

CITY OF LINDEN

MUNICIPAL GARAGE

1901 Lower Road Linden NJ, 07036

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

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CHA PROJECT NO. 29743

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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 Linden City 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
Municipal Garage	1901 Lower Road, Linden, NJ, 07036	14,000	1935

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)
Municipal Garage	39,017	11,707	\$19,233	7.5

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

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

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

Summary of Energy Conservation Measures

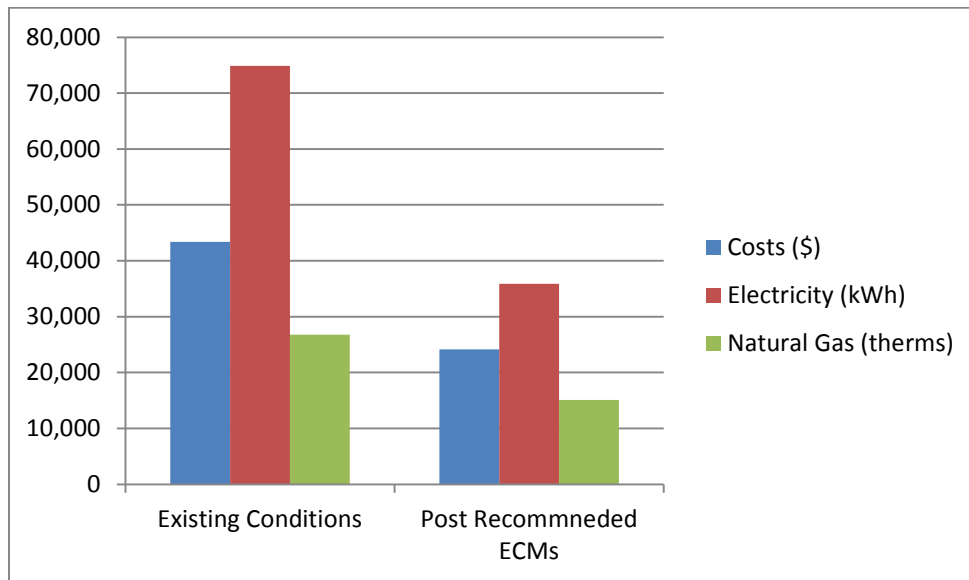
ECM #	Energy Conservation Measure	Est. Costs (\$)	Est. Savings (\$/year)	Potential Incentive (\$)*	Payback w/o Incentive	Payback w/ Incentive	Recommended
ECM-1	Install gas infrared heaters	119,153	15,232	7.8	3,900	7.6	Y
ECM-2	Add window A/C unit controllers	400	198	2.0	0	2.0	Y
ECM-3	Replace gas water heater with high efficiency condensing water heater	4,446	105	42.4	150	41.0	N
ECM-4	Replace Garage Doors	33,463	1,136	29.5	0	29.5	N
ECM-5	Install wall insulation	13,900	2,261	6.1	0	6.1	Y
ECM-6	Install Programmable Thermostats for radiant heaters	5,363	730	7.4	975	6.0	Y
ECM-7	Window replacement	93,100	863	107.9	0	107.9	N
ECM-L1	Lighting Replacements / Upgrades	4,725	693	6.8	0	6.8	N
ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	770	289	2.7	120	2.3	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	5,495	813	6.8	120	6.6	Y
Total**		275,319	21,337	5,145	12.9	12.7	
Total(Recommended)		144,310	19,233	4,995	7.5	7.2	

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

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

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs (\$)	43,369	24,135	44%
Electricity (kWh)	74,876	35,859	52%
Natural Gas (therms)	26,788	15,081	44%
Site EUI (kbtu/SF/Yr)	209.6	116.5	



2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

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

Building Name: Municipal Garage
Address: 1901 Lower Road Linden, NJ 07036
Gross Floor Area: 14,000 sq. ft.
Number of Floors: Single story
Year Built: 1935



Building Envelope

Description of Spaces: The building houses garage facilities, offices, storage room, restrooms and a mechanical room.

Description of Occupancy: The facility has 18 permanent employees working during regular office hours.

Number of Computers: The building has approximately 5 desktop and laptop computers.

Building Usage: Normal operating hours for the garage are from 7.00 AM to 5.00 PM. However, some of the employees work overtime hours to service vehicles during weather related events.

Construction Materials: Brick, concrete block, and structural steel. The exterior walls are uninsulated. An ECM is included that evaluates the potential savings for adding wall insulation.

Roof: The building has a curved roof covered with a black rubber membrane. It is believed that the roof is well insulated and appears to be in good condition. Therefore no ECMs associated with the roof are evaluated

Windows: The building has two layers of single pane windows. Windows are in fair condition. An ECM related window replacement has been evaluated. .

Exterior Doors: Exterior man doors are steel doors and in good condition. In addition, the garage has roll up overhead doors on one side of the building to facilitate movement of trucks in and out of the garage. The rollup doors are in poor condition. An ECM is included that evaluates changing the uninsulated overhead doors to insulated doors.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: The building is heated by a boiler and hot water heating system. Heating hot water is generated by a 90 HP H B Smith cast iron gas fired boiler located in the mechanical equipment room. Terminal units include ten (10) hot water vertical unit heaters and two (2) hot water horizontal unit heaters installed in the garage space and one (1) hot water horizontal unit heater is installed in the restrooms. The perimeter office space is provided with finned tube radiators. Heating hot water to this equipment is supplied by two hot water circulating pumps. The hot water boiler and the two hot circulating pumps are approximately 10 years old and in good condition, however, all of the unit heaters and the finned tube radiators are over 20 years old and are not performing satisfactorily, resulting in higher energy consumption. An ECM related to installing gas radiant heaters for the garage area has been evaluated.

Cooling: Cooling is provided only for the offices by two through the wall window air conditioners and a one small DX split A/C system. This equipment is in good condition. To improve energy savings, an ECM has been included that evaluates the energy savings for adding window A/C unit controllers.

Ventilation: The garage has several rollup doors and the frequent opening and closing of these doors allows outside air to infiltrate into the building. In our opinion, the volume of outside air infiltrating into the building is adequate for the occupants of the garage. There is no ECM associated with the ventilation system.

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

The vehicle bays have been provided with vehicle exhaust system. The vehicle exhaust systems are in good condition and therefore no ECM associated with the vehicle exhaust system have been evaluated.

Controls Systems

The building does not have a central control system. The boiler operation and heating hot water supply temperature is controlled by outside air temperature control. The unit heaters do not have any control and are started and stopped manually. Window air conditioners and the DX split AC system are controlled by their individual thermostats. Set points vary and are manually set by users in the spaces. The heating set points were observed to be about 72 F. Cooling set points were reported to be 72 F.

ECMs related to installing window AC unit controllers and programmable thermostats for the radiant heaters have been evaluated.

Domestic Hot Water Systems

Domestic hot water is provided by an A O Smith gas fired water heater installed in the mechanical equipment room of the building. The water heater is in good condition, however to increase energy savings, an ECM related to replacing the water heater with a high efficiency condensing gas water heater has been evaluated.

Kitchen Equipment

There is no kitchen in this building.

Plug Load

This building has garage equipment and a few computers and printers which contribute to the plug load in the building. The plug load devices appear to be in good condition and therefore, there is no ECM associated with plug load devices.

Plumbing Systems

The urinals and toilets appear to be high flow plumbing fixtures (3.5 GPF +). The sink faucets do not appear to have low-flow type aerators. Installing low-flow plumbing fixtures is included in the O&M section.

Lighting Systems

The garage area/storage area has 8 foot T-12 fluorescent lighting and the office area has 4 foot T-12 fluorescent lighting. All the lights in this building are controlled by manual switches. LED lights are recommended in this study. We have provided three alternatives for the observed lighting that include adding occupancy sensors to the existing lights, replacing the lights with LED lights and a third ECM that evaluates adding occupancy sensors to the proposed LED lights.

3.0 UTILITIES

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

	Electric	Natural Gas
Deliverer	PSE&G	Elizabethtown
Supplier	HESS	Elizabethtown

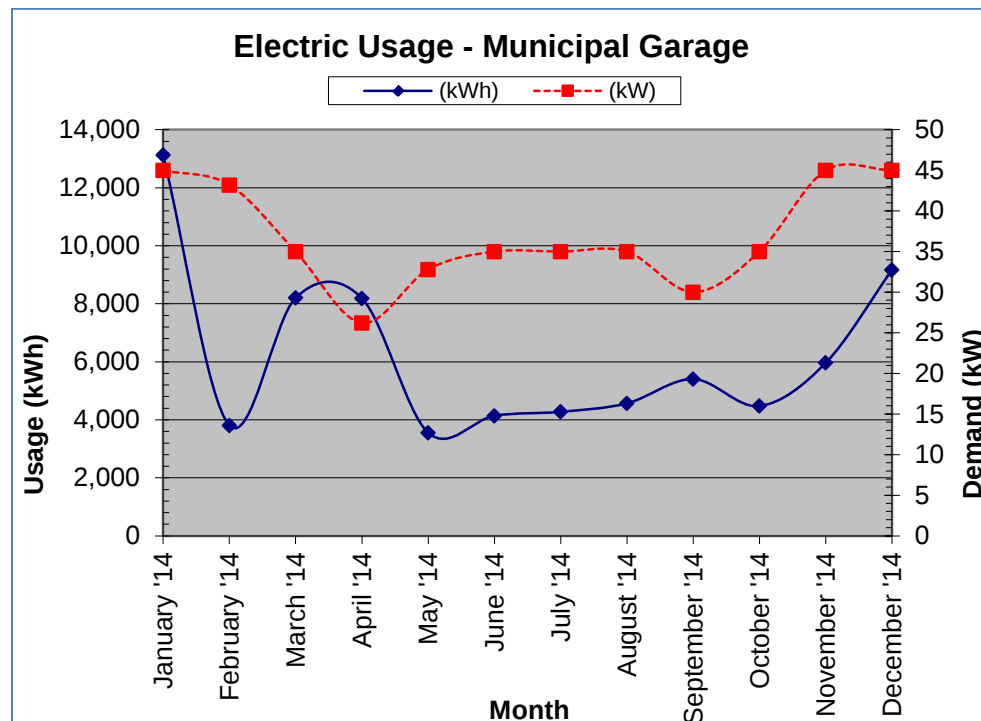
For the 12-month period ending in December 2014, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	74,876	kWh
Annual Cost	10,307	\$
Blended Unit Rate	0.138	\$/kWh
Supply Rate	0.112	\$/kWh
Demand Rate	4.29	\$/kW
Peak Demand	45.0	kW
Natural Gas		
Annual Consumption	26,788	Therms
Annual Cost	31.798	\$
Unit Rate	1.19	\$/therm

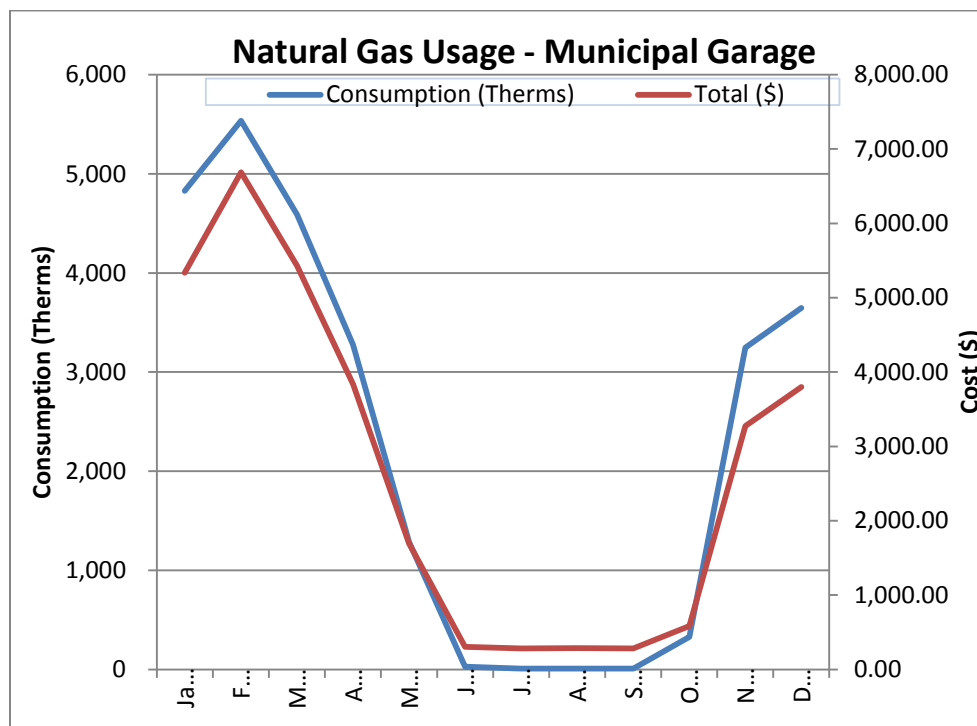
Blended Rate: Average rate charged determined by the annual cost / annual usage

Supply Rate: Estimated

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



The electric usage fluctuates with the building usage. The usage does not show typical increase of usage in summer because almost all of the building is heated.



