BOROUGH OF GLEN ROCK

Ambulance Squad

1 Harding Plaza Glen Rock NJ, 07452

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

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CHA PROJECT NO. 30655

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REPORT DISCLAIMER

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

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

List of Common Energy Audit Abbreviations

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

1.0 EXECUTIVE SUMMARY

This report summarizes the energy audit performed by CHA for Glen Rock Ambulance Squad facility 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
Ambulance Squad	1 Harding Plaza, Glen Rock, NJ 07452	2,328	1970s

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)
Ambulance Squad	8,332	464	$2,992	13.6

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

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

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

Summary of Energy Conservation Measures

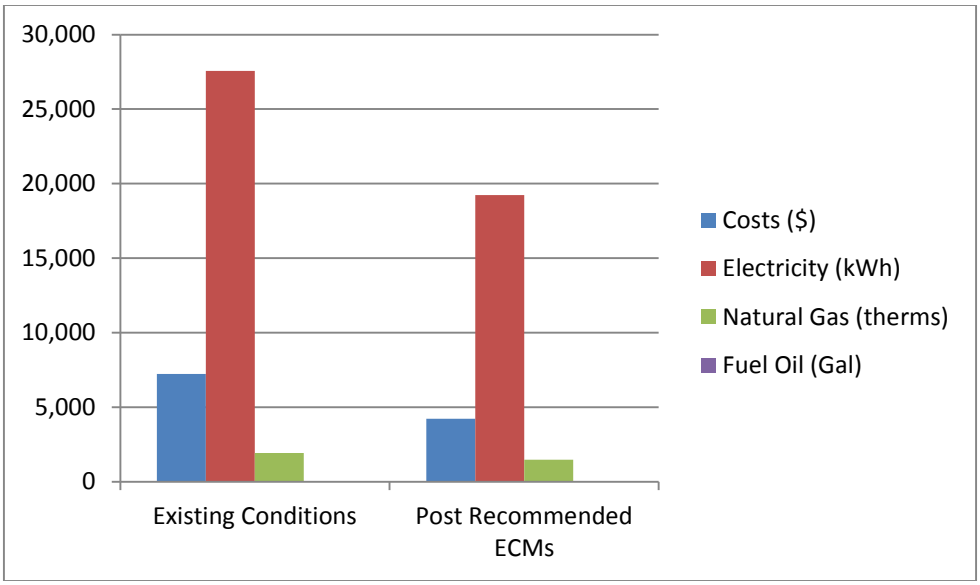
ECM #	Energy Conservation Measure	Est. Costs ($)	Est. Savings ($/year)	Payback w/o Incentive	Potential Incentive ($)*	Payback w/ Incentive	Recommended
1	Replace A/C units with high efficiency units	5,900	545	10.8	230	10.4	Y
2	Replace tank DHW heater condensing DHW	8,511	126	67.6	50	67.2	Y
3	Install pipe insulation	844	138	6.1	0	6.1	Y
4	Replace high flow fixtures with low flow fixtures	6,780	888	7.6	0	7.6	Y
L1	Lighting Replacements / Upgrades	20,422	1,295	15.8	1,590	14.5	Y
	Total**	**42,458**	**2,992**	**14**	**1,870**	**14**	
	Total(Recommended)	42,458	2,992	14	1,870	14	

* 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.

Due to the fact that this building has a pitched roof with minimal available space and there is significant shading from trees, it was not recommended that a solar PV system be installed at this site.

If the Borough of Glen Rock implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	**Post Recommended ECMs**	**Percent Savings**
Costs ($)	7,219	4,227	41%
Electricity (kWh)	27,564	19,232	30%
Natural Gas (therms)	1,929	1,465	24%
Greenhouse Gas Reduction (MT CO2)	22	16	27%
Site EUI (kbtu/SF/Yr)	123.3	91.1	


30,000
25,000
20,000
15,000
10,000
5,000
0
Existing Conditions
Post Recommended ECMs
Costs ($)
Electricity (kWh)
Natural Gas (therms)
Fuel Oil (Gal)

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

Building Name: Ambulance Squad
Address: 1 Harding Plaza, Glen Rock, NJ 07452
Gross Floor Area: 2,328 sq. ft.
Number of Floors: One Floor plus attic storage area
Year Built: 1970s

General

Description of Spaces: The building is used as an emergency services building for the Glen Rock Ambulance Squad. It has offices, storage rooms, restrooms and four garage bays.
Description of Occupancy: The facility has 10 part-time employees.
Number of Computers: The building has approximately 5 desktop and laptop computers.
Building Usage: The Ambulance Squad is part time, so the building has the potential to be occupied 24/7 year round, but is typically only occupied during emergency events.
Construction: The building is constructed of concrete masonry blocks with steel framing and brick exterior fascia. The interior spaces have stud framed walls with an estimated 4" of insulation and sheetrock. The walls are in good condition.
Roof: This facility has a pitched roof constructed of wooden trusses, plywood decking and asphalt shingles. Approximately 6" of fiberglass batt insulation is installed under the floor of the attic. The roofing system and insulation are in good condition.

Windows: The building has double pane windows with vinyl frames. These windows are in good condition.
Exterior Doors: The garage has two insulated composite roll up doors and one insulated steel entrance door with a double pane window. The main entrance door is an insulated steel door with small double pane windows. The doors and their seals and sweeps all appear to be in good condition.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating & Cooling: Heating for this building is provided by a fairly new Lochinvar Knight condensing hot water boiler. This boiler operates at an efficiency of 95% based on the manufacturer's specifications. There is one fractional horsepower boiler primary pump and three (3) additional fractional horsepower zone pumps that circulate hot water from the boiler to terminal devices in the spaces including hot water unit heaters in the garage bays and a main hot water heating coil in the air handling unit located in the attic.

The majority of the building is heated, ventilated and air conditioned by a Carrier air handling unit (AHU) installed in the attic. This AHU has a heating hot water coil served by the boiler described above as well as a direct expansion (DX) cooling coil served by a remote mounted condensing unit. The unit serves a constant volume ducted distribution system. This unit was manufactured in 2013 and is in good condition.

Ventilation: Ventilation is provided by the AHU described above. There is no ECM associated with the ventilation system.

Exhaust: This building has (2) paddle style exhaust fans installed through the roof, accessible from the attic and controlled by wall mounted switches. The fans are in good condition and no ECM has been evaluated for the exhaust fans.

Controls Systems

Space temperature control is achieved using several space mounted programmable thermostats. These thermostats are 7-day programmable. All of the thermostats observed were set at unoccupied temperatures and are scheduled at 65°F heating and 78°F cooling at all times until the building is occupied. When occupants arrive they adjust the temperature to their desired temperatures. These thermostats are in good condition and are programmed well. No ECM has been evaluated with relation to modifying the HVAC control system.

Domestic Hot Water Systems

Domestic hot water for the entire building is provided by a Bradford White natural gas fired water heater installed next to the heating hot water boiler in the ground floor boiler room. This water heater operates at an efficiency of 80% per the manufacturers specifications. The water heater is new and in good condition, however there was no piping insulation installed on the hot water piping and it is not efficient by today's standards. An ECM has been evaluated to replace this water heater with a condensing tank type water heater, as well as a measure to install piping insulation.

Kitchen Equipment

The kitchen equipment in this building includes one residential style combination range/stove which is natural gas fired and is in good condition. In addition, the kitchen is not used very heavily. All remaining residential style kitchen appliances appear to be fairly new and are assumed to have been installed during a recent renovation of a portion of the building. No ECM was considered for replacing this equipment.

Plug Load

This building has a minimal amount of residential style appliances, mostly located in the kitchen, that contribute to the plug load in the building. We have calculated the plug load to have minimal impact compared to other electric consuming devices. A recommendation has been included in the O&M section to purchase Energy Star rated equipment when the old ones need replacement.

Plumbing Systems

There are two restrooms in this facility that have recently been renovated to include new low-water consuming plumbing fixtures. One additional restroom on the ground floor adjacent to the boiler room has one original toilet using 3.5 gallons per flush and one original sink using 2.5 gallons per minute. An ECM has been evaluated related to replacement of these original plumbing fixtures with low-water consuming equivalents.

Lighting Systems

The lighting in the garages consists of 4' linear fluorescent fixtures using 54 watt T-5 high output lamps. The remaining lighting in the other areas of the building is a mixture of 4' linear fluorescent fixtures using 32 watt T-8 lamps, as well as incandescent and compact fluorescent fixtures of various wattages. All of the lighting in the building is manually controlled by wall mounted switches. The exterior lighting consists of various wattage metal halide wall pack fixtures. LED lights are recommended in this study. We have provided three alternatives for the observed lighting that include adding occupancy sensors to the existing lights, replacing the lights with LED lights and a third ECM that evaluates adding occupancy sensors to the proposed LED lights.

3.0 UTILITIES

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

	Electric	Natural Gas
Deliverer	PSE&G	PSE&G
Supplier	PSE&G	PSE&G

For the 12-month period reported in the LGEA program application, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	27,564	kWh
Annual Cost	5,066	$
Blended Unit Rate	0.184	$/kWh
Peak Demand	10.9	kW
Natural Gas		
Annual Consumption	1,929	Therms
Annual Cost	2,152.70	$
Unit Rate	1.115	$/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)

See Appendix A for utility analysis summary tables.

