Essex County Department of Parks  
DPW Headquarters**

Cost of Electricity	\$0.169	/kWh
Electricity Usage	256,240	kWh/yr
System Unit Cost	\$4,000	/kW

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

Budgetary Cost	Annual Utility Savings				Estimated Maintenance	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
	\$	kW	kWh	therms	\$	\$	\$	\$	Years	Years
\$240,000	60.0	79,455	0	\$13,428	0	\$13,428	\$0	\$13,507	17.9	8.9

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

**Area Output\***

1,477 m<sup>2</sup>  
15,903 ft<sup>2</sup>

**Perimeter Output\***

177 m  
581 ft

**Available Roof Space for PV:**

(Area Output - 10 ft x Perimeter) x 85%  
8,576 ft<sup>2</sup>

**Approximate System Size:**

Is the roof flat? (Yes/No) **Yes**

8 watt/ft<sup>2</sup>  
68,609 DC watts  
60 kW

Enter into PV Watts

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

Enter into PV Watts (always 20 if flat, if

Array Tilt Angle	20	pitched - enter estimated roof angle)
Array Azimuth	180	Enter into PV Watts (default)
Zip Code	07044	Enter into PV Watts
DC/AC Derate Factor	0.83	Enter into PV Watts



**PV Watts Output**

79,455 annual kWh calculated in PV Watts program

**% Offset Calc**

Usage	256,240 (from utilities)
PV Generation	79,455 (generated using PV Watts)
% offset	31%

\* <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)



**AC Energy  
&  
Cost Savings**

\*\*\*\*\*



(Type comments here to appear on printout; maximum 1 row of 90 characters.)

[Saving Text from a Browser](#)

Station Identification		Results			
Cell ID:	0268370	Month	Solar Radiation (kWh/m <sup>2</sup> /day)	AC Energy (kWh)	Energy Value (\$)
State:	New Jersey	1	3.18	5100	861.90
Latitude:	40.9 ° N	2	3.90	5610	948.09
Longitude:	74.2 ° W	3	5.05	7688	1299.27
<b>PV System Specifications</b>		4	5.16	7329	1238.60
DC Rating:	60.0 kW	5	5.47	7873	1330.54
DC to AC Derate Factor:	0.830	6	5.70	7722	1305.02
AC Rating:	49.8 kW	7	5.36	7345	1241.31
Array Type:	Fixed Tilt	8	5.32	7348	1241.81
Array Tilt:	40.9 °	9	5.16	7084	1197.20
Array Azimuth:	180.0 °	10	4.60	6779	1145.65
<b>Energy Specifications</b>		11	3.32	4857	820.83
Cost of Electricity:	16.9 ¢/kWh	12	3.00	4720	797.68
		Year	4.60	79455	13427.90
<input type="button" value="Output Hourly Performance Data"/>		<input type="button" value="Output Results as Text"/>			
<i>(Gridded data is monthly, hourly output not available.)</i>		<i>(Output Results as Text - Temporarily Unavailable)</i>			
<input type="button" value="Run PVWATTS v.2 for another location"/>		<input type="button" value="Run PVWATTS v.1"/>			

Please send questions and comments to [Webmaster](#)

[Disclaimer and copyright notice.](#)



RReDC home page (<http://rredc.nrel.gov>)

## **APPENDIX F**

### **Photos**





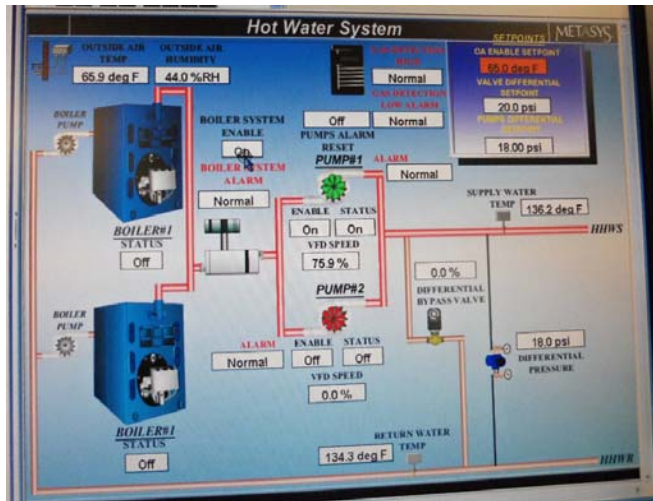
1: DPW Headquarters from Bloomfield Avenue



2: Hot Water Boiler Plant



3: Napps Chiller



4: Johnson Metasys Controls screen



5: Split system condensing unit on roof

## **APPENDIX G**

### **EPA Benchmarking Report**



LEARN MORE AT  
energystar.gov

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

# 16

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

## DPW Headquarters Building

**Primary Property Function:** Office  
**Gross Floor Area (ft<sup>2</sup>):** 16,125  
**Built:** 1952

**For Year Ending:** December 31, 2013  
**Date Generated:** October 29, 2014

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

### Property & Contact Information

**Property Address**  
DPW Headquarters Building  
900 Bloomfield Avenue  
Verona, New Jersey 07044

**Property Owner**  
\_\_\_\_\_  
,  
(\_\_\_\_)\_\_\_\_-\_\_\_\_

**Primary Contact**  
\_\_\_\_\_  
,  
(\_\_\_\_)\_\_\_\_-\_\_\_\_  
\_\_\_\_\_

**Property ID:** 4198656

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

Site EUI	Annual Energy by Fuel	National Median Comparison	
128.4 kBtu/ft <sup>2</sup>	Electric - Grid (kBtu) 874,291 (42%)	National Median Site EUI (kBtu/ft <sup>2</sup> )	85.6
	Natural Gas (kBtu) 1,196,797 (58%)	National Median Source EUI (kBtu/ft <sup>2</sup> )	165.5
		% Diff from National Median Source EUI	50%
<b>Source EUI</b>		<b>Annual Emissions</b>	
248.2 kBtu/ft <sup>2</sup>		Greenhouse Gas Emissions (Metric Tons CO <sub>2</sub> e/year)	181

### 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)