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

See Appendix A for utility analysis.

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

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	Average Rate	NJ Average Rate	
Electricity	\$/kWh	\$0.138	\$0.13	Y
Natural Gas	\$/Therm	\$1.19	\$0.96	Y

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

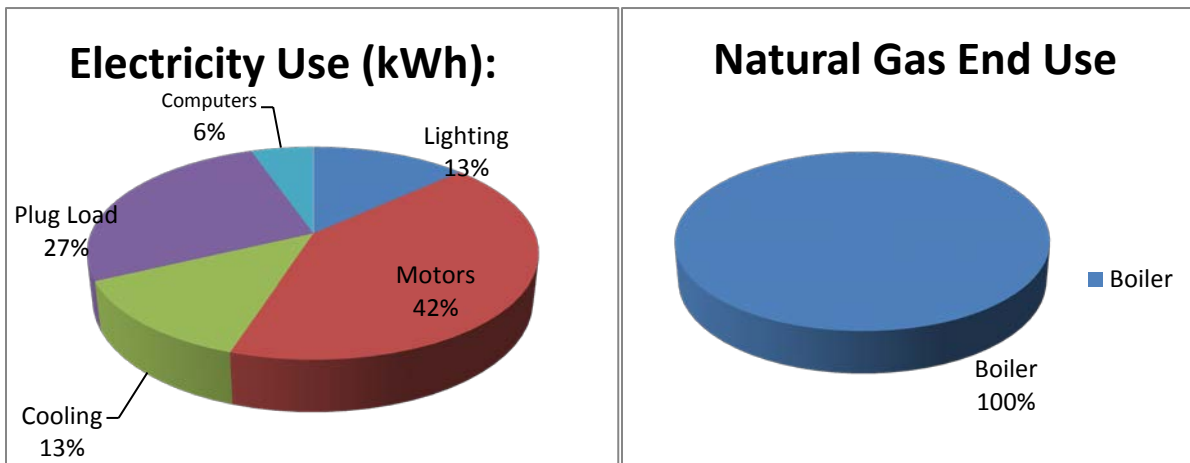
Additional information on selecting a third party energy supplier is available here:

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

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

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

Site End-Use Utility Profile



4.0 BENCHMARKING

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

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

Site EUI kBtu/ft ² /yr	Source EUI (kBtu/ft ² /yr)	Energy Star Rating (1-100)
209.6	258.2	N/A

The building has higher EUIs than the national median EUIs (national median site EUI is 81.5 kBtu/ft² and national median source EUI is 100.4 kBtu/ft²). The EUI of this building is 257% higher than national median. It is believed that the lack of building insulation, old and poorly functioning hot water unit heaters are contributing to this high EUI. The EUI could be reduced after implementing some of the proposed energy conservation measures.

The EPA Portfolio Manager can be accessed with the following:

[REDACTED]

[REDACTED]

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 Install Gas Infrared Heaters

The existing heating system consists of a hot water boiler supplying several ceiling mounted unit heaters. While the boiler and associated heating hot water pumps are approximately 10 years old and in good condition, the hot water unit heaters are over 20 years old and in bad condition resulting in very poor performance of the heating system and high energy consumption. This ECM evaluates the energy savings associated with adding gas fired radiant heaters to the garage bays and abandoning the hot water heating system.

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

ECM-1 Install Gas Infrared Heaters

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
119,153	0	31,250	9,208	15,232	0.7	3,900	7.8	7.6

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

This measure is recommended.

5.2 ECM-2 Add Window AC Unit Controllers

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

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

ECM-2 Add Window AC Unit Controllers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
400	0	1,435	0	198	8.9	0	2.0	2.0

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

This measure is recommended. .

5.3 ECM-3 Replace Gas Water Heater with High Efficiency Condensing Water Heater

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

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

ECM-3 Replace Gas Water Heater with High Efficiency Condensing Water Heater

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
4,446	0	0	88	105	(0.5)	150	42.4	41.0

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

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

5.4 ECM-4 Replace Garage Doors

The building has uninsulated garage doors with glass panels. This ECM evaluates replacing the overhead garage doors with insulated garage doors having less glass area. Note: no cooling savings are calculated as the garage area is not air conditioned.

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

ECM-4 Replace Garage Doors

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
33,463	0	0	957	1,136	(0.5)	0	29.5	29.5

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

This measure is not recommended.

5.5 ECM-5 Install Wall Insulation

Currently the exterior walls are block with no insulation. This measure evaluates adding 1" thick polyisocyanurate foam board insulation with R value 6.5 on the interior of the exterior walls.

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

ECM-5 Install Wall Insulation

Budgetary Cost	Annual Utility Savings	ROI	Potential Incentive*	Payback (without)	Payback (with)
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	Electricity		Natural Gas	Total			incentive)	incentive)
\$	kW	kWh	Therms	\$		\$	Years	Years
13,900	0	175	1,884	2,261	2.3	0	6.1	6.1

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

This measure is recommended.

5.6 ECM-6 Install Programmable Thermostats for Radiant Heaters

This measure assesses the energy savings associated with replacing the a standard non programmable thermostat with a programmable thermostat allowing for unoccupied temperature set- back

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

ECM-6 Install Programmable Thermostats for Radiant Heaters

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
\$	kW	kWh	Therms	\$		\$	Years	Years
5,363	0	0	615	730	1.0	975	7.4	6.0

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

This measure is recommended.

5.7 ECM-7 Replace Windows

The building has old single pane windows which lead to large amount of the heating/cooling loss. Replacing these old windows with high heat resistance double pane windows will help reduce the energy loss and save energy.

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

ECM-7 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
93,100	0	0	727	863	(0.8)	0	107.9	107.9

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

This measure is not recommended.

5.8.1 ECM-L1 Lighting Replacement / Upgrades

The garage area/storage area has 8 foot T-12 fluorescent lighting and the office area has 4 foot T-12 fluorescent lighting. All the lights in this building are controlled by manual switches. Recent technological improvements in light emitting diode (LED) technologies have driven down the initial costs making it a viable option for installation.

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

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

ECM-L1 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings			ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas				
\$	kW	kWh	Therms	\$	\$	Years	Years
4,725	2	5,075	0	693	1.6	0	6.8

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

This measure is not recommended in lieu of ECM L3.

5.8.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

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

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

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

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings			ROI	Potential Incentive*	Payback (without)	Payback (with)
	Electricity		Natural Gas				

	Electricity		Natural Gas	Total			incentive)	incentive)
\$	kW	kWh	Therms	\$		\$	Years	Years
770	0	2,096	0	289	4.6	120	2.7	2.3

* 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
5,495	2	6,156	0	813	1.7	120	6.8	6.6

* 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:

- Upgrade the plumbing fixtures to low flow plumbing fixtures when needed

6.0 PROJECT INCENTIVES

6.1 Incentives Overview

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

6.1.1 New Jersey Smart Start Program

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

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

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

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

6.1.2 Direct Install Program

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

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

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

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

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

During the site walkthrough, it was observed that the building has a curved roof. It is our understanding that this type of roof may not be suitable to support the additional load of solar panels. Hence, the photovoltaic rooftop solar power generation screening evaluation was not performed.

7.1.2 Solar Thermal Hot Water Generation

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

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

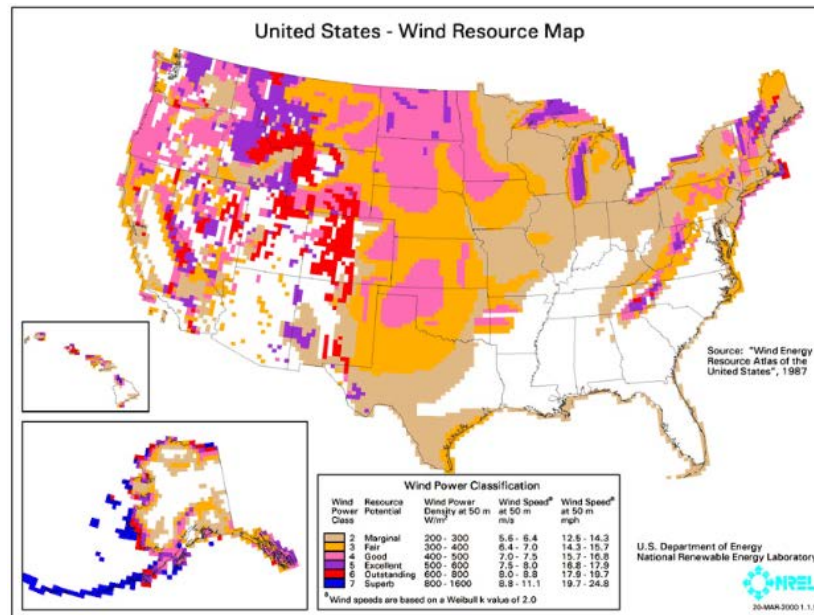
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping).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

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

7.2 Wind Powered Turbines

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

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



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

7.3 Combined Heat and Power Plant

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

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. The building has sufficient need for electrical generation and the ability to use most of the thermal byproduct during the winter; however thermal usage during the summer months does not exist. Thermal energy produced by the CHP plant in the warmer months will be wasted. An absorption chiller could be installed to utilize the heat to produce chilled water; however, there is no chilled water distribution system in the building. CHP is not recommended due to the building's limited summer thermal demand.

This measure is not recommended due to the absence of year-round thermal loads which are needed for efficiency CHP operation. However, a mini-size CHP could be an option for West Deptford Township to consider. The sizing and energy savings of the mini-size CHP require further study.

7.4 Demand Response Curtailment

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

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

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From January 2014 through December 2014 the following table summarizes the electricity load profile for the building.

Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
45.0	26.2	35.2	N	N

*the demand is estimated from one month bill

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

8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for the Fire House#1 at Linden City.