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	$0.184	$0.13	Y
Natural Gas	$/Therm	$1.115	$0.96	Y

* Per U.S. Energy Information Administration (2015 data – Electricity and Natural Gas, 2015 data – Fuel Oil)

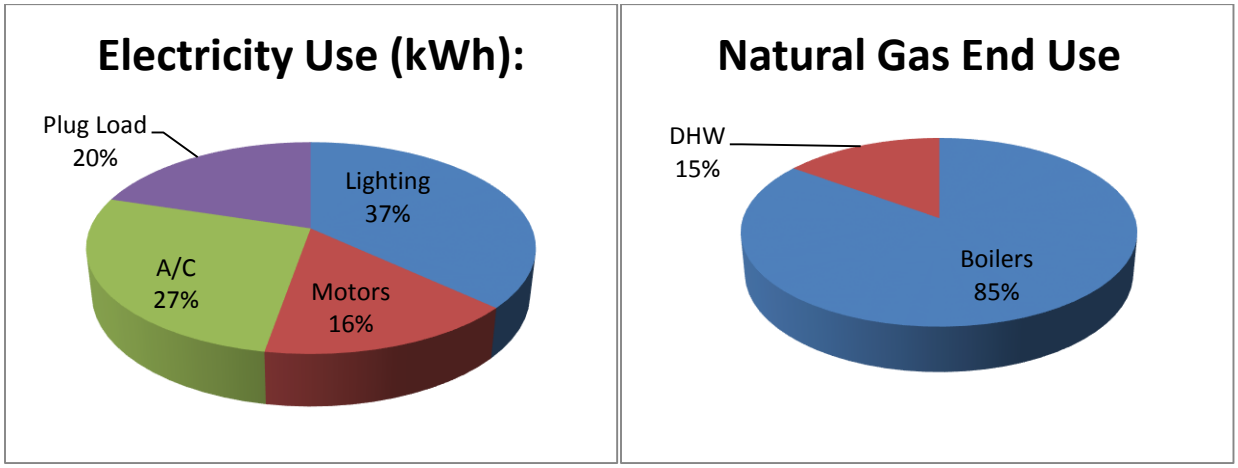
Additional information on selecting a third party energy supplier is available here:

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

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

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

Site End-Use Utility Profile



4.0 BENCHMARKING

The EPA Portfolio Manager benchmarking tool provides a site and source Energy Use Intensity (EUI), as well as an Energy Star performance rating for qualifying building types. The EUIs are provided in kBtu/ft^2/year, and the performance rating represents how energy efficient a building is on a scale of 1 to 100, with 100 being the most efficient. In order for a building to receive and Energy Star label, the energy benchmark rating must be at least 75. As energy use decreases from implementation of the proposed measures, the Energy Star rating will increase. 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)
101.3	144.9	NA

The building's Energy Star score is not available as the data used to generate the account was not complete. The score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide. A score of 50 represents median energy performance and a score of 75 or higher indicates that the building is a top performer. The site EUI of the building is 101.3 and source EUI is 144.9. The building has higher EUIs than the national median EUIs (national median site EUI is 86.1 kBtu/ft^2 and national median source EUI is 123.1 kBtu/ft^2). The EUI of this building is (+)18% higher than national median. The EUI could be reduced after implementing some of the proposed energy conservation measures.

5.0 ENERGY CONSERVATION MEASURES

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

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

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

Energy savings were quantified in the form of:

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

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

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

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

5.1 ECM-1: Replace A/C unit with high efficiency unit

The building has one old air cooled condensing unit serving a fan coil that cools the garage area. This unit was manufactured in 1994 and has reached the end of its useful life. In addition, the unit is operating at an efficiency of 8 EER. It is proposed to replace this unit with a high efficiency unit of the same capacity that will operate at an efficiency of 20 EER. Electrical energy savings will result from improved cooling system efficiency.

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

ECM-1 Replace A/C unit with high efficiency unit

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
5,900	1.5	2,545	0	545	0.4	230	10.8	10.4

* 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: Replace DHW heater with Condensing DHW heater

The existing domestic hot water heater is a standard efficiency water heater. Although this unit is fairly new, it only operates at a rated efficiency of 80% per the manufacturer. It is recommended to replace this water heater with a condensing type water heater of the same capacity that will operate at an efficiency of 96% or higher. Natural gas savings will result from improved water heating system efficiency.

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

ECM-2 Replace DHW heater with Condensing DHW heater

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
8,511	0	0	113	126	(0.9)	50	67.6	67.2

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

Although the payback is long, this measure is recommended as it will fit in a total building project with a favorable payback.

5.3 ECM-3: Install Pipe Insulation

The boiler room contains both a fairly new DHW heater and boiler. It was noted during the site visit that when these systems were installed, none of the hot water piping in the boiler room was insulated. It is recommended to install piping insulation on all of the hot water piping in this room as well as any other piping found to be un-insulated. Natural gas savings will result from reduced heat transfer and reduced heating loads of the water heater and boiler systems.

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

ECM-3 Install Pipe Insulation

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
844	0	0	123	138	1.4	0	6.1	6.1

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

This measure is recommended.

5.4 ECM-4: Install low-flow plumbing fixtures

There are two restrooms in this facility that have sinks, urinals and toilets are all high water consuming fixtures. The sinks use 2.5 gallons per minute, and the urinals and toilets use 3.5 gallons per flush. It is recommended to replace these plumbing fixtures with low-water consuming equivalents. The new toilets will use 1.28 gallons per flush, urinals will use 0.125 gallons per flush and the sinks will use 0.5 gallons per minute. Water savings will result from more efficient plumbing fixtures.

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

ECM-4 Install Low-Flow Plumbing Fixtures

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Water	Natural Gas	Total				
$	kW	kWh	kGal	Therms	$		$	Years	Years
6,780	0	0	115	228	888	1.0	0	7.6	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.

5.5.1 ECM-L1 Lighting Replacement / Upgrades

The building has a mixture of T-8 fluorescent, incandescent and CFL lighting fixtures. Exterior lights are various wattage metal halide fixtures. The majority of these lights are controlled by occupancy sensors, therefore there are minimal potential savings for improving lighting control.

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

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

ECM-L1 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
20,422	4.5	5,787	0	1,295	0	1,590	15.8	14.5

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

This measure is recommended.

5.6 Additional O&M Opportunities

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

- Replace door seals and sweeps.
- Purchase Energy Star labeled appliances when replacement is needed..
- Install an insulation blanket on the domestic hot water heater

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.

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.

6.1.2 Direct Install Program

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

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

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

The program pays a maximum amount of $75,000 per building, and up to $250,000 per customer per year. Installations must be completed by an approved Direct Install participating contractor, a list of which can be found on the New Jersey Clean Energy

Website. Contractors will coordinate with the applicant to arrange installation of recommended measures identified in a previous energy assessment, such as this energy audit. The incentive is reimbursed to the Owner upon successful replacement and payment of the equipment.

The Ambulance Facility qualifies for the direct install program since the peak electric demand in the evaluated 12 month period was below 200 KW.

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.

<u>Electric</u>

- 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.

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.

6.1.5 Renewable Energy Incentive Program

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

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

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

7.0 ALTERNATIVE ENERGY SCREENING EVALUATION

7.1 Solar

7.1.1 Photovoltaic Rooftop Solar Power Generation

The building was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The amount of available roof area determines how large of a solar array can be installed on any given roof. Due to the pitched roof there is no available space at this facility to install a solar PV system at this site. This renewable energy measure was not evaluated.

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey Solar Renewable Energy Certificates Program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. Payments that will be received by the PV producer will change from year to year dependent upon supply and demand. There is no definitive way to calculate an exact price that will be received by the PV producer for SREC credits over the next 15 years. Renewable Energy Consultants estimates an average of $200/SREC for 2015 and this number was utilized in the cash flow for this report.

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

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.

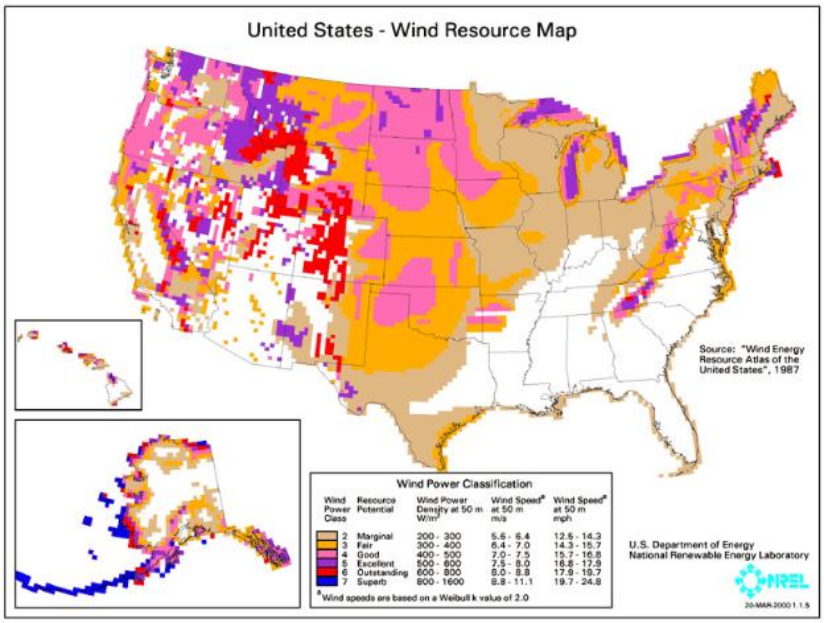
A standard solar hot water system is typically composed of solar collectors, heat storage vessel, piping, circulators, and controls. Systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. The solar collectors are usually 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, Glen Rock, 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 large enough year-round thermal loads which are needed for efficiency CHP operation.

7.4 Demand Response Curtailment

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

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

A pre-approved CSP will require a minimum of 100 kW of load reduction to participate in any curtailment program. From the information provided in the program application, the facility peak demand is only 10.9 kW which does not meet the requirement of the program.

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 Borough of Glen Rock Ambulance Squad Facility.

The following projects should be considered for implementation:

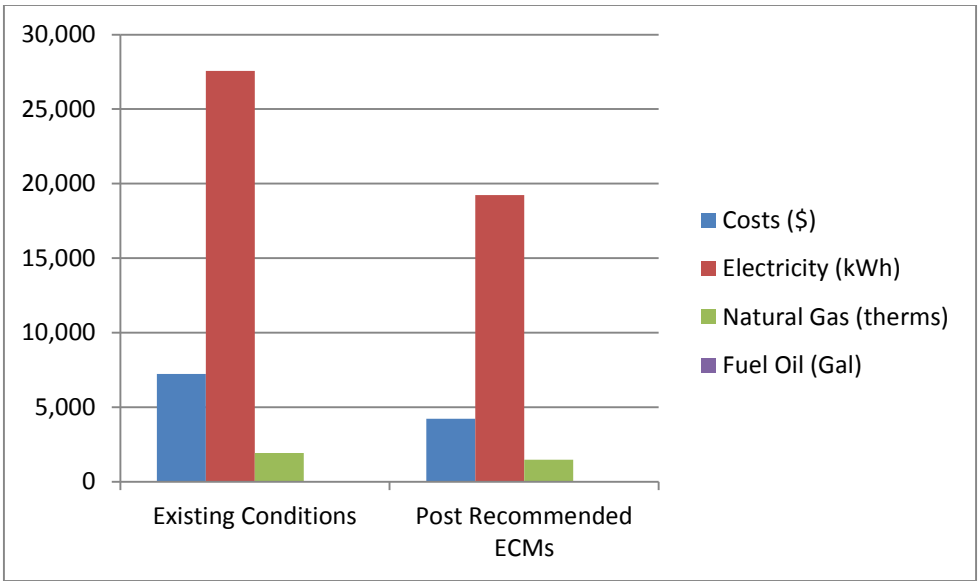
- Replace A/C unit with high efficiency unit
- Replace DHW heater with Condensing DHW heater
- Install pipe insulation
- Install Low-Flow Plumbing Fixtures
- Lighting Replacements

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)
8,332	464	2,992	13.6

If the Borough of Glen Rock implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	7,219	4,227	41%
Electricity (kWh)	27,564	19,232	30%
Natural Gas (therms)	1,929	1,465	24%
Greenhouse Gas Reduction (MT CO2)	22	16	27%
Site EUI (kbtu/SF/Yr)	123.3	91.1	