The following projects should be considered for implementation:

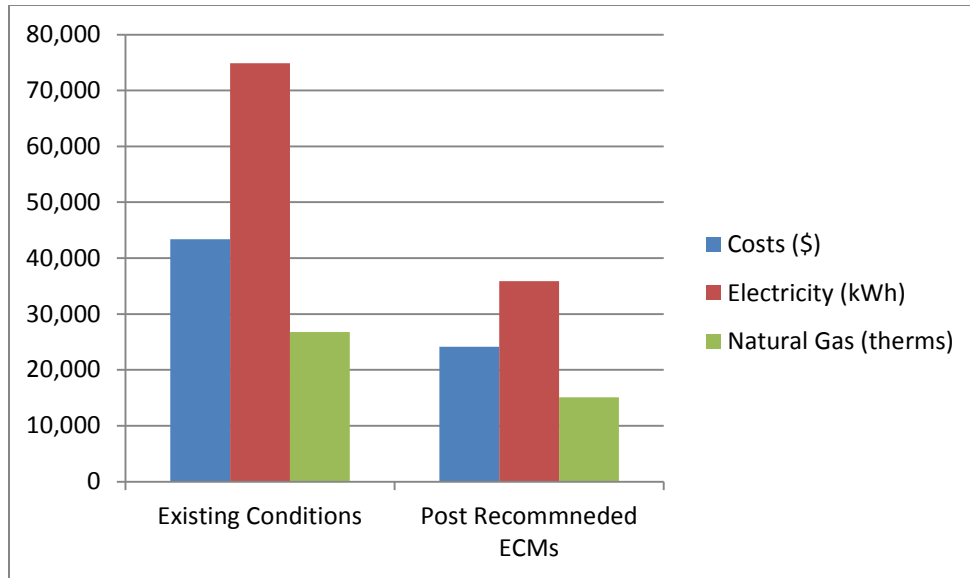
- Install gas infrared heaters
- Add window AC unit controllers
- Install wall insulation
- Install programmable thermostat for gas radiant heaters
- Lighting Replacements with Controls (Occupancy Sensors)

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

Electric Savings (kWh)	Natural Gas Savings (therms)	Total Savings (\$)	Payback (years)
39,017	11,707	\$19,233	7.5

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs (\$)	43,369	24,135	44%
Electricity (kWh)	74,876	35,859	52%
Natural Gas (therms)	26,788	15,081	44%
Site EUI (kbtu/SF/Yr)	209.6	116.5	



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

APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

Municipal Garage
1901 Lower Road, Linden, NJ 07036

Municipal Garage

Annual Utilities
12-month Summary

Electric		
Annual Usage	74,876	kWh/yr
Annual Cost	10,307	\$
Blended Rate	0.138	\$/kWh
Consumption Rate	0.112	\$/kWh
Demand Rate	4.29	\$/kW
Peak Demand	45.0	kW
Min. Demand	26.2	kW
Avg. Demand	35.2	kW
Natural Gas		
Annual Usage	26,788	Therms/yr
Annual Cost	31,798	\$
Rate	1.187	\$/Therm

Municipal Garage
1901 Lower Road, Linden, NJ 07036

Utility Bills: Account Numbers

<u>Account Number</u>	<u>Building</u>	<u>Location</u>	<u>Type</u>	<u>Notes</u>
6979172301	Municipal Garage	1901 Lower Road, Linden, NJ 07036	Electricity	
1235983651	Municipal Garage	1901 Lower Road, Linden, NJ 07036	Natural Gas	

Municipal Garage
1901 Lower Road, Linden, NJ 07036

For Service at: Municipal Garage
Account No.: 6979172301
Meter No.: 9199795
Electric Service

Delivery - PSE&G
Supplier - HESS

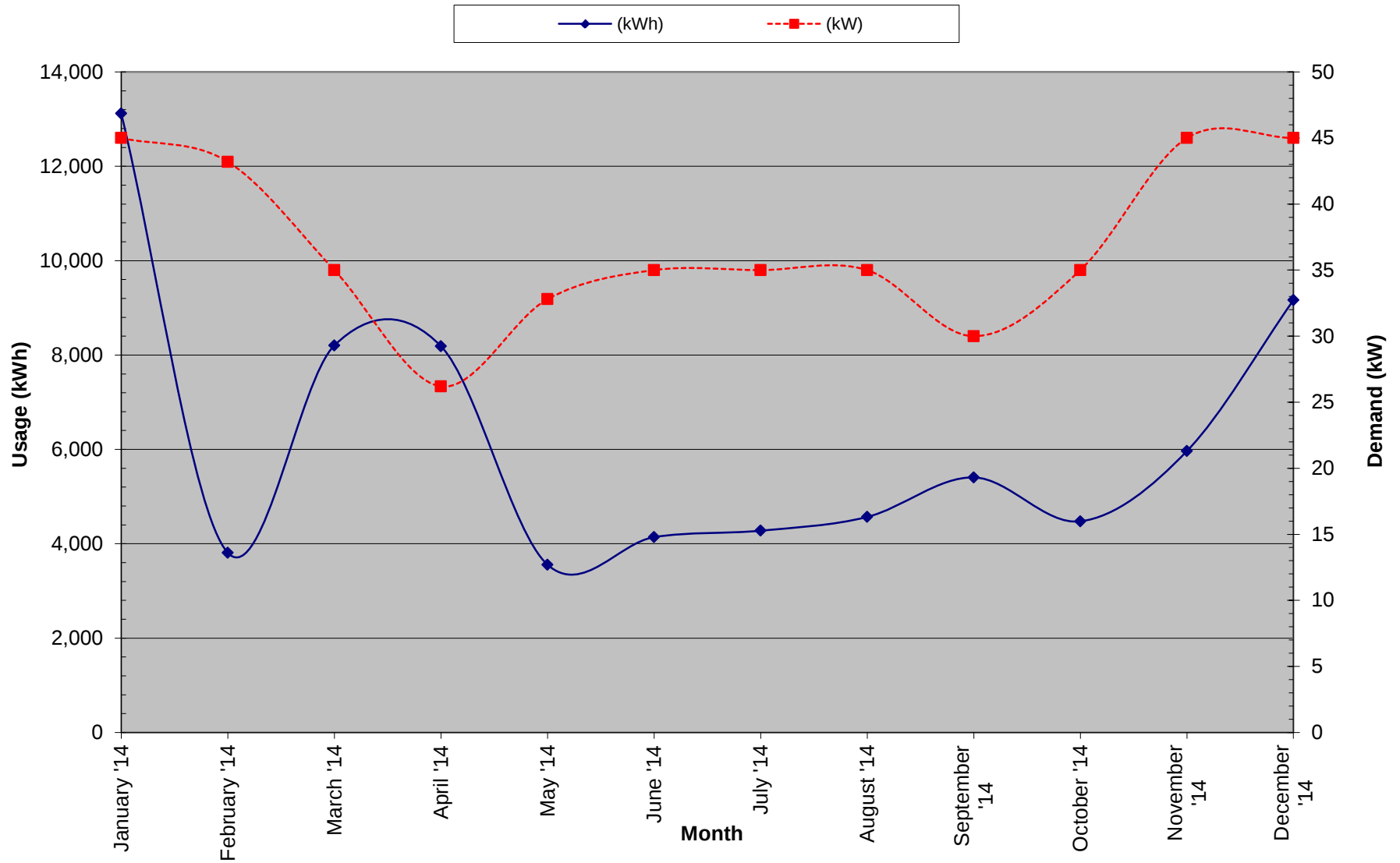
			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	Consumption (kWh)	Demand (kW)	Delivery (\$)	Supplier (\$)	Total (\$)	Consumption (\$)	Demand (\$)	Blended Rate (\$/kWh)	Consumption Rate (\$/kWh)	Demand (\$/kW)
January '14	13,123	45.0	\$ 633.05	\$ 1,030.15	\$1,663.20	\$ 1,470.60	\$ 192.60	\$ 0.13	\$ 0.11	\$ 4.28
February '14	3,810	43.2	\$ 315.73	\$ 299.08	\$614.81	\$ 429.89	\$ 184.92	\$ 0.16	\$ 0.11	\$ 4.28
March '14	8,203	35.0	\$ 425.67	\$ 643.93	\$1,069.60	\$ 919.80	\$ 149.80	\$ 0.13	\$ 0.11	\$ 4.28
April '14	8,188	26.2	\$ 391.20	\$ 642.75	\$1,033.95	\$ 917.01	\$ 116.94	\$ 0.13	\$ 0.11	\$ 4.46
May '14	3,557	32.8	\$ 262.38	\$ 279.22	\$541.60	\$ 401.20	\$ 140.40	\$ 0.15	\$ 0.11	\$ 4.28
June '14	4,140	35.0	\$ 291.62	\$ 324.99	\$616.61	\$ 466.81	\$ 149.80	\$ 0.15	\$ 0.11	\$ 4.28
July '14	4,277	35.0	\$ 296.14	\$ 335.74	\$631.88	\$ 482.08	\$ 149.80	\$ 0.15	\$ 0.11	\$ 4.28
August '14	4,568	35.0	\$ 305.74	\$ 358.58	\$664.32	\$ 514.52	\$ 149.80	\$ 0.15	\$ 0.11	\$ 4.28
September '14	5,406	30.0	\$ 311.40	\$ 424.37	\$735.77	\$ 607.35	\$ 128.42	\$ 0.14	\$ 0.11	\$ 4.28
October '14	4,475	35.0	\$ 302.67	\$ 351.28	\$653.95	\$ 459.65	\$ 149.80	\$ 0.15	\$ 0.10	\$ 4.28
November '14	5,964	45.0	\$ 393.81	\$ 468.17	\$861.98	\$ 669.38	\$ 192.60	\$ 0.14	\$ 0.11	\$ 4.28
December '14	9,165	45.0	\$ 499.44	\$ 719.45	\$1,218.89	\$ 1,026.29	\$ 192.60	\$ 0.13	\$ 0.11	\$ 4.28
Total (last 12-months)	74,876	45.00	\$4,428.85	\$5,877.71	\$10,306.56	\$8,364.58	\$1,897.48	\$ 0.138	\$ 0.112	\$ 4.291
Notes	1	2	3	4	5	6	7	8	9	10

1.) In use KWH taken from PSE&G bills.

2) Supplier rate taken 0.0785/KWH.

Supply Rate Fixed/Averaged:
\$0.0852

Electric Usage - Municipal Garage

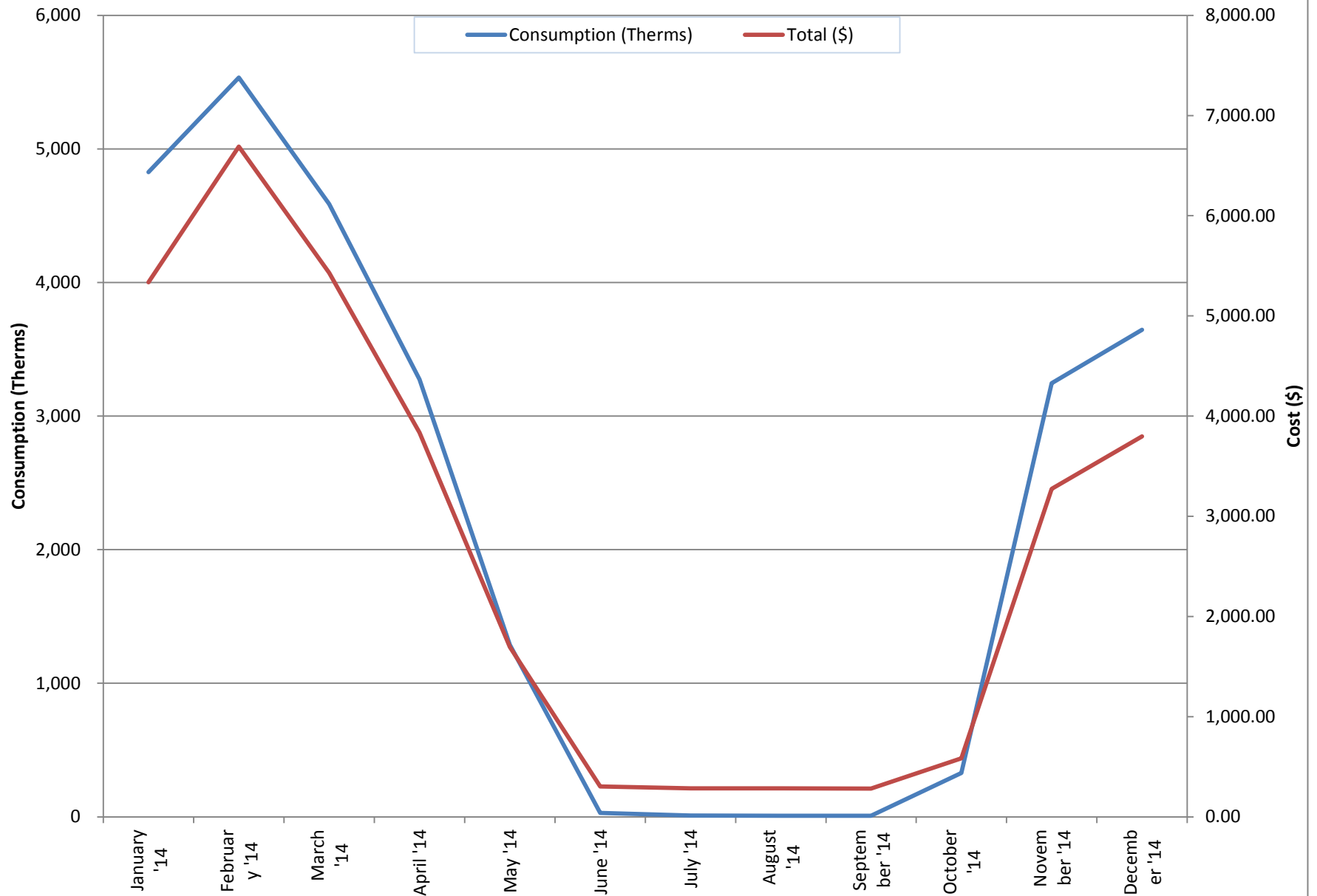


Municipal Garage
1901 Lower Road, Linden, NJ 07036

For Service at: Municipal Garage
Account No.: 1235983651
Meter No.: 9434072
Natural Gas Service
Delivery - Elizabethtown
Supplier - Elizabethtown