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

APPENDIX A

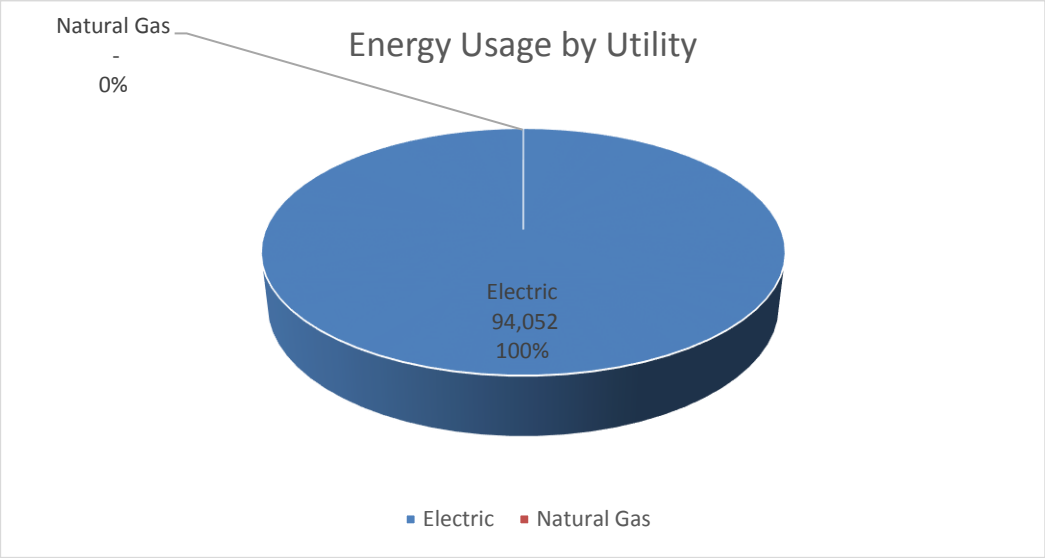
Utility Usage Analysis and Alternate Utility Suppliers

Local Government Energy Audit
Borough of Glen Rock
Ambulance Squad

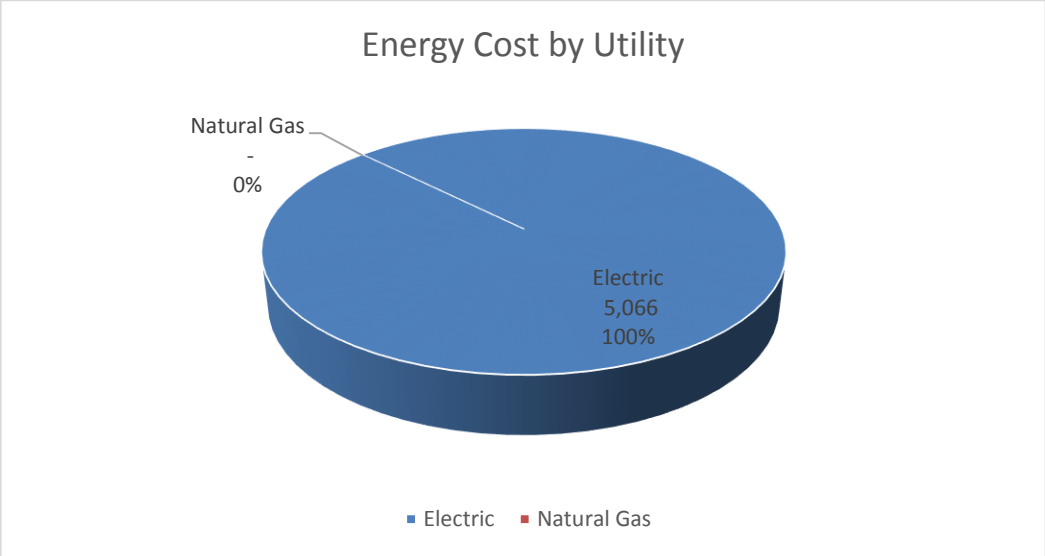
Annual Utilities
12-month Summary

Electric		
Annual Usage	27,564	kWh/yr
Annual Cost	5,066	$
Blended Rate	0.184	$/kWh
Consumption Rate	0.167	$/kWh
Demand Rate	4.29	$/kW
Peak Demand	10.9	kW
Min. Demand	6.9	kW
Avg. Demand	8.9	kW
Natural Gas		
Annual Usage	0	Therms/yr
Annual Cost	0	$
Blended Rate	#DIV/0!	$/therm
Consumption Rate	#DIV/0!	$/therm
Demand Rate	#DIV/0!	$/therm
Energy Summary		
Building Area	64,000	SF
Energy Usage Intensity (EUI)	1	KBtu/SF/yr
Energy Cost Index (ECI)	0.08	$/SF/yr
Total Annual Utility Costs	5,066	$

Utility	KBtu	%
Electric	94,052	100%
Natural Gas	-	0%
	94,052	100%



Utility	$	%
Electric	5,066	100%
Natural Gas	-	0%
	5,066	100%



Local Government Energy Audit
Borough of Glen Rock

Electric Service

For Service at: Ambulance Squad
Account No.: 65 464 420 00
Meter No.: 778014360

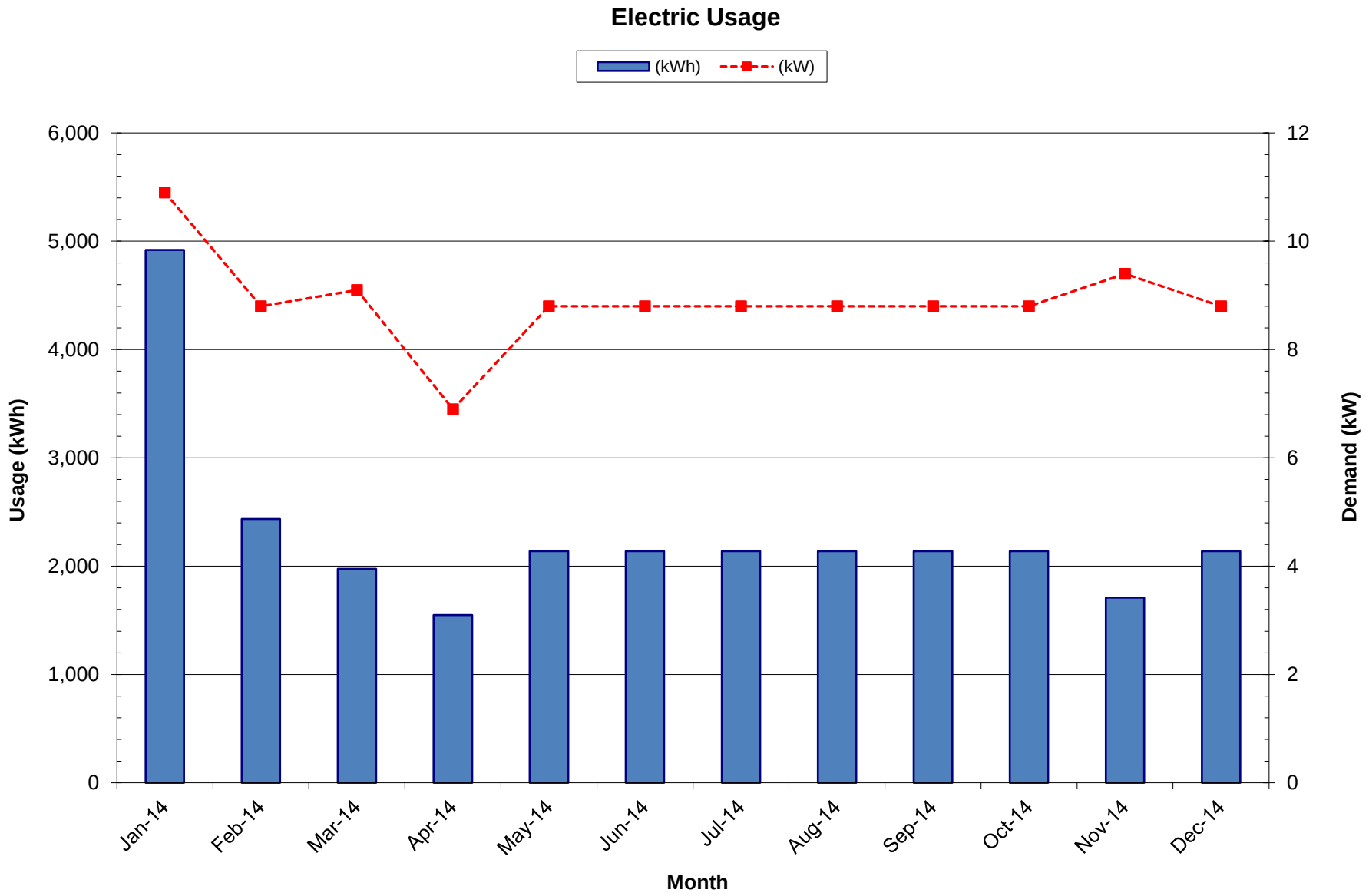
Delivery: PSE&G
Supply: PSE&G

	Consumption		Demand		Provider Charges			Unit Costs				
Month	(kWh)	($)	(kW)	($)	Delivery ($)	Supplier ($)	Total ($)	Demand ($/kW)	Consumption ($/kWh)	Delivery ($/kWh)	Supplier ($/kWh)	Blended Rate ($/kWh)
January-14	4,920	$611.26	10.9	46.7	214.9	443.0	657.92	4.281	0.124	0.044	0.090	0.134
February-14	2,436	$363.94	8.8	37.7	120.8	280.8	401.61	4.281	0.149	0.050	0.115	0.165
March-14	1,974	$330.71	9.1	39.0	107.1	262.6	369.66	4.280	0.168	0.054	0.133	0.187
April-14	1,548	$288.59	6.9	29.5	83.9	234.2	318.13	4.281	0.186	0.054	0.151	0.206
May-14	2,139	$391.24	8.8	37.7	128.67	300.24	428.91	4.281	0.183	0.060	0.140	0.200
June-14	2,139	$391.24	8.8	37.7	128.67	300.24	428.91	4.281	0.183	0.060	0.140	0.200
July-14	2,139	$391.24	8.8	37.7	128.67	300.24	428.91	4.281	0.183	0.060	0.140	0.200
August-14	2,139	$391.24	8.8	37.7	128.67	300.24	428.91	4.281	0.183	0.060	0.140	0.200
September-14	2,139	$391.24	8.8	37.7	128.67	300.24	428.91	4.281	0.183	0.060	0.140	0.200
October-14	2,139	$391.24	8.8	37.7	128.67	300.24	428.91	4.281	0.183	0.060	0.140	0.200
November-14	1,710	$275.43	9.4	40.8	96.9	219.3	316.19	4.336	0.161	0.057	0.128	0.185
December-14	2,139	$391.24	8.8	37.7	128.67	300.24	428.91	4.281	0.183	0.060	0.140	0.200
Total (12 months)	**27,564**	**$4,608.62**	**10.9**	**457.27**	**$1,524.32**	**$3,541.57**	**$5,065.89**	**$4.286**	**$0.167**	**$0.055**	**$0.128**	**$0.184**
Notes	1A	1B	2A	2B	3	4	5	6	7	8	9	9

1A.) Number of kWh of electric energy used per month
1B.) Consumption charges ($)
2A.) Number of kW of power measured
2B.) Demand charges ($)
3.) Electric charges from Delivery provider
4.) Electric charges from Supply provider - note, includes 8.875% tax
5.) Total charges (Delivery + Supplier)
6.) Demand charges ($) / Demand (kW)
7.) Consumption charges ($) / Consumption (kWh)
8.) Delivery Charges ($) / Consumption (kWh)
9.) Supplier Charges ($) / Consumption (kWh)
10.) Total Charges ($) / Consumption (kWh)

Estimated Values

#REF! of blended rate (fixed portion of the bill that can't be negotiated)
#REF! of blended rate (portion of the bill that can be negotiated)


Electric Usage
(kWh)
(kW)
6,000
5,000
4,000
3,000
2,000
1,000
0
12
10
8
6
4
2
0
Usage (kWh)
Demand (kW)
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Month

PSE&G GAS SERVICE TERRITORY
Last Updated 7/21/15

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

Supplier	Telephone & Web Site	*Customer Class
Agera Energy, LLC **115 route 46, Building F** **Parsippany, NJ 07054**	**(844) 692-4372** **www.ageraenergy.com**	**R/C/I**
Ambit Northeast, LLC d/b/a Ambit Energy 103 Carnegie Center Suite 300 Princeton, NJ 08540	877-282-6284 www.ambitenergy.com	**R/C** **ACTIVE**
American Power & Gas of NJ, LLC 10000 Lincoln Drive East – Suite 201 Marlton, NJ 08053	(800) 2057491 www.GoAPG.com	**R/C/I**
Amerigreen Energy, Inc. 333 Sylvan Avenue Suite 305 Englewood Cliffs, NJ 07632	(888)559-4567 www.amerigreen.com	**C/I** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	888-850-1872 www.AstralEnergyLLC.com	**R/C/I** **ACTIVE**
BBPC, LLC Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	888-651-4121 www.greateasternenergy.com	**C** **ACTIVE**
Choice Energy, LLC **4257 US Highway 9, Suite 6C** **Freehold, NJ 07728**	(888) 565-4490 www.4choiceenergy.com	**R/C/I**
Clearview Electric Inc. d/b/a Clearview Gas 1744 Lexington Ave. Pennsauken, NJ 08110	800-746-4720 www.clearviewenergy.com	**R/C** **ACTIVE**

Colonial Energy, Inc. 83 Harding Road Wyckoff, NJ 07481	845-429-3229 www.colonialgroupinc.com	**C/I** **ACTIVE**
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07746	888 817-8572 www.commerceenergy.com	**R** **ACTIVE**
Compass Energy Services, Inc. 33 Wood Avenue South, 610 Iselin, NJ 08830	866-867-8328 www.compassenergy.net	**C/I** **ACTIVE**
Compass Energy Gas Services, LLC 33 Wood Avenue South Suite 610 Iselin, NJ 08830	866-867-8328 www.compassenergy.net	**C/I** **ACTIVE**
ConocoPhillips Company 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-646-4427 www.conocophillips.com	**C/I** **ACTIVE**
Consolidated Edison Energy, Inc. **d/b/a Con Edison Solutions** 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-686-1383 x2130 www.conedenergy.com	
Consolidated Edison Solutions, Inc. Cherry Tree Corporate Center 535 State Highway 38, Suite 140 Cherry Hill, NJ 08002	888-665-0955 www.conedsolutions.com	**C/I** **ACTIVE**
Constellation NewEnergy-Gas Division, LLC 116 Village Boulevard, Suite 200 Princeton, NJ 08540	800-785-4373 www.constellation.com	**C/I** **ACTIVE**
Constellation Energy Gas Choice, Inc. 116 Village Blvd., Suite 200 Princeton, NJ 08540	800-785-4373 www.constellation.com	**R/C/I** **ACTIVE**
Constellation Energy Services Natural Gas, LLC **116 Village Boulevard**	1 (800) 536-0151	**C/I**

Suite 200 **Princeton, NJ 08540**	www.integrysenergy.com	
Direct Energy Business, LLC 1 Hess Plaza Woodbridge, NJ 07095	888-925-9115 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Direct Energy Business Marketing, LLC (fka Hess Energy Marketing) One Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Direct Energy Small Business, LLC (fka Hess Small Business Services, LLC) One Hess Plaza Woodbridge, NJ 07095	(888) 925-9115 http://www.business.directenergy.com/small-business	**C/I** **ACTIVE**
Direct Energy Services, LLC **1 Hess Plaza** **Woodbridge, NJ 07095**	1 (866) 348-4193 www.directenergy.com	**C/I** **INACTIVE**
Dominion Retail, Inc. d/b/a Dominion Energy Solutions **395 Route #70 West, Suite 125 Lakewood, NJ 08701**	(866)237-4765 www.dominionenergy.com	**R/C**
Everyday Energy, LLC **One International Blvd., Suite 400** **Mahwah, NJ 07495-0400**	844-684-5506 www.energyrewards.comcast.com	**R/I**
Frontier Utilities Northeast, LLC 199 New Road, Suite 61-187 Linwood, NJ 08221	(877) 437-6930 www.frontierutilities.com	**R/C/I**
Glacial Energy of New Jersey, Inc. 21 Pine Street, Suite 237 Rockaway, NJ 07866	888-452-2425 www.glacialenergy.com	**C/I** **ACTIVE**
Gateway Energy Services Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 805-8586 www.gesc.com	**R/C** **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 2608 25th Road Astoria, NY 11102	(888) 453-4427 www.greenlightenergy.us	**R** **ACTIVE**
Harborside Energy LLC 101 Hudson Street, Suite 2100 Jersey City, NJ 07302	877-940-3835 www.harborsideenergynj.com	**R/C** **ACTIVE**
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	888 264-4908 www.hikoenergy.com	**R/C/I** **ACTIVE**
Hudson Energy Services, LLC 7 Cedar Street Ramsey, NJ 07466	877- Hudson 9 www.hudsonenergyservices.com	**C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	877-887-6866 www.idtenergy.com	**R/C** **ACTIVE**
Infinite Energy dba Intelligent Energy 1200 Route 22 East Suite 2000 Bridgewater, NJ 08807-2943	(800) 927-9794 www.InfiniteEnergy.com	**R/C/I** **ACTIVE**
Integrys Energy Services-Natural Gas, LLC 101 Eisenhower Parkway Suite 300 Roseland, NJ 07068	(800) 536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Jsynergy LLC 445 Cental Ave. Suite 204 Cedarhurst, NY 11516	(516) 331-2020 www.Jsnergyllc.com	**R/C/I** **ACTIVE**
Major Energy Services, LLC 1001 East Lawn Drive Teaneck NJ 07666	888-625-6760 www.majorenergy.com	**R/C/I** **ACTIVE**

Marathon Power LLC 302 Main Street Paterson, NJ 07505	888-779-7255 www.mecny.com	**R/C/I** **ACTIVE**
Metromedia Energy, Inc. 6 Industrial Way Eatontown, NJ 07724	1-877-750-7046 www.metromediaenergy.com	**C/I** **ACTIVE**
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	888-53-Metro www.metroenergy.com	**R/C** **ACTIVE**
MPower Energy NJ LLC One University Plaza, Suite 507 Hackensack, NJ 07601	877-286-7693 www.mpowerenergy.com	**R/C/I** **ACTIVE**
NATGASCO (Supreme Energy, Inc.) 532 Freeman Street Orange, NJ 07050	800-840-4427 www.supremeenergyinc.com	**R/C/I** **ACTIVE**
New Energy Services LLC 101 Neptune Avenue Deal, New Jersey 07723	800-660-3643 www.newenergyservicesllc.com	**R/C/I** **ACTIVE**
New Jersey Gas & Electric 10 North Park Place Suite 420 Morristown, NJ 07960	866-568-0290 www.njgande.com	**R/C** **ACTIVE**
Noble Americas Energy Solutions The Mac-Cali Building 581 Main Street, 8th fl. Woodbridge, NJ 07095	877-273-6772 www.noblesolutions.com	**C/I** **ACTIVE**
North American Power & Gas, LLC d/b/a North American Power 197 Route 18 South Ste. 300 New Brunswick, NJ 08816	888- 313-8086 www.napower.com	**R/C/I** **ACTIVE**
North Eastern States, Inc. d/b/a Entrust Energy 90 Washington Valley Road Bedminster, NJ 07921	(888) 521-5861 www.entrustenergy.com	**R/C/I** **ACTIVE**
Oasis Power, LLC d/b/a Oasis Energy 11152 Westheimer, Suite 901 Houston, TX 77042	(800)324-3046 www.oasisenergy.com	**R/C** **ACTIVE**

Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	855-32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**
PPL EnergyPlus, LLC **Shrewsbury Executive Offices** 788 Shrewsbury Avenue Suite 2200 Tinton Falls, NJ 07724	(732) 741-0505 www.pplenergyplus.com	**C/I** **ACTIVE**
Public Power & Utility of New Jersey, LLC One International Blvd, Suite 400 Mahwah, NJ 07495	(888) 354-4415 www.ppandu.com	**R/C/I** **ACTIVE**
Residents Energy, LLC 550 Broad Street Newark, NJ 07102	(888) 828-7374 www.residentsenergy.com	**R/C**
Respond Power LLC 1001 East Lawn Drive Teaneck, NJ 07666	(877) 973-7763 www.respondpower.com	**R/C/I** **ACTIVE**
Save on Energy, LLC 1101 Red Ventures Drive Fort Mill, SC 29707	1 (877) 658-3183 www.saveonenergy.com	**R/C** **ACTIVE**
SFE Energy One Gateway Center Suite 2600 Newark, NJ 07012	1 (877) 316-6344 www.sfeenergy.com	**R/C/I** **ACTIVE**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	(800) 695-0666 www.sjnaturalgas.com	**C** **ACTIVE**
Star Energy Partners, LLC **CEO Corporate Center** **1812 Front Street** **Scotch Plains, NJ 07076**	(855427-7827 www.starenergypartners.com	**R/C/I**
South Jersey Energy Company 1 South Jersey Plaza, Route 54	800-266-6020 www.southjerseyenergy.com	**R/C/I** **ACTIVE**