Month	Consumption (Therms)	Charges			Unit Costs		
		Delivery (\$)	Supply (\$)	Total (\$)	Delivery (\$/Therm)	Supply (\$/Therm)	Total (\$/Therm)
January '14	4,827	\$ 5,336		\$ 5,336	\$ 1.11	\$ -	\$ 1.11
February '14	5,534	\$ 6,689		\$ 6,689	\$ 1.21	\$ -	\$ 1.21
March '14	4,588	\$ 5,429		\$ 5,429	\$ 1.18	\$ -	\$ 1.18
April '14	3,275	\$ 3,836		\$ 3,836	\$ 1.17	\$ -	\$ 1.17
May '14	1,288	\$ 1,696		\$ 1,696	\$ 1.32	\$ -	\$ 1.32
June '14	29	\$ 304		\$ 304	\$ 10.49	\$ -	\$ 10.49
July '14	10	\$ 285		\$ 285	\$ 28.46	\$ -	\$ 28.46
August '14	8	\$ 285		\$ 285	\$ 35.63	\$ -	\$ 35.63
September '14	8	\$ 282		\$ 282	\$ 35.24	\$ -	\$ 35.24
October '14	328	\$ 585		\$ 585	\$ 1.78	\$ -	\$ 1.78
November '14	3,247	\$ 3,273		\$ 3,273	\$ 1.01	\$ -	\$ 1.01
December '14	3,646	\$ 3,797		\$ 3,797	\$ 1.04	\$ -	\$ 1.04
Total (12 - Month)	26,788			\$ 31,798.31			\$ 1.187

Natural Gas Usage - Municipal Garage



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

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

Supplier	Telephone & Web Site	*Customer Class
AEP Energy, Inc. 309 Fellowship Road, Fl. 2 Mount Laurel, NJ 08054	(866) 258-3782 www.aepenergy.com	C/I ACTIVE
Alpha Gas and Electric, LLC 641 5 th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	R/C ACTIVE
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877)-30-AMBIT (877) 302-6248 www.ambitenergy.com	R/C ACTIVE
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com	C ACTIVE
Amerigreen Energy, Inc. 1463 Lamberton Road Trenton, NJ 08611	888-423-8357 www.amerigreen.com	R/C ACTIVE
AP Gas & Electric, LLC 10 North Park Place, Suite 420 Morristown, NJ 07960	(855) 544-4895 www.apge.com	R/C/I ACTIVE
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(201) 384-5552 www.astralenergylc.com	R/C/I ACTIVE
Barclays Capital Services, Inc. 70 Hudson Street Jersey City, NJ 07302-4585	(888) 978-9974 www.group.barclays.com	C ACTIVE
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	(888) 651-4121 www.greateasternenergy.com	C/I ACTIVE
Champion Energy Services, LLC 72 Avenue L Newark, NJ 07105	(877) 653-5090 www.championenergyservices.com	R/C/I ACTIVE

Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	888-565-4490 www.4choiceenergy.com	R/C ACTIVE
Clearview Electric, Inc. 505 Park Drive Woodbury, NJ 08096	(888) CLR-VIEW (800) 746-4702 www.clearviewenergy.com	R/C/I ACTIVE
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07446	1-866-587-8674 www.commerceenergy.com	R ACTIVE
ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	C/I ACTIVE
Constellation NewEnergy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(866) 237-7693 www.constellation.com	R/C/I ACTIVE
Constellation Energy 900A Lake Street, Suite 2 Ramsey, NJ 07446	(877) 997-9995 www.constellation.com	R ACTIVE
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	(212) 538-3124 www.creditsuisse.com	C ACTIVE
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergybusiness.com	C/I ACTIVE
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(866) 348-4193 www.directenergy.com	R ACTIVE
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, New Jersey 08002	(800) 282-3331 www.discountenergygroup.com	R/C ACTIVE
Dominion Retail, Inc. d/b/a Dominion Energy Solutions 395 Route #70 West Suite 125 Lakewood, NJ 08701	(866) 275-4240 www.dom.com/products	R/C ACTIVE

DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102	(877) 332-2450 www.dtesupply.com	C/I ACTIVE
Energy.me Midwest LLC 90 Washington Blvd Bedminster, NJ 07921	(855) 243-7270 www.energy.me	R/C/I ACTIVE
Energy Plus Holdings LLC 309 Fellowship Road East Gate Center, Suite 200 Mt. Laurel, NJ 08054	(877) 866-9193 www.energypluscompany.com	R/C ACTIVE
Ethical Electric Benefit Co. d/b/a Ethical Electric 100 Overlook Center, 2 nd Fl. Princeton, NJ 08540	(888) 444-9452 www.ethicalelectric.com	R/C ACTIVE
FirstEnergy Solutions 300 Madison Avenue Morristown, NJ 07962	(800) 977-0500 www.fes.com	C/I ACTIVE
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	(800) 805-8586 www.gesc.com	R/C/I ACTIVE
GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, NJ 08837	(866) 999-8374 www.gdfsuezenergyresources.com	C/I ACTIVE
Glacial Energy of New Jersey, Inc. 75 Route 15 Building E Lafayette, NJ 07848	(888) 452-2425 www.glacialenergy.com	C/I ACTIVE
Global Energy Marketing LLC 129 Wentz Avenue Springfield, NJ 07081	(800) 542-0778 www.globalp.com	C/I ACTIVE
Green Mountain Energy Company 211 Carnegie Center Drive Princeton, NJ 08540	(866) 767-5818 www.greenmountain.com/commercial-home	C/I ACTIVE

Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	C/I ACTIVE
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	R/C ACTIVE
HOP Energy, LLC d/b/a Metro Energy, HOP Fleet Fueling, HOP Energy Fleet Fueling 1011 Hudson Avenue Ridgefield, NJ 07657	(877) 390-7155 www.hopenergy.com	R/C/I ACTIVE
Hudson Energy Services, LLC 7 Cedar Street Ramsey, New Jersey 07446	(877) Hudson 9 www.hudsonenergyservices.com	C ACTIVE
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	(877) 887-6866 www.idtenergy.com	R/C ACTIVE
Independence Energy Group, LLC 3711 Market Street, 10 th Fl. Philadelphia, PA 19104	(877) 235-6708 www.chooseindependence.com	R/C ACTIVE
Integrus Energy Services, Inc. 99 Wood Ave, South, Suite 802 Iselin, NJ 08830	(877) 763-9977 www.integrusenergy.com	C/I ACTIVE
Keil & Sons, Inc. d/b/a Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	(877) 797-8786 www.systrumenergy.com	R/C/I ACTIVE
Liberty Power Delaware, LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	(866) 769-3799 www.libertypowercorp.com	C/I ACTIVE
Liberty Power Holdings, LLC 1973 Highway 34, Suite 211 Wall, NJ 07719	(866) 769-3799 www.libertypowercorp.com	C/I ACTIVE

Linde Energy Services 575 Mountain Avenue Murray Hill, NJ 07974	(800) 247-2644 www.linde.com	C/I ACTIVE
Marathon Power LLC 302 Main Street Paterson, NJ 07505	(888) 779-7255 www.mecny.com	R/C/I ACTIVE
MXenergy Electric Inc. 900 Lake Street Ramsey, NJ 07446	(800) 785-4374 www.mxenergy.com	R/C/I ACTIVE
NATGASCO, Inc. 532 Freeman St. Orange, NJ 07050	(973) 678-1800 x. 251 www.supremeenergyinc.com	R/C ACTIVE
NextEra Energy Services New Jersey, LLC 651 Jernee Mill Road Sayreville, NJ 08872	(877) 528-2890 Commercial (800) 882-1276 Residential www.nexteraenergyservices.com	R/C/I ACTIVE
New Jersey Gas & Electric 1 Bridge Plaza fl. 2 Fort Lee, NJ 07024	(866) 568-0290 www.NJGandE.com	R/C ACTIVE
Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th Floor Woodbridge, NJ 07095	(877) 273-6772 www.noblesolutions.com	C/I ACTIVE
North American Power and Gas, LLC 222 Ridgedale Avenue Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	R/C/I ACTIVE
Palmco Power NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	R/C/I ACTIVE
Pepco Energy Services, Inc. 112 Main St. Lebanon, NJ 08833	(800) ENERGY-9 (363-7499) www.pepco-services.com	C/I ACTIVE
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	R/C/I ACTIVE

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

UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(856) 273-9995 www.ugienergyservices.com	C/I ACTIVE
Verde Energy USA, Inc. 50 East Palisades Avenue Englewood, NJ 07631	(800) 388-3862 www.lowcostpower.com	R/C/I ACTIVE
Viridian Energy 2001 Route 46, Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	R/C/I ACTIVE
Xoom Energy New Jersey, LLC 744 Broad Street Newark, NJ 07102	(888) 997-8979 www.xoomenergy.com	R/C/I ACTIVE
YEP Energy 89 Headquarters Plaza North #1463 Morristown, NJ 07960	(855) 363-7736 www.yepenergyNJ.com	R/C/I ACTIVE
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	(855) 732-2493 www.thisisyourenergy.com	R/C/I ACTIVE

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ELIZABETHTOWN GAS CO. SERVICE TERRITORY
Last Updated: 12/11/14

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

Supplier	Telephone & Web Site	*Customer Class
Abest Power & Gas of NJ, LLC 202 Smith Street Perth Amboy, NJ 08861	(888) 987-6937 www.AbestPower.com	R/C/I ACTIVE
Alpha Gas and Electric, LLC 641 5 th Street Lakewood, NJ 08701	855-553-6374 www.alphagasandelectric.com	R/C ACTIVE
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	201-384-5552 www.astralenergyllc.com	R/C/I ACTIVE
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greasternenergy.com	C ACTIVE
Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	(888) 565-4490 www.4choiceenergy.com	R/C/I
Clearview Electric Inc. d/b/a Clearview Gas 1744 Lexington Ave. Pennsauken, NJ 08110	800-746-4720 www.clearviewenergy.com	R/C ACTIVE
Colonial Energy, Inc. 83 Harding Road Wyckoff, NJ 07481	845-429-3229 www.colonialgroupinc.com	C/I ACTIVE
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07746	888-817-8572 www.commerceenergy.com	R ACTIVE
Compass Energy Services, Inc. 33 Wood Avenue South, Suite 610 Iselin, NJ 08830	866-867-8328 www.compassenergy.net	C/I ACTIVE
ConocoPhillips Company 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-646-4427 www.conocophillips.com	C/I ACTIVE
Consolidated Edison Solutions, Inc. Cherry Tree Corporate Center 535 State Highway 38, Suite 140	888-665-0955	C/I

Cherry Hill, NJ 08002	www.conedsolutions.com	ACTIVE
Constellation NewEnergy-Gas Division, LLC 116 Village Boulevard, Suite 200 Princeton, NJ 08540	800-785-4373 www.constellation.com	C/I ACTIVE
Constellation Energy Gas Choice, Inc. 116 Village Blvd., Suite 200 Princeton, NJ 08540	800-785-4373 www.constellation.com	R/C/I ACTIVE
Direct Energy Business Marketing, LLC (fka Hess Energy Marketing, LLC) One Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 http://www.business.directenergy.com/	C/I ACTIVE
Direct Energy Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	866-547-2722 www.directenergy.com	R/C/I INACTIVE
Direct Energy Small Business, LLC(fka Hess Small Business Services, LLC) One Hess Plaza Woodbridge, NJ 07095	(888) 464-4377 http://www.business.directenergy.com/	C/I ACTIVE
Energy Plus Natural Gas LP 309 Fellowship Road, East Gate Center Suite 200 Mt. Laurel, NJ 08054	877-866-9193 www.energypluscompany.com	R/C ACTIVE
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergyservices.com	C/I ACTIVE
Gateway Energy Services Corporation 120 Wood Avenue, Suite 611 Iselin, NJ 08830	800-313-8333 Residential 800-715-8777 Commercial www.gesc.com	R/C ACTIVE
Glacial Energy of New Jersey, Inc. 21 Pine Street, Suite 237 Rockaway, NJ 07866	1-888-452-2425 www.glacialenergy.com	C/I ACTIVE
Global Energy Marketing LLC 129 Wentz Avenue Springfield, NJ 07081	800-542-0778 www.globalp.com	C/I ACTIVE
Great Eastern Energy 116 Village Blvd., Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	C/I ACTIVE
Greenlight Energy 330 Hudson Street, Suite 4	718-204-7467	C