Folsom, NJ 08037		
SouthStar Energy d/b/a New Jersey Energy 1085 Morris Avenue, Suite 155 Union, NJ 07083	(866) 477-8823 www.newjerseyenergy.com	**R/C** **ACTIVE**
Spark Energy Gas, LP/ Spark Energy 2105 City West Blvd. Suite 100 Houston, TX 77042	(713)600-2600 www.sparkenergy.com	**R/C/I** **ACTIVE**
Sperian Energy Corp. Bridgewater Center 1200 Route 22 East Bridgewater, NJ 08807	888-682-8082 www.sperianenergy.com	**R/C/I** **ACTIVE**
Sprague Energy Corp. 12 Ridge Road Chatham Township, NJ 07928	855-466-2842 www.spragueenergy.com	**C/I** **ACTIVE**
Stuyvesant Energy LLC 10 West Ivy Lane, Suite 4 Englewood, NJ 07631	800-640-6457 www.stuyfuel.com	**C** **ACTIVE**
Stream Energy New Jersey, LLC 309 Fellowship Road Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	**R/C** **ACTIVE**
Summit Energy Services, Inc. 10350 Ormsby Park Place Suite 400 Louisville, KY 40223	1 (800) 90-SUMMIT www.summitenergy.com	**C/I** **ACTIVE**
Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	877-797-8786 www.systrumenergy.com	**R/C/I** **ACTIVE**
Talen Energy Marketing, LLC **788 Shrewsbury Avenue, Suite 2178** **Tinton Falls, NJ 07724**	(888) 289-7693 www.pplenergyplus.com/*	**R/C**
Tiger Natural Gas, Inc. dba Tiger, Inc. 234 20th Avenue Brick, NJ 008724	888-875-6122 www.tigernaturalgas.com	**R/C/I** **ACTIVE**

UGI Energy Services, Inc. dba UGI Energy Link 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	800-427-8545 www.ugienergylink.com	**C/I** **ACTIVE**
UGI Energy Services, Inc. d/b/a GASMARK 224 Strawbridge Drive, Suite 107 Moorestown, NJ 08057	856-273-9995 www.ugienergylink.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 2001 Route 46 Waterview Plaza, Suite 301 Parsippany, NJ 07054	800-388-3862 www.lowcostpower.com	**R/C** **ACTIVE**
Viridian Energy PA LLC 2001 Route 46, Waterview Plaza Suite 230 Parsippany, NJ 07054	866-663-2508 www.viridian.com	**R/C** **ACTIVE**
Vista Energy Marketing, L.P. 197 State Route 18 South, Suite 3000 South Wing East Brunswick, NJ 08816	888-508-4782 www.vistaenergymarketing.com	**R/C/I** **ACTIVE**
Woodruff Energy 73 Water Street PO Box 777 Bridgeton, NJ 08302	800-557-1121 www.woodruffenergy.com	**R/C/I** **ACTIVE**
Woodruff Energy US LLC 73 Water Street P.O. Box 777 Bridgeton, NJ 08302	800-457-1121 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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PSE&G ELECTRIC SERVICE TERRITORY
Last Updated: 7/21/15

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

Supplier	Telephone & Web Site	*Customer Class
Abest Power & Gas of NJ, LLC 202 Smith Street Perth Amboy, NJ 08861	(888)987-6937 www.AbestPower.com	**R/C/I** **ACTIVE**
AEP Energy, Inc. f/k/a BlueStar Energy Services 309 Fellowship Road, Fl. 2 Mount Laurel, NJ 08054	(866) 258-3782 www.aepenergy.com	**R/C/I** **ACTIVE**
Agera Energy, LLC 115 route 46, Building F Parsippany, NJ 07054	(844) 692-4372 www.ageraenergy.com	R/C/I
Alpha Gas and Electric, LLC 641 5th Street Lakewood, NJ 08701	(855) 553-6374 www.alphagasandelectric.com	**R/C** **ACTIVE**
Ambit Northeast, LLC d/b/a Ambit Energy 103 Carnegie Center Suite 300 Princeton, NJ 08540	877-282-6284 www.ambitenergy.com	**R/C** **ACTIVE**
American Power & Gas of NJ, LLC - 10000 Lincoln Drive East – Suite 201Marlton, NJ 08053	(800) 205-7491 www.GoAPG.com	**R/C/I**
American Powernet Management, LP 437 North Grove St. Berlin, NJ 08009	(877) 977-2636 www.americanpowernet.com	**C/I** **ACTIVE**
Amerigreen Energy, Inc. 333 Sylvan Avenue, Suite 305 Englewood Cliffs, NJ 07632	888-559-4567 www.amerigreen.com	**C/I** **ACTIVE**
AP Gas & Electric, (NJ) LLC 10 North Park Place, Suite 420 Morristown, NJ 07960	(855) 544-4895 www.apgellc.com	**R/C/I** **ACTIVE**
Astral Energy LLC 16 Tyson Place Bergenfield, NJ 07621	(888)850-1872 www.AstralEnergyLLC.com	**R/C/I** **ACTIVE**

Barclays Capital Services, Inc. 70 Hudson Street Jersey City, NJ 07302-4585	(800) 526-7000 www.barclays.com	**C** **ACTIVE**
BBPC, LLC d/b/a Great Eastern Energy 116 Village Blvd. Suite 200 Princeton, NJ 08540	(888) 651-4121 www.greateasternenergy.com	**C** **ACTIVE**
Berkshire Energy Partners, LLC 9 Berkshire Road Landenberg, PA 19350 Attn: Dana A. LeSage, P.E.	(610) 255-5070 www.berkshireenergypartners.com	**C/I** **ACTIVE**
Blue Pilot Energy, LLC 197 State Rte. 18 South Ste. 3000 East Brunswick, NJ 08816	(800) 451-6356 www.bluepilotenergy.com	**R/C** **ACTIVE**
Brick Standard, LLC 235 Hudson Street Suite 1 Hoboken, NJ 07030	(201)706-8101 www.standardalternative.com	**C/I** **ACTIVE**
CCES LLC dba Clean Currents Energy Services 566 Terhune Street Teaneck, NJ 07666	(877) 933-2453 www.cleancurrents.com	**R/C** **ACTIVE**
Champion Energy Services, LLC 1200 Route 22 Bridgewater, NJ 08807	(888) 653-0093 www.championenergyservices.com	**R/C/I** **ACTIVE**
Choice Energy, LLC 4257 US Highway 9, Suite 6C Freehold, NJ 07728	(888) 565-4490 www.4choiceenergy.com	**R/C** **ACTIVE**
Clearview Electric, Inc. 1744 Lexington Avenue Pennsauken, NJ 08110	(888) CLR-VIEW (800) 746- 4702 www.clearviewenergy.com	**R/C/I** **ACTIVE**
Commerce Energy, Inc. 7 Cedar Terrace Ramsey, NJ 07446	1-866-587-8674 www.commerceenergy.com	**R/C** **ACTIVE**
Community Energy Inc. 51 Sandbrook Headquarters Road Stockton, NJ 08559	(866)946-3123 www.communityenergyinc.com	**R/C/I** **ACTIVE**

ConEdison Solutions Cherry Tree Corporate Center 535 State Highway Suite 180 Cherry Hill, NJ 08002	(888) 665-0955 www.conedsolutions.com	**C/I** **ACTIVE**
ConocoPhillips Company 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(800) 646-4427 www.conocophillips.com	**C/I** **ACTIVE**
Constellation New Energy, Inc. 900A Lake Street, Suite 2 Ramsey, NJ 07446	(888) 635-0827 www.constellation.com	**R/C/I** **ACTIVE**
Constellation Energy 900A Lake Street, Suite 2 Ramsey, NJ 07446	(877) 997-9995 www.constellation.com	**R** **ACTIVE**
Constellation Energy Services, Inc. **116 Village Boulevard** **Suite 200** **Princeton, NJ 08540**	1 (800) 536-0151 www.integrysenergy.com	**R/C/I**
Corporate Services Support Corp. **665 Howard Avenue** **Somerset, NJ 08873**	1(800) 761-4000 www.morganstanley.com	**C**
Credit Suisse, (USA) Inc. 700 College Road East Princeton, NJ 08450	(800) 325-2000 www.creditsuisse.com	**C** **ACTIVE**
Direct Energy Business, LLC 1 Hess Plaza Woodbridge	(888) 925-9115 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Direct Energy Business Marketing, LLC (fka Hess Energy Marketing) 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 http://www.business.directenergy.com/	**C/I** **ACTIVE**
Direct Energy Small Business, LLC (fka Hess Small Business Services, LLC) One Hess Plaza Woodbridge, NJ 07095	(888) 925-9115 http://www.business.directenergy.com/small-business	**C/I** **ACTIVE**

Direct Energy Services, LLC **1 Hess Plaza** **Woodbridge, NJ 07095**	1 (866) 348-4193 www.directenergy.com	**C/I** **INACTIVE**
Discount Energy Group, LLC 811 Church Road, Suite 149 Cherry Hill, New Jersey 08002	(800) 282-3331 www.discountenergygroup.com	**R/C** **ACTIVE**
DTE Energy Supply, Inc. One Gateway Center, Suite 2600 Newark, NJ 07102	(877) 332-2450 www.dtesupply.com	**C/I** **ACTIVE**
EDF Energy Services, LLC 1 Meadowlands Plaza Suite 200, Office No. 246 East Rutherford, NJ 07073	1 (877) 432-4530 www.edfenergyservices.com	**C/I**
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**
EnerPenn d/b/a **YEP Energy** 89 Headquarters Plaza North #1463 Morristown, NJ 07960	(855) 363-7736 www.yepenergyNJ.com	**R/C/I** **ACTIVE**
Ethical Electric Benefit Co. d/b/a Ethical Electric/d/b/a Clean Energy Option 100 Overlook Center, 2nd Fl. Princeton, NJ 08540	(888) 444-9452 www.ethicalelectric.com	**R/C** **ACTIVE**
Energy Service Providers, Inc., d/b/a New Jersey Gas & Electric 1 Bridge Plaza fl. 2 Fort Lee, NJ 07024	(866) 568-0290 www.njgande.com	**R/C** **ACTIVE**
Everyday Energy, LLC **One International Blvd., Suite 400** **Mahwah, NJ 07495-0400**	844-684-5506 www.energyrewards.comcast.com	**R/I**

FirstEnergy Solutions 150 West State Street Trenton, NJ 08608	(888) 254-63590- www.fes.com	**C/I** **ACTIVE**
First Point Power, LLC 90 Washington Valley Road Bedminister, NJ 07921	(888) 875-1711 www.firstpointpower.com	**R/C/I**
Frontier Utilities Northeast, LLC 199 New Road, Suite 61-187 Linwood, NJ 08221	(877) 437-6930 www.frontierutilities.com	**R/C/I**
Gateway Energy Services Corporation **1 Hess Plaza** **Woodbridge, NJ 07095**	(800) 805-8586 www.gesc.com	**R/C** **ACTIVE**
GDF SUEZ Energy Resources NA, Inc. 333 Thornall Street Sixth Floor Edison, NJ 08837	(866) 999-8374 www.gdfsuezenergyresources.com	**C/I** **ACTIVE**
GDF Suez Retail Energy Solutions LLC d/b/a THINK ENERGY 333 Thornall St. Sixth Floor Edison, NJ 08819	1-866-252-0078 www.mythinkenergy.com	**R/C/I** **ACTIVE**
Glacial Energy of New Jersey, Inc. 21 Pine Street, Suite 237 Rockaway, NJ 07866	(888) 452-2425 www.glacialenergy.com	**C/I** **ACTIVE**
Global Energy Marketing LLC 129 Wentz Avenue Springfield, NJ 07081	(800) 542-0778 www.globalp.com	**R/C/I** **ACTIVE**
Greenlight Energy, Inc. **2608 25th Road** **Astoria, NY 11102**	(888) 453-4427 www.greenlightenergy.us	**R**
Green Mountain Energy Company 211 Carnegie Center Drive Princeton, NJ 08540	(866) 767-5818 www.greenmountain.com/commercial-home	**C/I** **ACTIVE**

Harborside Energy LLC 101 Hudson Street Suite 2100 Jersey City, NJ 07302	(877) 940-3835 www.harborsideenergynj.com	**R/C** **ACTIVE**
Hess Corporation 1 Hess Plaza Woodbridge, NJ 07095	(800) 437-7872 www.hess.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	**R/C/I** **ACTIVE**
Holcim (US) Inc. 595 Morgan Boulevard Camden, NJ 08104	(800) 831-9507 ext. 4354 www.holcim.us	**I**
Hudson Energy Services, LLC 7 Cedar Street Ramsey, New Jersey 07466	(877) Hudson 9 www.hudsonenergyservices.com	**C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	(877) 887-6866 www.idtenergy.com	**R/C** **ACTIVE**
Independence Energy Group, LLC 211 Carnegie Center Princeton, NJ 08540	(877) 235-6708 www.chooseindependence.com	**R/C** **ACTIVE**
Inspire Energy Holdings LLC 923 Haddonfield Road 3rd Fl. Building B2 Cherry Hill, NJ 08002	(866) 403-2620 www.inspireenergy.com	**R/C/I**
Integrys Energy Services, Inc. 33 Wood Ave, South, Suite 610 Iselin, NJ 08830	(800) 536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Jsynergy, LLC 445 Central Ave. Suite 204 Cedarhurst, NY 11516	(516) 331-2020 Jsynergyllc.com	**R/C/I** **ACTIVE**
Kuehne Chemical Company, Inc. 86 North Hackensack Avenue South Kearney, NJ 07032	(973) 589-0700 kuehnechemical@comcast.net	**I**

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

Nordic Energy Services, LLC 50 Tice Boulevard, Suite 340 Woodcliff Lake, NJ 07677	(877) 808-1027 www.nordiceenergy.us.com	**R/C/I** **ACTIVE**
North American Power and Gas, LLC 222 Ridgedale Avenue Cedar Knolls, NJ 07927	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
North Eastern States, Inc. d/b/a Entrust Energy 90 Washington Valley Road Bedminster, NJ 07921	(888) 521-5861 www.entrustenergy.com	**R/C/I** **ACTIVE**
Oasis Power, LLC d/b/a Oasis Energy 11152 Westheimer, Suite 901 Houston, TX 77042	(800)324-3046 www.oasisenergy.com	**R/C** **ACTIVE**
Palmco Power NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	(877) 726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Park Power, LLC 1200 South Church St. Suite 23 Mount Laurel, NJ 08054	(856) 778-0079 www.parkpower.com	**R/C/I** **ACTIVE**
Plymouth Rock Energy, LLC 338 Maitland Avenue Teaneck, NJ 07666	(855) 32-POWER (76937) www.plymouthenergy.com	**R/C/I** **ACTIVE**
Power Management Co., LLC b/b/a PMC Lightsavers Limited Liability Company 1600 Moseley Road Victor, NY 14564	(585) 249-1360 www.powermanagementco.com	**C/I** **ACTIVE**
PPL Energy Plus, LLC Shrewsbury Executive Offices 788 Shrewsbury Ave., Suite 2178 Tinton Falls, NJ 07724	(800) 281-2000 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. 208 W. State Street Trenton, NJ 08608-1002	(847) 673-1959 www.prospectresources.com	**C** **ACTIVE**
Public Power & Utility of New Jersey, LLC One International Blvd, Suite 400 Mahwah, NJ 07495	(888) 354-4415 www.ppandu.com	**R/C/I** **ACTIVE**
Reliant Energy 211 Carnegie Center Princeton, NJ 08540	(877) 297-3795 (877) 297-3780 www.reliant.com	**R/C/I** **ACTIVE**
ResCom Energy LLC 18C Wave Crest Ave. Winfield Park, NJ 07036	(888) 238-4041 http://rescom-energy.com	**R/C/I** **ACTIVE**
Residents Energy, LLC 550 Broad Street Newark, NJ 07102	(888) 828-7374 www.residentsenergy.com	**R/C**
Respond Power LLC 1001 East Lawn Drive Teaneck, NJ 07666	(888) 625-6760 www.majorenergy.com	**R/C/I** **ACTIVE**
Save on Energy, LLC 1101 Red Ventures Drive Fort Mill, SC 29707	1 (877)-658-3183 www.saveonenergy.com	**R/C**
SFE Energy One Gateway Center Suite 2600 Newark, NJ 07012	1 (877) 316-6344 www.sfeenergy.com	**R/C/I** **ACTIVE**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	(800) 695-0666 www.sjnaturalgas.com	**C** **ACTIVE**
SmartEnergy Holdings, LLC 100 Overlook Center 2nd Floor Princeton, NJ NJ 08540 United States of America	(800) 443-4440 www.smartenergy.com	**R/C/I** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	(800) 266-6020 www.southjerseyenergy.com	**R/C/I** **ACTIVE**
Spark Energy Gas, LP/ Spark Energy	(713)600-2600	**R/C/I**

2105 City West Blvd. Suite 100 Houston, TX 77042	www.sparkenergy.com	**ACTIVE**
Sperian Energy Corp. 1200 Route 22 East, Suite 2000 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**
Starion Energy PA Inc. 101 Warburton Avenue Hawthorne, NJ 07506	(800) 600-3040 www.starionenergy.com	**R/C/I** **ACTIVE**
Stream Energy New Jersey, LLC 309 Fellowship Rd., Suite 200 Mt. Laurel, NJ 08054	(877) 369-8150 www.streamenergy.net	**R/C** **ACTIVE**
Summit Energy Services, Inc. 10350 Ormsby Park Place Suite 400 Louisville, KY 40223	1 (800) 90-SUMMIT www.summitenergy.com	**C/I** **ACTIVE**
Talen Energy Marketing, LLC **788 Shrewsbury Avenue, Suite 2178 Tinton Falls, NJ 07724**	(888) 289-7693 www.pplenergyplus.com/*	**R/C**
Texas Retail Energy LLC Park 80 West Plaza II, Suite 200 Saddle Brook, NJ 07663 Attn: Chris Hendrix	(866) 532-0761 Texasretailenergy.com	**C/I** **ACTIVE**
TransCanada Power Marketing Ltd. 190 Middlesex Essex Turnpike, Suite 200 Iselin, NJ 08830	(877) MEGAWAT www.transcanada.com/powermarketing	**C/I** **ACTIVE**
TriEagle Energy, LP 90 Washington Valley Rd Bedminster, NJ 07921	(877) 933-2453 www.trieagleenergy.com	**R/C/I** **ACTIVE**

UGI Energy Services, Inc. **dba UGI Energy Link** 224 Strawbridge Drive Suite 107 Moorestown, NJ 08057	(800) 427-8545 www.ugienergylink.com	**C/I** **ACTIVE**
Verde Energy USA, Inc. 2001 Route 46 Waterview Plaza Suite 301 Parsippany, NJ 07054	(800) 388-3862 www.lowcostpower.com	**R/C** **ACTIVE**
Viridian Energy 2001 Route 46, Waterview Plaza Suite 310 Parsippany, NJ 07054	(866) 663-2508 www.viridian.com	**R/C/I** **ACTIVE**
XOOM Energy New Jersey, LLC 744 Broad Street. 16th Floor Newark, NJ 07102	(888) 997-8979 www.xoomenergy.com	**R/C/I** **ACTIVE**
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 # 30655
Glen Rock - Ambulance Squad Building
Inventory of Major Equipment

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.	Current year	Years Old	ASHRAE life expectancy
Boiler	1	Lochinvar	KBN286	G11H10197072	Gas fired condensing boiler	285 MBH	95%	Boiler Room	Entire building	2012	27		2015	3	30
Boiler Pump	2	B&G	Unavailable	Unavailable	Boiler Primary Pump	Fractional HP	85%	Boiler Room	Boiler	2012	27		2015	3	30
HHW Zone Pumps	3	Taco	Various	Various	Heating Hot Water Zone Pumps	Fractional HP	85%	Boiler Room	Entire building	2012	12		2015	3	15
DHW Heater	1	Bradford White	MI5036EN10	ZF3260902	Domestic Hot Water Heater	50 Gallons	80%	Boiler Room	Bathrooms & Kitchen	2015	20		2015	0	20
AHU	1	Carrier	FE4ANB006	4013A82563	Air Handling Unit w/ HHW and DX Cooling Coils	100 MBH/5 Tons	15 EER	Attic	Entire building	2013	13		2015	2	15
ACCU	1	Carrier	24ANB160A310	3013E14162	Air Cooled Condnesing Unit	5 Tons	15 EER	Outside Pad Mounted	Entire building	2013	13		2015	2	15
ACCU	1	Carrier	38CK030300	1994E14904	Air Cooled Condnesing Unit	2.5 Tons	8 EER	Outside Pad Mounted	Garage	1994	-6		2015	21	15

APPENDIX C

ECM Calculations and Cost Summary

Glen Rock
CHA Project Number: 30655

Rate of Discount (used for NPV) 3.0%

Utility Costs		Yearly Usage	Existing MT CO	Metric Ton Carbon Dioxide Equivalent	Building Area
$ 0.184	$/kWh blended			0.000420205	2,328
$ 0.184	$/kWh supply	27,564	11.58	0.000420205	
$ 4.28	$/kW	10.9		0	
$ 1.12	$/Therm	1,929	10.29	0.00533471	
$ 5.50	$/kgals	200		0	
	$/Gal				