Hoboken, NJ 07030	www.greenlightenergy.us	ACTIVE
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	C/I ACTIVE
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	888-264-4908 www.hikoenergy.com	R/C/I ACTIVE
Infinite Energy dba Intelligent Energy 1200 Route 22 East Suite 2000 Bridgewater, NJ 08807-2943	(800) 927-9794 www.InfiniteEnergy.com	R/C/I ACTIVE
Marathon Power LLC 302 Main Street Paterson, NJ 07505	888-779-7255 www.mecny.com	R/C/I ACTIVE
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	1-877-750-7046 www.metromediaenergy.com	C/I ACTIVE
NATGASCO (Supreme Energy, Inc.) 532 Freeman Street Orange, NJ 07050	800-840-4427 www.supremeenergyinc.com	R/C ACTIVE
Naughton Energy Corporation 1898 Route 940, Box 709 Pocono Pines, PA 18350	800-372-6942 www.naughtonenergy.com	C/I ACTIVE
New Energy Services LLC 101 Neptune Ave. Deal, NJ 07723`	800-660-3643 www.newenergyservicesllc.com	R/C/I ACTIVE
North Eastern States, Inc. d/b/a Entrust Energy 90 Washington Valley Road Bedminster, NJ 07921	(888) 535-6340 www.entrustenergy.com	R/C/I ACTIVE
Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	R/C/I ACTIVE
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	855-32-POWER (76937) www.plymouthenergy.com	R/C/I ACTIVE
Power Management Co., LLC d/b/a PMC Lightsavers Limited Liability Company 1600 Moseley Road Victor, NY 14564	(585) 249-1360 www.powermanagementco.com	C/I ACTIVE

PPL EnergyPlus, LLC Shrewsbury Executive Offices 788 Shrewsbury Avenue Suite 2200 Tinton Falls, NJ 07724	(732) 741-0505 www.pplenergyplus.com	C/I ACTIVE
PPL EnergyPlus Retail, LLC Shrewsbury Executive Offices 788 Shrewsbury Avenue, Suite 220 Tinton Falls, NJ 07724	(732) 741-0505 – 2000 www.pplenergyplus.com	C/I ACTIVE
Progressive Energy Consulting, LLC PO Box 4582 Wayne, New Jersey 07474	(917) 837-7400 Progressivenrg@optionline.net	R/C/I ACTIVE
Prospect Resources, Inc. Incorp. Services Inc. 208 W. State Street Trenton, NJ 08608-1002	(847) 673-1959 www.prospectresources.com	C ACTIVE
Residents Energy, LLC 550 Broad Street Newark, NJ 07102	(888) 828-7374 www.residentsenergy.com	R/C
Respond Power LLC 1001 East Lawn Drive Teaneck, NJ 07666	877-973-7763 www.respondpower.com	R/C/I ACTIVE
RTE Enterprises, LLC 8 Gary Lane Califon, NJ 07830	N/A www.RTEenterprises.net	C/I ACTIVE
Save on Energy, LLC 1101 Red Ventures Drive Fort Mill, SC 29707	1 (877) 658-3183 www.saveonenergy.com	R/C ACTIVE
SIMEC, LLC 116 Village Blvd. Suite 200 Princeton, NJ 08540	(917) 620-0249 www.simecenergy.com	R/C/I
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	800-266-6020 www.southjerseyenergy.com	R/C/I ACTIVE
Sperian Energy Corp. Bridgewater Center 1200 Route 22 East Bridgewater, NJ 08807	888-682-8082 www.sperianenergy.com	R/C/I ACTIVE
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	855-466-2842 www.spragueenergy.com	C/I ACTIVE
Stream Energy New Jersey, LLC 309 Fellowship Road, Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	R/C ACTIVE

Summit Energy Services, Inc. 10350 Ormsby Park Place Suite 400 Louisville, KY 40223	1 (800) 90-SUMMIT www.summitenergy.com	C/I ACTIVE
Tiger Natural Gas, Inc. dba Tiger, Inc. 234 20 th Avenue Brick, NJ 008724	888-875-6122 www.tignaturalgas.com	R/C/I ACTIVE
UGI Energy Services, Inc. dba UGI Energy Link 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	800-427-8545 www.ugienerylink.com	C/I ACTIVE
Vista Energy Marketing, L.P. 197 State Route 18 South, Suite 3000 South Wing East Brunswick, NJ 08816	888-508-4782 www.vistaenergymarketing.com	R/C/I ACTIVE
Woodruff Energy 73 Water Street Bridgeton, NJ 08302	800-557-1121 www.woodruffenergy.com	R/C/I ACTIVE
Woodruff Energy US LLC 73 Water St., P.O. Box 777 Bridgeton, NJ 08302	856-455-1111 800-557-1121 www.woodruffenergy.com	C/I ACTIVE
XOOM Energy New Jersey, LLC 744 Broad Street. 16th Floor Newark, NJ 07102	(888) 997-8979 www.xoomenergy.com	R/C/I ACTIVE
Your Energy Holdings, LLC One International Boulevard, Suite 400 Mahwah, NJ 07495-0400	855-732-2493 www.thisisyourenergy.com	R/C/I ACTIVE

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APPENDIX B

Equipment Inventory

CHA Project # 29743
Municipal Garage
1901 Lower Road, Linden, NJ 07036

[illegible]

APPENDIX C

ECM Calculations

City of Linden LGEA
CHA Project Numer: 29743

Rate of Discount (used for NPV) 3.0%

Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
\$	0.138	\$/kWh blended	0.000420205	14,000	Electric	Natural Gas	Water
\$	0.112	\$/kWh supply	0.000420205		\$ 10,307	\$ 31,798	\$ 1,264
\$	4.29	\$/kW	0				
\$	1.19	\$/Therm	0.00533471				
\$	42.12	\$/kgals	0				
		\$/Gal					

Municipal Garage																							
Recommend? Y or N		Item	Savings					Cost	Simple Payback	Life Expectancy	Equivalent CO ₂ (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings					ROI	NPV	IRR	
			kW	kWh	therms	No. 2 Oil gal	Water kgal								\$	kW	kWh	therms	kgal/yr				\$
Y	ECM-1	Install gas infrared heaters	0.0	31,250	9,208	0	0	15,232	\$ 119,153	7.8	13	62.3	\$ 3,900	N	7.6	0.0	406,250	119,709	0	\$ 198,018	0.7	\$46,740	8.8%
Y	ECM-2	Add window A/C unit controllers	0.0	1,435	0	0	0	198	\$ 400	2.0	20	0.6	\$ -	N	2.0	0.0	28,707	0	0	\$ 3,951	8.9	\$2,539	49.4%
N	ECM-3	Replace gas water heater with high efficiency condensing water heater	0.0	0	88	0	0	105	\$ 4,446	42.4	20	0.5	\$ 150	Y	41.0	0.0	0	1,768	0	\$ 2,098	(0.5)	(\$2,735)	-6.0%
N	ECM-4	Replace Garage Doors	0.0	0	957	0	0	1,136	\$ 33,463	29.5	15	5.1	\$ -	N	29.5	0.0	0	14,352	0	\$ 17,036	(0.5)	(\$19,904)	-7.5%
Y	ECM-5	Install wall insulation	0.0	175	1,884	0	0	2,261	\$ 13,900	6.1	20	10.1		N	6.1	0.0	3,500	37,683	0	\$ 45,212	2.3	\$19,732	15.3%
Y	ECM-6	Install Programmable Thermostats for radiant heaters	0.0	0	615	0	0	730	\$ 5,363	7.4	15	3.3	\$ 975	N	6.0	0.0	0	9,219	0	\$ 10,943	1.0	\$4,322	14.4%
N	ECM-7	Window replacement	0.0	0	727	0	0	863	\$ 93,100	107.9	20	3.9	\$ -	N	107.9	0.0	0	14,541	0	\$ 17,260	(0.8)	(\$80,260)	-12.5%
N	ECM-L1	Lighting Replacements / Upgrades	2	5,075	0	0	0	693	\$ 4,725	6.8	15	2.1	\$ -	N	6.8	36.6	76,128	0	0	\$ 12,364	1.6	\$3,543	12.0%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0	2,096		0	0	289	\$ 770	2.7	15	0.9	\$ 120	N	2.3	0.0	31,443	0	0	\$ 4,328	4.6	\$2,795	44.2%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	2	6,156	0	0	0	813	\$ 5,495	6.8	15	2.6	\$ 120	N	6.6	36.6	92,346	0	0	\$ 14,596	1.7	\$4,336	12.6%
Total			2.4	39,017	13,479	0	0	\$ 21,337	\$ 275,319	12.9	17.3	88	\$ 5,145		12.7	37	530,803	197,270	-	\$ 309,116	0.1	(25,230)	3.5%
Recommended Measures (highlighted green above)			2.4	39,017	11,707	0	0	\$ 19,233	\$ 144,310	7.5	16.6	79	\$ 4,995	0	7.2	37	530,803	166,610	-	\$ 272,721	0.9	77,670	11.3%
% of Existing			5%	52%	44%	0	0																

City:		Newark, NJ				
Occupied Hours/Week		168				
		Building	Auditorium	Gymnasium	Library	Classrooms
Temp	Enthalpy h (Btu/lb)	Operating Hours	Occupied Hours	Occupied Hours	Occupied Hours	Occupied Hours
102.5						
97.5	35.4	6	6	0	0	0
92.5	37.4	31	31	0	0	0
87.5	35.0	131	131	0	0	0
82.5	33.0	500	500	0	0	0
77.5	31.5	620	620	0	0	0
72.5	29.9	664	664	0	0	0
67.5	27.2	854	854	0	0	0
62.5	24.0	927	927	0	0	0
57.5	20.3	600	600	0	0	0
52.5	18.2	730	730	0	0	0
47.5	16.0	491	491	0	0	0
42.5	14.5	656	656	0	0	0
37.5	12.5	1,023	1,023	0	0	0
32.5	10.5	734	734	0	0	0
27.5	8.7	334	334	0	0	0
22.5	7.0	252	252	0	0	0
17.5	5.4	125	125	0	0	0
12.5	3.7	47	47	0	0	0
7.5	2.1	34	34	0	0	0
2.5	1.3	1	1	0	0	0
-2.5						
-7.5						

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

Heating System Efficiency	78%
Cooling Eff (kW/ton)	1.3

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

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

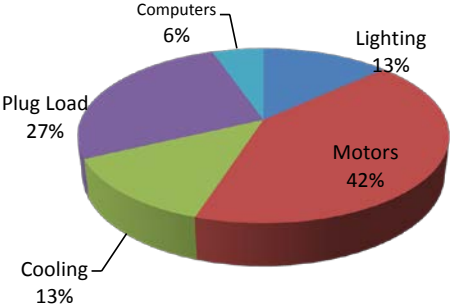
Utility End Use Analysis			
Electricity Use (kWh):		Notes/Comments:	
74,876	Total	Based on utility analysis	
9,926	Lighting	From Lighting Calculations	
31,250	Motors	Estimated	
9,700	Cooling	Estimated	
20,000	Plug Load	Estimated	
4,000	Computers	Estimated	
Natural Gas Use (Therms):		Notes/Comments:	
26,788	Total	Based on utility analysis	
26,693	Boiler	Therms/SF x Square Feet Served	
95	Water Heater	Estimated	
Water (Gallons)		Notes/Comments	
30,000	Total		
30,000	Garage Usage	Gallons/year	

13%
 42%
 13%
 27%
 5%

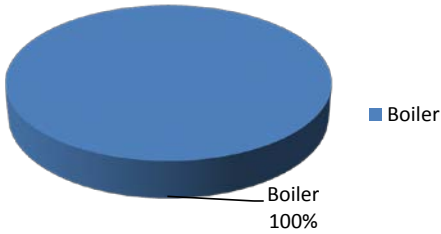
100%
 0%

100%

Electricity Use (kWh):



Natural Gas End Use



City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

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

ECM-7 Window replacement

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

Linear Feet of panel Edge	320.0 LF	Cooling System Efficiency	0 kW/ton	Heating System Efficiency	78%
Area of Panel	672.0 SF	Ex Occupied Cing Temp.	72 °F	Heating On Temp.	60 °F
Existing Infiltration Factor	0.50 cfm/LF	Ex Unoccupied Cing Temp.	72 °F	Ex Occupied Htg Temp.	72 °F
Proposed Infiltration Factor	0.40 cfm/LF	Cooling Occ Enthalpy Setpoint	27.5 Btu/lb	Ex Unoccupied Htg Temp.	72 °F
Existing U Value	1.00 Btu/h/SF°F	Cooling Unocc Enthalpy Setpoint	27.5 Btu/lb	Electricity	\$ 0.138 \$/kWh
Proposed U Value	0.60 Btu/h/SF°F			Natural Gas	\$ 1.19 \$/therm

				EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY		
				Occupied	Unoccupied	Occupied	Unoccupied					
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Panel Infiltration & Heat Load BTUH	Panel Infiltration & Heat Load BTUH	Panel Infiltration & Heat Load BTUH	Panel Infiltration & Heat Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Therms	Proposed Heating Energy Therms
A		B	C	D	E	F	G	H	I	J	K	L
102.5	50.1	0	0	0	-36,768	-36,768	-25,315	-25,315	0	0	0	0
97.5	42.5	6	2	4	-27,936	-27,936	-18,922	-18,922	0	0	0	0
92.5	39.5	45	16	29	-22,416	-22,416	-15,178	-15,178	0	0	0	0
87.5	36.6	146	52	94	-16,968	-16,968	-11,491	-11,491	0	0	0	0
82.5	34.0	298	106	192	-11,736	-11,736	-7,978	-7,978	0	0	0	0
77.5	31.6	476	170	306	-6,648	-6,648	-4,579	-4,579	0	0	0	0
72.5	29.2	662	237	426	-1,560	-1,560	-1,181	-1,181	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	12,250	12,250	7,851	7,851	0	0	115	74
52.5	18.7	668	239	430	16,474	16,474	10,558	10,558	0	0	141	90
47.5	16.2	659	235	424	20,698	20,698	13,265	13,265	0	0	175	112
42.5	14.4	685	245	441	24,922	24,922	15,972	15,972	0	0	219	140
37.5	12.6	739	264	475	29,146	29,146	18,680	18,680	0	0	276	177
32.5	10.7	717	256	461	33,370	33,370	21,387	21,387	0	0	307	197
27.5	8.6	543	194	349	37,594	37,594	24,094	24,094	0	0	262	168
22.5	6.8	318	114	205	41,818	41,818	26,801	26,801	0	0	171	109
17.5	5.5	245	88	158	46,042	46,042	29,508	29,508	0	0	145	93
12.5	4.1	156	56	100	50,266	50,266	32,216	32,216	0	0	101	64
7.5	2.6	92	33	59	54,490	54,490	34,923	34,923	0	0	64	41
2.5	1.0	36	13	23	58,714	58,714	37,630	37,630	0	0	27	17
-2.5	0.0	19	7	12	62,938	62,938	40,337	40,337	0	0	15	10
-7.5	-1.5	8	3	5	67,162	67,162	43,044	43,044	0	0	7	4
TOTALS		8,760	3,129	5,631					0	0	2,025	1,298

Existing Panel Infiltration	160 cfm	Savings	727 Therms	\$ 863
Existing Panel Heat Transfer	672 Btu/h°F		0 kWh	\$ -
Proposed Panel Infiltration	128 cfm			\$ 863
Proposed Panel Heat Transfer	403 Btu/h°F			

Panel 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	Whole Building	8	6	14	320.0	672.0	0.5	1	160.0	672.0
Total		8	6	14	320.0	672.0	0.50	1.00	160.0	672.0

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-7 - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Window Replacement	672	sqft	\$ 65	\$ 40	\$ -	\$ 43,680	\$ 26,880	\$ -	\$ 70,560	Vendor Est per SF

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

\$ 70,560	Subtotal
\$ 7,056	10% Contingency
\$ 15,523	20% Contractor O&P
\$ -	0% Engineering Fees
\$ 93,100	Total

ECM-1 Install gas infrared heaters

Description: The existing heating system consists of a hot water boiler supplying several ceiling mounted unit heaters. This system has poor efficiency and has surpassed its useful life. This ECM evaluates the energy savings associated with adding gas fired radiant heaters to the garage bays and abandoning the hot water heating system.

EXISTING CONDITIONS		
Existing Facility Total Natural Gas Usage	26,788	Therms
Existing Equipment Usage	1,406,370	Mbtu/yr
Proposed Heating Gas Usage	17,580	Therms
Total energy savings	9,208	Therms
Total cost savings	\$10,931	

Assumptions

	\$ 1.19	\$/Therm
1	70%	Existing Unit heater operating efficiency
2	75%	Existing Unit Distribution Effectiveness
3	80%	Proposed infrared heater operational efficiency
4	100%	Proposed Unit Distribution Effectiveness

City of Linden LGEA
 CHA Project Numer: 29743
 Municipal Garage

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-1 Install gas infrared heaters

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									\$ -	
Two-Stage Ceiling Mounted Radiant Heater	13	EA	\$ 2,500	\$ 1,000	INC	\$ 33,378	\$ 16,198	INC	\$ 49,576	Grainger.com
Venting and combustion air	13	EA	\$ 500	\$ 500		\$ 6,676	\$ 8,099	\$ -	\$ 14,775	Estimated
Gas Piping	13	EA	\$ 500	\$ 1,500		\$ 6,676	\$ 24,297	\$ -	\$ 30,973	Estimated

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

\$ 95,323	Subtotal
\$ 23,831	25% Contingency
\$ 119,153	Total

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

ECM-2

Add window A/C unit controllers

ECM Description : Window A/C units are currently controlled manually by the occupants and are not turned off when the room is unoccupied. This ECM evaluates

**COOLING
CAPACITY
(btu/h)**

EQUIPMENT	AREA/EQUIPMENT SERVED	
Window AC Units	Offices	48,000

Total btu/h of all window A/C Units: 48,000 btu/h

4

ASSUMPTIONS		Comments
Electric Cost	\$0.138 / kWh	
Average run hours per Week	50 Hours	
Space Balance Point	55 F	
Space Temperature Setpoint	72 deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	48,000 Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	10.0	
Existing Annual Electric Usage	2,789 kWh	

Item	Value	Units	Comments
Proposed Annual Electric Usage	1,353	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS	
Annual Electrical Usage Savings	1,435 kWh
Annual Cost Savings	\$198
Total Project Cost	\$400
Simple Payback	2 years

OAT - DB Bin Temp F	Annual Hours	Existing Hours of Operation	Proposed % of time of operation	Proposed hrs of Operation
102.5	0	0	100%	0
97.5	6	2	89%	2
92.5	31	9	79%	7
87.5	131	39	68%	27
82.5	500	149	58%	86
77.5	620	185	47%	87
72.5	664	198	37%	73
67.5	854	0	0%	0
62.5	927	0	0%	0
57.5	600	0	0%	0
52.5	730	0	0%	0
47.5	491	0	0%	0
42.5	656	0	0%	0
37.5	1,023	0	0%	0
32.5	734	0	0%	0
27.5	334	0	0%	0
22.5	252	0	0%	0
17.5	125	0	0%	0
12.5	47	0	0%	0
7.5	34	0	0%	0
2.5	1	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0

Total	8,760	581	49%	282
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City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-2 - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						0	\$ -	\$ -	\$ -	
Window AC Controller	2	EA	\$ 150	\$ -	\$ -	308.1	\$ -	\$ -	\$ 308	Estimated
						\$ -	\$ -	\$ -	\$ -	

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

\$ 308	Subtotal
\$ 77	25% Contingency
\$ 400	Total

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

#REF!

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

<u>Item</u>	<u>Value</u>	<u>Units</u>	<u>Formula/Comments</u>
Avg. Monthly Utility Demand by Water Heater	317	Gallons/month	Estimated
Total Annual Utility Demand by Water Heater	9,500	MBTU/yr	From Utility breakdown
Existing DHW Heater Efficiency	80%		Estimated
Total Annual Hot Water Demand (w/ standby losses)	7,600	MBTU/yr	
Existing Tank Size	75	Gallons	Per manufacturer nameplate
Hot Water Piping System Capacity	5	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	120	°F	Per building personnel
Room Temperature	72	°F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	0.8	MBH	
Annual Standby Hot Water Load	6,964	MBTU/yr	
New Tank Size	1	Gallons	Tankless
Hot Water Piping System Capacity	5	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	120	°F	
Room Temperature	72	°F	
Standby Losses (% by Volume)	0.00%		Tankless= no standby losses
Standby Losses (Heat Loss)	0.0	MBH	
Annual Standby Hot Water Load	0	MBTU/yr	
Proposed Annual Hot Water demand	636	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		
Proposed Fuel Use	7	Therms	Standby Losses and inefficient DHW heater eliminated
Therm savings per year	88		
Utility Cost	\$1.19	\$/Therm	
Existing Operating Cost of DHW	\$113	\$/yr	
Proposed Operating Cost of DHW	\$8	\$/yr	
Annual Savings	\$105	\$/yr	

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-3 Replace gas water heater with high efficiency condensing water heater

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	RS Means 2012
High Efficiency Gas-Fired DHW Heater (Tankless)	1	EA	\$ 2,000	\$ 500		\$ 2,054	\$ 623	\$ -	\$ 2,677	Estimated based on Internet Price
Miscellaneous Electrical	1	EA	\$ 50	\$ 150		\$ 51	\$ 187	\$ -	\$ 238	RS Means 2012
Venting Kit	1	EA	\$ 100	\$ 100		\$ 103	\$ 125	\$ -	\$ 227	Estimated
Miscellaneous Piping and Valves	1	EA	\$ 100	\$ 250		\$ 103	\$ 312	\$ -	\$ 414	Estimated

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

\$ 3,557	Subtotal
\$ 889	25% Contingency
\$ 4,446	Total

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

ECM-4 Replace Garage Doors

Desription: The building has uninsulated garage doors with glass panels. This ECM evaluates replacing the overhead garage doors with insulated garage doors having less glass area. Note: no cooling savings are calculated as the garage Proposed: Replace garage doors with fully insulated doors.