Annual Utility Cost		
Electric	Natural Gas	Fuel Oil
$ 5,066	$ 2,153	

Ambulance

Recommend? Y or N		Item	Savings kW	kWh	therms	No. 2 Oil gal	Water kgal	$	Cost	Simple Payback	Life Expectancy	Equivalent CO2 (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings kW	kWh	therms	kgal/yr	$	ROI	NPV	IRR
Y	ECM-1	Replace A/C unit with high efficiency unit	1.5	2,545	0	0	0	545	$ 5,900	10.8	15	1.1	$ 230	N	10.4	22.6	38,171	0	0	$ 8,177	0.4	$838	5.0%
Y	ECM-2	Replace DHW heater condensing DHW	0.0	0	113	0	0	126	$ 8,511	67.6	10	0.6	$ 50	N	67.2	0.0	0	1,128	0	$ 1,259	(0.9)	($7,388)	-25.0%
Y	ECM-3	Install pipe insulation	0.0	0	123	0	0	138	$ 844	6.1	15	0.7	$ -	N	6.1	0.0	0	1,851	0	$ 2,066	1.4	$800	14.1%
Y	ECM-4	Replace high flow fixtures with low flow fixtures	0.0	0	228	0	115	888	$ 6,780	7.6	15.0	1.2	$ -	N	7.6	0.0	0	3,421	1,728	$ 13,325	1.0	$3,825	9.9%
Y	ECM-L1	Lighting Replacements / Upgrades	4.5	5,787	0	0	0	1,295	$ 20,422	15.8	15.0	2.4	$ 1,590	N	14.5	67.5	86,805	0	0	$ 19,421	(0.0)	($3,376)	0.4%
		Total (Not Including [B] Option ECMs or L1, L2)	**6.0**	**8,332**	**464**	**0**	**115**	**$ 2,992**	**$ 42,458**	**14.2**	**14.0**	**6**	**$ 1,870**		**13.6**	**90**	**124,976**	**6,400**	**1,728**	**$ 44,248**	**0.0**	**($6,792)**	**0.4%**
		Recommended Measures (highlighted green above)	**6.0**	**8,332**	**464**	**0**	**115**	**$ 2,992**	**$ 42,458**	**14.2**	**14.0**	**6**	**$ 1,870**	**0**	**13.6**	**90**	**124,976**	**6,400**	**1,728**	**$ 44,248**	**0.0**	**($6,792)**	**0.4%**
		% of Existing	**55%**	**30.23%**	**24.07%**	**0**	**57.62%**																

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

Multipliers	
Material:	1.027
Labor:	1.246
Equipment:	1.124

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

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

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

Glen Rock
CHA Project Number: 30655
Ambulance

ECM-1: Replace Unitary HVAC Equipment With More Efficient Unitary Equipment

Description: This ECM evaluates the energy savings associated with replacing older less efficient cooling equipment with modern high efficiency unitary equipment havings the same capacity. Specifically, it is proposed to replace the old air cooled condensing unit serving the garage area with a high efficiency unit.

Equipment Tag	Equipment Description	General Type	Cooling Capacity (Btu/h)	Heating Capacity (Btu/h)
CU-1	2.5 Ton	HVAC	30,000	N/A

Item	Value	Units	Formula/Comments	
Demand Rate	$ 4.28	/ kW		
Electricity Rate	$ 0.18	/kWh		
FORMULA CONSTANTS				
Coincidence Factor	0.67		NJ Protocols	
Conversion	3.412	btu/kW		
COOLING - HVAC				
Cooling Capacity	30,000	btu/hr		btuh
Baseline EER	8.0		See Table Below	EERb
Proposed EER	20.0		Equipment	EERq
Equivalent Full Load Hours	1,131	hrs	NJ Protocols	
Demand Savings	1.51	kW		
Energy Savings	2,545	kWh		
HEATING - Heat Pump				
Heating Capacity	-	btu/h		
Baseline Heating EER	-		See Table Below	
Proposed Heating EER	-		Equipment	
Equivalent Full Load Hours	800	hrs	NJ Protocols	
Heating Savings	-	kWh		
COOLING - Heat Pump				
Cooling Capacity	-	btu/h		
Baseline Cooling EER	-		See Table Below	
Proposed Cooling EER	-		Equipment	
Equivalent Full Load Hours	381	hrs	NJ Protocols	
Cooling Savings	-	kWh		
SAVINGS				
Demand Savings	1.51	kW		
Energy Savings	2,545	kWh		
Cost Savings	$ 474			

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

Glen Rock
CHA Project Number: 30655
Ambulance

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-1: Replace Unitary HVAC Equipment With More Efficient Unitary Equipment - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Remove one condensing unit	1	EA		$ 250		$ -	$ 312	$ -	$ 312	RS Means 2012
30,000 BTU Condensing unit	1	EA	$ 2,200	$ 1,200		$ 2,259	$ 1,495	$ -	$ 3,755	RS Means 2012
Electrical	1	EA	$ 150	$ 150		$ 154	$ 187	$ -	$ 341	RS Means 2012

$ 4,407	Subtotal
$ 1,542	35% Contingency
$ 5,900	**Total**

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

Glen Rock
CHA Project Number: 30655
Ambulance

ECM-2: Replace Gas-Fired DHW Heater with Condensing Gas-Fired DHW Heater

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

Item	Value	Units	Formula/Comments
Avg. Monthly Utility Demand by Water Heater	24	Therms/month	Calculated from utility bill
Total Annual Utility Demand by Water Heater	28,900	MBTU/yr	1therm = 100 MBTU
Existing DHW Heater Efficiency	80%		Per manufacturer nameplate
Total Annual Hot Water Demand (w/ standby losses)	23,120	MBTU/yr	
Existing Tank Size	50	Gallons	Per manufacturer nameplate
Hot Water Piping System Capacity	5	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	140	˚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	6,826	MBTU/yr	
New Tank Size	0	Gallons	Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Hot Water Piping System Capacity	5	Gallons	Estimated Per existing system (includes HWR piping)
Hot Water Temperature	140	˚F	
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)	0.1	MBH	
Annual Standby Hot Water Load	621	MBTU/yr	
Total Annual Hot Water Demand	16,915	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Proposed Fuel Use	176	Therns	Standby Losses and inefficient DHW heater eliminated
Utility Cost	$1.12	$/Therm	
Existing Operating Cost of DHW	$323	$/yr	
Proposed Operating Cost of DHW	$197	$/yr	

Savings Summary:

Utility	Energy Savings	Cost Savings
Therms/yr	113	$126

Glen Rock
CHA Project Number: 30655
Ambulance

ECM-2: Replace Gas-Fired DHW Heater with Condensing Gas-Fired DHW Heater - 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.		
Gas-Fired DHW Heater Removal	1	LS		$ 50		$ -	$ 62	$ -	$ 62	RS Means 2012
High Efficiency Gas-Fired DHW Heater	1	EA	$ 4,000	$ 280		$ 4,108	$ 349	$ -	$ 4,457	RS Means 2012
Miscellaneous Electrical	1	LS	$ 300			$ 308	$ -	$ -	$ 308	RS Means 2012
Venting Kit	1	EA	$ 450	$ 650		$ 462	$ 810	$ -	$ 1,272	RS Means 2012
Miscellaneous Piping and Valves	1	LS	$ 200			$ 205	$ -	$ -	$ 205	RS Means 2012

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

$ 6,305	Subtotal
$ 2,207	35% Contingency
$ 8,511	**Total**

Glen Rock
CHA Project Number: 30655
Ambulance

ECM-3: Install Piping Insulation (Bare Pipe)

Description This ECM evaluates insulating heating system piping which is not currently insulated to reduce heat loss from piping and heat gain to the spaces.

Given

		Pipe #1	Pipe #2	Pipe #3	Pipe #4	
Fuel Energy Cost	=				$ 1.12	$/Therm (Nat'l Gas)
Operation (Hours/Week)	=				45	Hours/Week
Operation (Heating Weeks/Year)	=				52	Weeks/Year
Operation (Hours/Year)	=				2340	Hours/Year
Heating Media	=				Water	
Piping Material	=				Mild Steel	
Ambient Temperature	=				72	°F
Pipe Diameter	=	1 .00	inches 2	inches 4 .0	inches 2 .00	inches
Pipe Length	=	100.00	feet 0.00	feet 0.00	feet 0.00	feet

Assumption

Min. Pipe Insulation Recommended	=	1.00	inches 1.50	inches 1.50	inches 1.50	inches
Circulating Temperature	=				150	°F
Heating Efficiency	=				80%	
Pipe Insulation Conductivity	=				0.29	Btu*in./(h*ft2*F)

Formula

Piping Correction Factor = (Current Transmission Coefficient / Reference Transmission Coefficient)
Temperature Correction Factor = (Circulating Temperature - Ambient Temperature) / (Circulating Temperature - Reference Temperature)
Hourly Heat Loss per pipe size and length = (Heat loss per foot [from chart]) x (Piping Correction Factor) x (Temperature Correction Factor) x (Pipe Length)
Seasonal Heat Loss = (Hourly Heat Loss Total) x (Operating hours) / (Heating Efficiency) / (1,000 btu/Mbtu)

Energy Loss = (Seasonal Heat Loss) / (Conversion Factor [MBtu/Unit])
Energy Loss Cost = (Energy Loss) x (cost/unit)

Calculation

Existing

Piping Correction Factor = (Current Transmission Coefficient 2.00 / Reference Transmission Coefficient 2.00) = **1.00**

Temperature Correction Factor = (Circulating Temp. 150 - Ambient Temp. 72) / (Circulating Temp. 150 - Reference Temp. 80) = **1.11**

	Heat Loss per foot	Piping CF	Temperature CF	Pipe Length		
Heat Loss Pipe #1 (Hourly)	48.87	1.00	1.11	100.00	5,446	Btuh
Heat Loss Pipe #2 (Hourly)	84.92	1.00	1.11	0.00	-	Btuh
Heat Loss Pipe #3 (Hourly)	151.61	1.00	1.11	0.00	-	Btuh
Heat Loss Pipe #4 (Hourly)	84.92	1.00	1.11	0.00	-	Btuh
					5,446	**Btuh**

Seasonal Heat Loss = (Hourly Heat Loss 5,446) x (operating Hours 2,340) / (Heating Efficiency 80%) / (Factor 1,000) = **15,928 Mbtu**

Existing Energy Loss = (Seasonal Heat Loss 15,928) / (Btu/unit 100) = **159 Therm**

Existing Energy Loss Cost = (Unit 159) x (Cost per Unit $ 1.12) = **$ 178**

New

	Heat Loss per foot	Piping CF	Temperature CF	Pipe Length		
Heat Loss Pipe #1 (Hourly)	11.00	1.00	1.11	100.00	1,226	Btuh
Heat Loss Pipe #2 (Hourly)	13.00	1.00	1.11	0.00	-	Btuh
Heat Loss Pipe #3 (Hourly)	19.00	1.00	1.11	0.00	-	Btuh
Heat Loss Pipe #4 (Hourly)	13.00	1.00	1.11	0.00	-	Btuh
					1,226	**Btuh**