Linear Feet of panel Edge	380.0 LF	Cooling System Efficiency	0 kW/ton	Heating System Efficiency	78%
Area of Panel	900.0 SF	Ex Occupied Cing Temp.	72 °F	Heating On Temp.	55 °F
Existing Infiltration Factor	0.60 cfm/LF	Ex Unoccupied Cing Temp.	72 °F	Ex Occupied Htg Temp.	70 °F
Proposed Infiltration Factor	0.40 cfm/LF	Cooling Occ Enthalpy Setpoint	27.5 Btu/lb	Ex Unoccupied Htg Temp.	70 °F
Existing U Value	1.10 Btuh/SF°F	Cooling Unocc Enthalpy Setpoint	27.5 Btu/lb	Electricity	\$ 0.138 \$/kWh
Proposed U Value	0.60 Btuh/SF°F			Natural Gas	\$ 1.19 \$/therm

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY		
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Air	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Occupied Panel	Unoccupied Panel	Occupied Panel	Unoccupied Panel	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Therms	Proposed Heating Energy Therms
						Infiltration & Heat Load BTUH	Infiltration & Heat Load BTUH	Infiltration & Heat Load BTUH	Infiltration & Heat Load BTUH				
						E	F	G	H				
A			B	C	D	E	F	G	H	I	J	K	L
102.5	50.1		0	0	0	-53,383	-53,383	-31,928	-31,928	0	0	0	0
97.5	42.5		6	6	0	-40,635	-40,635	-24,030	-24,030	0	0	0	0
92.5	39.5		31	31	0	-32,607	-32,607	-19,278	-19,278	0	0	0	0
87.5	36.6		131	131	0	-24,682	-24,682	-14,594	-14,594	0	0	0	0
82.5	34.0		500	500	0	-17,064	-17,064	-10,116	-10,116	0	0	0	0
77.5	31.6		620	620	0	-9,652	-9,652	-5,774	-5,774	0	0	0	0
72.5	29.2		664	664	0	-2,239	-2,239	-1,433	-1,433	0	0	0	0
67.5	27.0		854	854	0	0	0	0	0	0	0	0	0
62.5	24.5		927	927	0	0	0	0	0	0	0	0	0
57.5	21.4		600	600	0	0	0	0	0	0	0	0	0
52.5	18.7		730	730	0	21,634	21,634	12,323	12,323	0	0	202	115
47.5	16.2		491	491	0	27,815	27,815	15,844	15,844	0	0	175	100
42.5	14.4		656	656	0	33,997	33,997	19,364	19,364	0	0	286	163
37.5	12.6		1,023	1,023	0	40,178	40,178	22,885	22,885	0	0	527	300
32.5	10.7		734	734	0	46,359	46,359	26,406	26,406	0	0	436	248
27.5	8.6		334	334	0	52,540	52,540	29,927	29,927	0	0	225	128
22.5	6.8		252	252	0	58,721	58,721	33,448	33,448	0	0	190	108
17.5	5.5		125	125	0	64,903	64,903	36,968	36,968	0	0	104	59
12.5	4.1		47	47	0	71,084	71,084	40,489	40,489	0	0	43	24
7.5	2.6		34	34	0	77,265	77,265	44,010	44,010	0	0	34	19
2.5	1.0		1	1	0	83,446	83,446	47,531	47,531	0	0	1	1
-2.5	0.0		0	0	0	89,627	89,627	51,052	51,052	0	0	0	0
-7.5	-1.5		0	0	0	95,809	95,809	54,572	54,572	0	0	0	0
TOTALS			8,760	8,760	0					0	0	2,223	1,266

Existing Panel Infiltration	228 cfm	Savings	957 Therms	\$ 1,136
Existing Panel Heat Transfer	990 Btuh/°F			
Proposed Panel Infiltration	152 cfm			
Proposed Panel Heat Transfer	540 Btuh/°F			\$ 1,136

Panel 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	Garage door	10	9	10	380.0	900.0	0.6	1.1	228.0	990.0
Total		10	9	10	380.0	900.0	0.60	1.10	228.0	990.0

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

ECM-4 - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									\$ -	
Rollup Garage Door	10	EA	\$ 2,000	\$ 500	\$ -	\$ 20,540	\$ 6,230	\$ -	\$ 26,770	Estimated based on Internet Price
						\$ -	\$ -	\$ -	\$ -	

\$ 26,770	Subtotal
\$ 6,693	25% Contingency
\$ 33,463	Total

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

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

ECM-5 Install wall insulation

Description: Currently the exterior walls are block with no insuation. This measure evaluates adding 1" thick polyisocyanuratefoam board insulation with R value 6.5 on the interior of the exterior walls.

Wall Area	6,760 SF	Cooling System Efficiency	1.3 kW/ton	Heating System Efficiency	78%
Existing Infiltration Factor	0.23 cfm/SF	Ex Occupied Cng Temp.	72 °F	Heating On Point	55 °F
Proposed Infiltration Factor	0.23 cfm/SF	Ex Unoccupied Cng Temp.	72 °F	Ex Occupied Htg Temp.	70 °F
Existing U Value	0.250 Btuh/SF°F	Cooling Occ Enthalpy Setpoint	27.5 Btu/lb	Ex Unoccupied Htg Temp.	70 °F
Proposed U Value	0.095 Btuh/SF°F	Cooling Unocc Enthalpy Setpoint	27.5 Btu/lb	Electricity	\$ 0.138 \$/kWh
Air Conditioned Area %	12%			Natural Gas	\$ 1.19 \$/Therm

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied		Unoccupied					
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Wall Infiltration & Heat Load BTUH	Wall Infiltration & Heat Load BTUH	Wall Infiltration & Heat Load BTUH	Wall Infiltration & Heat Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy therms	Proposed Heating Energy therms
A		B	C	D	E	F	G	H	I	J	K	L
97.5	35.4	6	6	0	-11,810	-11,810	-8,604	-8,604	8	6	0	0
92.5	37.4	31	31	0	-12,471	-12,471	-9,893	-9,893	42	33	0	0
87.5	35.0	131	131	0	-9,428	-9,428	-7,479	-7,479	134	106	0	0
82.5	33.0	500	500	0	-6,787	-6,787	-5,466	-5,466	368	296	0	0
77.5	31.5	620	620	0	-4,514	-4,514	-3,822	-3,822	303	257	0	0
72.5	29.9	664	664	0	-17,678	-17,678	-17,155	-17,155	1272	1234	0	0
67.5	27.2	854	854	0	0	0	0	0	0	0	0	0
62.5	24.0	927	927	0	0	0	0	0	0	0	0	0
57.5	20.3	600	600	0	0	0	0	0	0	0	0	0
52.5	18.2	730	730	0	58,961	58,961	40,624	40,624	0	0	552	380
47.5	16.0	491	491	0	75,807	75,807	52,231	52,231	0	0	477	329
42.5	14.5	656	656	0	92,653	92,653	63,838	63,838	0	0	779	537
37.5	12.5	1,023	1,023	0	109,498	109,498	75,445	75,445	0	0	1,436	989
32.5	10.5	734	734	0	126,344	126,344	87,052	87,052	0	0	1,189	819
27.5	8.7	334	334	0	143,190	143,190	98,659	98,659	0	0	613	422
22.5	7.0	252	252	0	160,036	160,036	110,266	110,266	0	0	517	356
17.5	5.4	125	125	0	176,882	176,882	121,873	121,873	0	0	283	195
12.5	3.7	47	47	0	193,728	193,728	133,480	133,480	0	0	117	80
7.5	2.1	34	34	0	210,574	210,574	145,087	145,087	0	0	92	63
2.5	1.3	1	1	0	227,420	227,420	156,693	156,693	0	0	3	2
-2.5	0.0	0	0	0	244,266	244,266	168,300	168,300	0	0	0	0
TOTALS		8,760	8,760	0					2,126	1,932	6,058	4,174

Existing Walls Infiltration	1,555 cfm	Savings	1,884 Therms	\$ 2,237
Existing Walls Heat Transfer	1,690 Btuh/°F		194 kWh	\$ 27
Proposed Walls Infiltration	1,555 cfm			\$ 2,263
Proposed Walls Heat Transfer	642 Btuh/°F			

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

ECM-5 Install wall insulation

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Wall Insulation Cost taken from US DOE website	6,760	SF	\$ 1.00	\$ 0.50		\$ 6,943	\$ 4,211	\$ -	\$ 11,154	Estimated

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

\$ 11,154	Subtotal
\$ 2,789	25% Contingency
\$ 13,900	Total

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

ECM-6 Install Programmable Thermostats for radiant heaters

Discription: This measure assesses the energy savings associated with replacing the a standard non programmable thermostat with a programmable thermostat allowing for

Natural Gas Savings	615	Therms
Cooling Electricity Savings	0	kWh
Total Cost Savings	\$ 730	
Estimated Total Project Cost	\$ 5,363	
Simple Payback	7.4	Yrs

Building Information:

14,000	Sq Footage	\$0.14	\$/kWh Blended
N	Cooling	\$1.19	\$/Therm
Y	Heating		

Nighttime Setback

EXISTING CONDITIONS		
Heating		
Heating Season Facility Temp	70	F
Weekly Occupied Hours	60	hrs
Heating Season Setback Temp	62	F
Heating Season % Savings per Degree Setback	1%	
Annual Boiler Capacity	2,172	Mbtu/yr
Connected Heating Load Capacity	2,172,000	Btu/hr
Equivalent Full Load Heating Hours	900	hrs
Heating Equipment Efficiency	78%	
Cooling		
Cooling Season Facility Temp	-	F
Weekly Occupied Hours	168	hrs
Cooling Season Setback Temp	80	F
Cooling Season % Savings per Degree Setback		
Connected Cooling Load Capacity	15	Tons
Equivalent Full Load Cooling Hours	381	hrs
Cooling Equipment EER	13.0	
No Significant Cooling in Bldg		
SAVINGS		
Natural Gas Savings	615	Therms ³
Cooling Electricity Savings	0	kWh

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

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-6 - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						\$ -	\$ -	\$ -	\$ -	
Controller & Programming	13	EA	\$ 200	\$ 100		\$ 2,670	\$ 1,620	\$ -	\$ 4,290	Estimated
						\$ -	\$ -	\$ -	\$ -	
						\$ -	\$ -	\$ -	\$ -	

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

\$ 4,290	Subtotal
\$ 1,073	25% Contingency
\$ 5,363	Total

City of Linden LGEA
CHA Project Numer: 29743
Municipal Garage

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)	14,000
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)	\$10,307	\$31,798
Existing Usage (from utility)	74,876	26,788
Proposed Savings	39,017	11,707
Existing Total MMBtus	2,934	
Proposed Savings MMBtus	1,304	
% Energy Reduction	44.4%	
Proposed Annual Savings	\$19,233	

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

	Incentives \$		
	Elec	Gas	Total
Incentive #1	\$0	\$0	\$5,000
Incentive #2	\$4,292	\$14,634	\$18,926
Incentive #3	\$4,292	\$14,634	\$18,926
Total All Incentives	\$8,584	\$29,268	\$42,851

Total Project Cost	\$144,310
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		Allowable Incentive
% Incentives #1 of Utility Cost*	11.9%	\$5,000
% Incentives #2 of Project Cost**	13.1%	\$18,926
% Incentives #3 of Project Cost**	13.1%	\$18,926
Total Eligible Incentives***	\$42,851	
Project Cost w/ Incentives	\$101,459	

Project Payback (years)	
w/o Incentives	w/ Incentives
7.5	5.3

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

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

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

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

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

COST TABLE

Field Code	Existing Standard Code	Fixture Code	Watts per fixture	Retrofit	Retrofit Standard Code	Retrofit Code	Watts per fixture	Fixture Replacement			Ballast Replacement			Lamp Replacement			O.P. & D	NJ Incentive	Retrofit Cost (inc. O&P)
								Material	Labor	Disposal	Material	Labor	Disposal	Material	Labor	Disposal			
30	1 B 96 C F 2 (MAG)	F82EHS	227	Replace	T 28 R F 4	F44SSILL	96	\$150.00	\$45.00	\$5.00							\$70.00	\$0.00	\$270.00
191	S 60 C F 2 (ELE) 8'	F82EE	123	NONE													\$0.00	\$0.00	\$0.00
192	S 60 C F 2 (ELE) 8' Egg Crate	F82EE	123	NONE													\$0.00	\$0.00	\$0.00
204	S 96 P F 2 (MAG) 8'	F82EHE	207	NONE													\$0.00	\$0.00	\$0.00
205	S 110 P F 2 (MAG) 8' T-12 Egg Crate	F82SHS	257	NONE													\$0.00	\$0.00	\$0.00
206	S 96 P F 2 (MAG) 8' T-8 (ONE PIN)	F82EHE	207	NONE													\$0.00	\$0.00	\$0.00
214	S 60 P F 2 8' T-12	F82EHS	227	NONE													\$0.00	\$0.00	\$0.00
225	E 110 P F 2 Mag	F82SHE	237	NONE													\$0.00	\$0.00	\$0.00

Energy Audit of Linden City - Municipal Garage
CHA Project No.29743
Fixture and Control Replacement Cost Lighting Analysis

Hours of Operation

Area	Hours/Day	Hours/Year	Proposed	Utilized
Garage	8	2080	2080	y
Offices	8	2080	1664	y
Restroom	8	2080	1664	y
Storage Areas	8	2080	1664	y

APPENDIX D

New Jersey Board of Public Utilities Incentives

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

I. SMART START



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NJ SmartStart Buildings

Program Overview

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EDA PROGRAMS

SBC CREDIT PROGRAM



With New Jersey SmartStart Buildings ...

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

Special Notice

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

Visit the Sandy web page for details and important links.

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

[Project Categories](#)

[Custom Measures](#)

[Incentives for Qualifying Equipment and Projects](#)

[Program Terms and Conditions](#)

[Find a Trade Ally](#)

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

Getting Started

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

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

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

Support for Custom Energy-Efficiency Measures

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

Incentives for Qualifying Equipment and Projects

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

Find out more about equipment incentives

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

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Equipment Incentives

Special Notice

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

Visit the Sandy web page for details and important links.

More reasons for a smart start on your next project!

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

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

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

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



Electric Chillers

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

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

Gas Cooling

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

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

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

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

Ground Source Heat Pumps

Closed Loop (\$450-750 per ton)

Gas Heating

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

Variable Frequency Drives

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

Natural Gas Water Heating

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

Premium Motors

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

Refrigerator/Freezer Case Premium Efficiency Motors (ECM)

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

Prescriptive Lighting

New Linear Fluorescent

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

New Induction (\$70 per replaced HID fixture)

New LED

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

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

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

Display case (\$30 per case)

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

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

Parking garage luminaires (\$100 per fixture)

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

Stairwell and Passageway luminaires (\$40 per fixture)

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

Bollard (\$50 per fixture)

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

Fuel pump canopy (\$100 per fixture)

LED retrofit kits (custom measures)

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

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

Induction Retrofit (\$50 per retrofitted HID fixture)

New Construction/Complete Renovation (performance-based)

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

Lighting Controls

Occupancy Sensors

Wall mounted (\$20 per control)

Remote mounted (\$35 per control)

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

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

HID or Fluorescent Hi-Bay Controls

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

Daylight dimming (\$45 per fixture controlled)

Refrigeration

Covers and Doors

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

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

Controls

Door Heater Control (\$50 per control)

Electric Defrost Control (\$50 per control)

Evaporator Fan Control (\$75 per control)

Novelty Cooler Shutoff (\$50 per control)

Food Service Equipment

Cooking

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

Holding

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

Cooling

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

Cleaning

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

Other Equipment Incentives*

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

Custom electric and gas equipment incentives (not prescriptive)

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

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II. DIRECT INSTALL



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SBC CREDIT PROGRAM

NEW JERSEY'S CLEAN ENERGY PROGRAM

DIRECT Install

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

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

ELIGIBILITY



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

SYSTEMS & EQUIPMENT ADDRESSED BY THE PROGRAM

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



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

III. PAY FOR PERFORMANCE (P4P)



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Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

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



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

Eligibility

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

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

ENERGY STAR Portfolio Manager

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



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

Incentives

**OIL, PROPANE & MUNICIPAL
ELECTRIC CUSTOMERS**

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

EDA PROGRAMS

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

SBC CREDIT PROGRAM

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

PAST PROGRAMS

TOOLS AND RESOURCES

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

PROGRAM UPDATES

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

CONTACT US

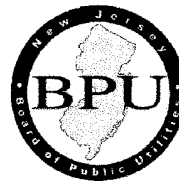


A detailed Incentive Structure document is available on the applications and form

Steps to Participation

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

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PAY FOR PERFORMANCE APPLICATION FORM

July 1, 2014 – June 30, 2015

Utility Serving Applicant:

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

Instructions

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

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

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

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

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

Partner Information

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

Project Information

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

Funding

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

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

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

Additional Project information

Additional Utility Account(s)

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

Additional Comments:

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

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

Phone: 866-657-6278 • Fax: 732-855-0422

E-mail: P4P@NJCleanEnergy.com

Visit our website: NJCleanEnergy.com/P4P

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*Incentives/Requirements subject to change.

001-FY15-07/14

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

ADMINISTRATOR – New Jersey Board of Public Utilities (NJBPU)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

POST-INSTALLATION APPROVAL – After the complete installation of all measures in the Energy Reduction Plan, the Customer and their Partner must finalize and submit the Incentive #2 Payment Submittal, consisting of the Installation Report, invoices, and Request for Incentive #2 Payment form. All components of the submittal package must be filled out completely, truthfully and accurately. Upon review of the submittal package and verification of the complete installation of all measures in the Energy Reduction Plan (via inspection by the Market Manager or agent thereof), 50% of the total 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

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

HOME

RESIDENTIAL

COMMERCIAL, INDUSTRIAL
AND LOCAL GOVERNMENT

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND
FUEL CELLSLOCAL GOVERNMENT ENERGY
AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT
PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL
ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

Home » Commercial & Industrial » Programs

Energy Savings Improvement Program

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

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

Local Government
School Districts (K-12)

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

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings
Procedures for Implementation

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

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

FIRST STEP – ENERGY AUDIT

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

ENERGY REDUCTION PLANS

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

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

ESIP PROGRAM

Final version 42413

BPU RULES

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

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

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

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

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

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

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

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

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

APPENDIX E

Photovoltaic Analysis

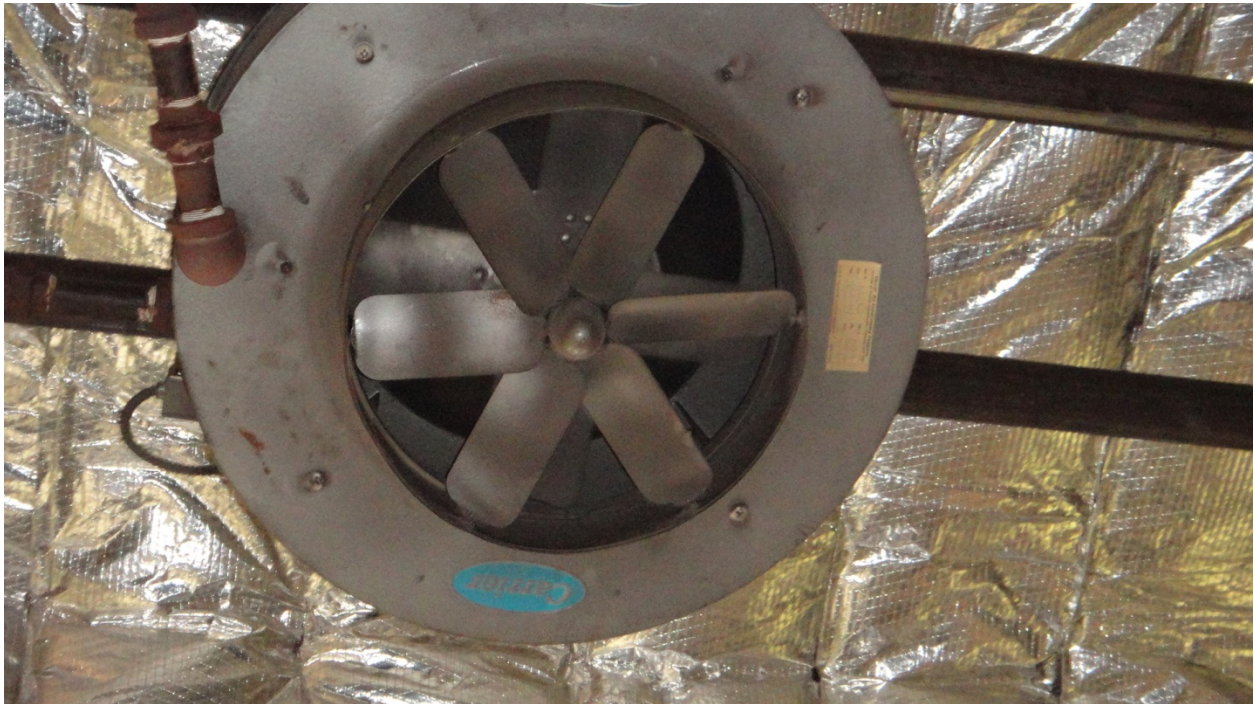
NOT APPLICABLE FOR THIS BUILDING

APPENDIX F

Photos



MUNICIPAL GARAGE



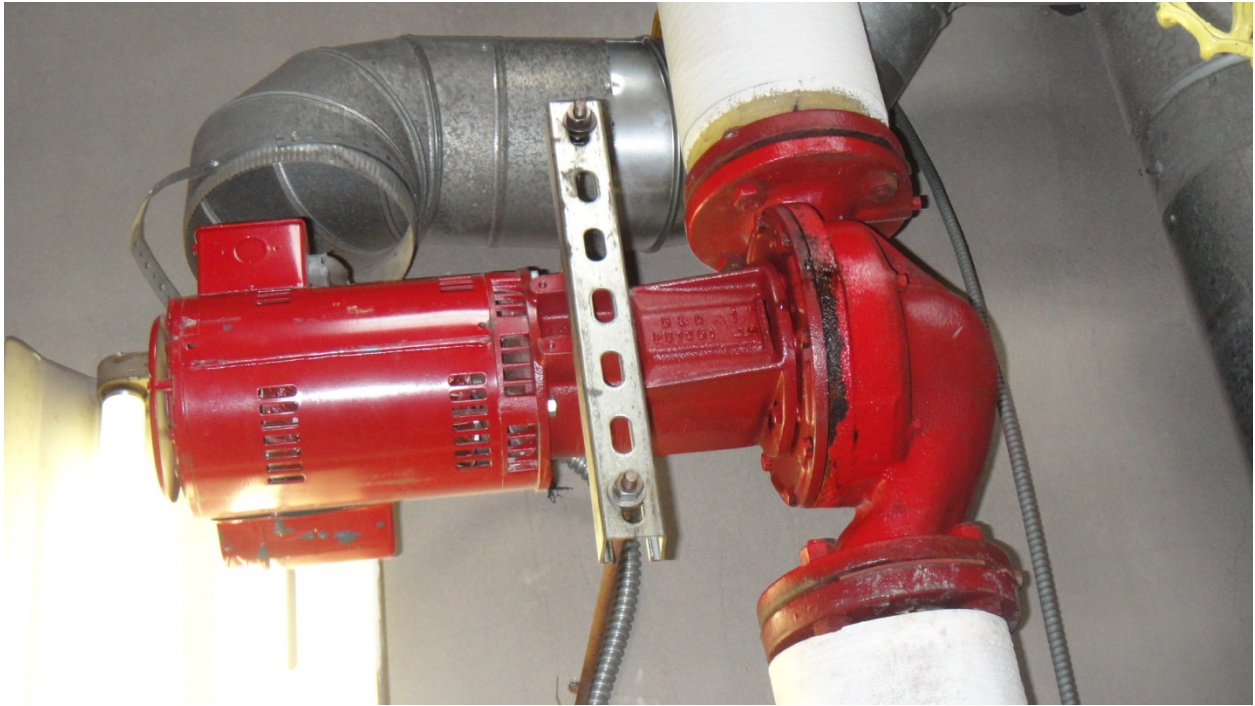
VERTICAL HOT WATER UNIT HEATER



HORIZONTAL HOT WATER UNIT HEATER



AIR COOLED CONDENSING UNIT SERVING OFFICES



HEATING HOT WATER CIRCULATING PUMP



BOILER BURNER NAMEPLATE



HOT WATER BOILER



DHW HEATER

APPENDIX G

EPA Benchmarking Report



ENERGY STAR[®] Statement of Energy Performance

N/A

Municipal Garage

Primary Property Function: Repair Services (Vehicle, Shoe, Locksmith, etc.)
Gross Floor Area (ft²): 14,000
Built: 1935

ENERGY STAR[®]
Score¹

For Year Ending: December 31, 2014
Date Generated: March 18, 2015

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

Property & Contact Information

Property Address

Municipal Garage
1901 Lower Road
Linden, New Jersey 07036

Property Owner

,
() -

Primary Contact

,
() -

Property ID: 4345658

Energy Consumption and Energy Use Intensity (EUI)

Site EUI

209.6 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,678,800 (91%)
Electric - Grid (kBtu)	255,477 (9%)

National Median Comparison

National Median Site EUI (kBtu/ft ²)	81.5
National Median Source EUI (kBtu/ft ²)	100.4
% Diff from National Median Source EUI	157%

Source EUI

258.2 kBtu/ft²

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO ₂ e/year)	176
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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)**