Seasonal Heat Loss = (Hourly Heat Loss 1,226) x (operating Hours 2,340) / (Heating Efficiency 80%) / (Factor 1,000) = **3,585 Mbtu**

New Energy Loss = (Seasonal Heat Loss 3,585) / (Btu/unit 100) = **36 Therm**

New Energy Loss Cost = (Unit 36) x (Cost per Unit $ 1.12) = **$ 40**

Result

Existing Heat Loss		**159**	**Therm**	**$**	**178**	
New Heat Loss		**36**	**Therm**	**$**	**40**	
Savings	**100%**	**123**	**Therm**	**$**	**138**	**77.5%**

Conversion Factors

$/MCF (Nat'l Gas)	1	1,030,000	btu/MCF	MCF	Mbh/MCF	1,030	MMbh/MCF	####
$/CCF (Nat'l Gas)	2	103,000	btu/CCF	CCF	Mbh/CCF	103	MMbh/CCF	####
$/CF (Nat'l Gas)	3	1,030	btu/CF	CF	Mbh/CF	1.030	MMbh/CF	####
$/Therm (Nat'l Gas)	4	100,000	btu/Therm	Therm	Mbh/Therm	100	MMbh/Therm	####
$/gal (LP Gas)	5	91,500	btu/gallon	gallons	Mbh/gallon	91.5	MMbh/gallon	####
$/gal (Fuel Oil #2)	6	139,000	btu/gallon	gallons	Mbh/gallon	139	MMbh/gallon	####
$/lb Steam	7	975	btu/lb Steam	lb Steam	Mbh/lb Steam	0.975	MMbh/lb Steam	####
$/1000 lbs Steam	8	975,000	btu/1000 lbs Stear	1000 lbs Steam	Mbh/1000 lbs Steam	975	MMbh/1000 lbs S	####

This chart is not used but is left for future reference

Pipe Diameter	Initial Bare	Final (1) R=2	Final (2) ASHRAE standard	ASHRAE standard 40-80	Final (2) ASHRAE stnd x pipe length	Initial Bare x pipe length	
(I.d.)	BTU/hr/ft/°F	BTU/hr/ft/°F	BTU/hr/ft/°F	Relative thickness in inches	Btu/hr/°F		
1/2	0.27	0.18	0.15	0.75	30.0	54.0	44%
3/4	0.61	0.27	0.21	0.75	42.0	122.0	66%
1	0.77	0.30	0.23	0.75	46.0	154.0	70%
1 1/2	1.06	0.34	0.20	1.00	40.0	212.0	81%
2	1.30	0.36	0.21	1.00	42.0	260.0	84%
3	1.86	0.39	0.22	1.00	44.0	372.0	88%
4	2.30	0.41	0.22	1.00	44.0	460.0	90%
6	3.35	0.44	0.23	1.00	46.0	670.0	93%

Select one pipe length from below: 200
25 ft
50 ft
100 ft
150 ft
200 ft

Glen Rock
CHA Project Number: 30655
Ambulance

ECM-3: Install Piping Insulation (Bare Pipe) - 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.		
Fiberglass pipe insulation	100	LF	$ 4.00	$1.72		$ 411	$ 214	$ -	$ 625	RS Means 2012
						$ -	$ -	$ -	$ -	

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

$ 625	Subtotal
$ 219	35% Contingency
$ 844	**Total**

Glen Rock
CHA Project Number: 30655
Ambulance

ECM-4: Replace urinals and flush valves with low flow

Description: This ECM evaluates the water savings associated with replacing/ upgrading urinals with 0.125 GPF urinals and or flush valves.

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$5.50	$ / kGal
Urinals in Building to be replaced	1	
Average Flushes / Urinal (per Day)	60	Based on # of occupants
Average Gallons / Flush	2.5	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	1	
Proposed Gallons / Flush	0.125	Gal
Proposed Material Cost of new urinal & valve	$1,200	RS Means 2012
Proposed Installation Cost of new urinal & valve	$1,000	RS Means 2012
Total cost of new urinals & valves		

SAVINGS		
Current Urinal Water Use	54.75	kGal / year
Proposed Urinal Water Use	2.74	kGal / year
Water Savings	52.01	kGal / year
Cost Savings	$286	/ year

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

Glen Rock
CHA Project Number: 30655
Ambulance

ECM-4: Replace toilets and flush valves with low flow

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

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$5.50	$ / kGal
Toilets in Building	1	
Average Flushes / Toilet (per Day)	60	Based on # of occupants
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	1	
Proposed Gallons / Flush	1.28	Gal

SAVINGS		
Current Toilet Water Use	76.65	kGal / year
Proposed Toilet Water Use	28.03	kGal / year
Water Savings	48.62	kGal / year
Cost Savings	$267	/ year

Glen Rock
CHA Project Number: 30655
Ambulance

ECM-4: Replace faucets with low flow

Description; This ECM evaluates the water savings resulting from replacing/ upgrading faucets to 0.5 gallon per minute flow

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$5.50	$ / kGal
Faucets in Building	2	
Average Uses / Faucet (per day)	60	Based on # of occupants
Average Time of Use	10.0	seconds
Average Flowrate	2.5	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	2	
Proposed Flowrate	0.5	gpm

HEATING SAVINGS		
Fuel Cost	$ 1.12	/Therm
Number of Faucets	2	
Hours per Day of Usage	0.5	hrs
Days per Year of Facility Usage	365	days
Average Flowrate	2.5	gpm
Proposed Flowrate	0.5	gpm
Heat Content of Water	8.33	Btu/gal/F
Temperature Difference (Intake and Output)	50	F
Water Heating Equipment Efficiency	80%	
Conversion Factor	100,000	Btu/Therm
SAVINGS		
Current Faucet Water Use	18.25	kGal / year
Proposed Faucet Water Use	3.65	kGal / year
Water Savings	14.60	kGal / year
Heating Savings	228	Therms
Cost Savings	$335	/ year

Savings calculation formulas are taken from NJ Protocols document for Faucet

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

Glen Rock
CHA Project Number: 30655
Ambulance

Replace Plumbing Fixtures with Low-Flow Equivalents - 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.		
									$ -	
Low-Flow Urinal	1	EA	$ 400	$ 1,000	$ -	$ 411	$ 1,246	$ -	$ 1,657	RS Means
Low-Flow Toilet	1	EA	$ 1,400	$ 1,000	$ -	$ 1,438	$ 1,246	$ -	$ 2,684	RS Means
Low-Flow Faucet	2	EA	$ 150	$ 150	$ -	$ 308	$ 374	$ -	$ 682	RS Means
						$ -	$ -	$ -	$ -	

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

$ 5,023	Subtotal
$ 1,758	35% Contingency
$ 6,780	**Total**

Glen Rock
CHA Project Number: 30655
Ambulance

New Jersey Pay For Performance Incentive Program

Note: The following calculation is based on the New Jersey Pay For Performance Incentive Program per April, 2012
Building must have a minimum average electric demand of 100 kW. This minimum is waived for buildings owned by local governements or non-profit organizations.
Values used in this calculation are for ALL identified measures except for alternate ECMs, regardless of payback or IR
P4P estimated incentives represent a best case scenario, and will likely be lower depending on which measures are included. The savings displayed here are not guaranteed to qualify for P4P incentives if IRR or payback requirements are not met.

Total Building Area (Square Feet)	2,328
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilites (BPU)

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

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$5,066	$2,153
Existing Usage (from utility)	27,564	1,929
Proposed Savings	8,332	464
Existing Total MMBtus	287	
Proposed Savings MMBtus	75	
% Energy Reduction	**26.1%**	
Proposed Annual Savings	$2,992	

	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	$916	$580	$1,497
Incentive #3	$916	$580	$1,497
Total All Incentives	**$1,833**	**$1,161**	**$7,994**

Total Project Cost	$42,458

		Allowable Incentive
% Incentives #1 of Utility Cost*	69.3%	$3,609
% Incentives #2 of Project Cost**	3.5%	$1,497
% Incentives #3 of Project Cost**	3.5%	$1,497
Total Eligible Incentives***	**$6,603**	
Project Cost w/ Incentives	$35,855	

Project Payback (years)	
w/o Incentives	w/ Incentives
14.2	12.0

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

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

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

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

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

Energy Audit of Ambulance Building
CHA Project No. 30655
Existing Lighting & Audit Input

Cost of Electricity: **$0.123** **$/kWh**
$3.03 **$/kW**

			EXISTING CONDITIONS								Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes
117LED	Power Room	Linen/Utility/Wet/Janitor/Electrical	1	CF 23	CFS23/1	23	0.02	SW	1000	23	NONE	
250	Garage 1	General Common	6	T 54 W F 2 (ELE) (T-5)	F42GHL	117	0.70	SW	1456	1,022	NONE	
18LED	Garage 2	General Common	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1456	326	NONE	
250	Ready Room	General Common	6	T 54 W F 2 (ELE) (T-5)	F42GHL	117	0.70	SW	1456	1,022	NONE	
254LED	Storage	Storage Areas	1	CFQ26/2	CFQ26/2	66	0.07	SW	520	34	NONE	
261LED	Storage	Storage Areas	1	PAR 38 SP	H100/1	100	0.10	SW	520	52	NONE	
40LED	Bathroom	Restroom	1	T 32 R F 2 (ELE)	F42LL	60	0.06	OCC	4300	258	NONE	
117LED	Boiler	Boiler Room	1	CF 23	CFS23/1	23	0.02	SW	2688	62	NONE	
40LED	Office	Offices	1	T 32 R F 2 (ELE)	F42LL	60	0.06	SW	780	47	NONE	
71LED	Office	Offices	1	I 60	I60/2	120	0.12	SW	780	94	NONE	
71LED	Stair	Stairway	8	I 60	I60/2	120	0.96	SW	600	576	NONE	
261LED	Meeting Room	Conference	20	PAR 38 SP	H100/1	100	2.00	SW	1008	2,016	NONE	
261LED	Meeting Room	Conference	15	PAR 38 SP	H100/1	100	1.50	SW	1008	1,512	NONE	
261LED	Kitchen	Kitchen	7	PAR 38 SP	H100/1	100	0.70	SW	1344	941	NONE	
71LED	Bathroom	Restroom	2	I 60	I60/2	120	0.24	SW	4300	1,032	NONE	
71LED	Bathroom	Restroom	2	I 60	I60/2	120	0.24	SW	4300	1,032	NONE	
71LED	Closet	Storage Areas	2	I 60	I60/2	120	0.24		520	125	NONE	
	Total		**77**				**7.96**			**10,174**		

#N/A

Energy Audit of Ambulance Building
CHA Project No. 30655
Existing Lighting & Audit Input

Cost of Electricity: $0.123 $/kWh
$3.03 $/kW

			EXISTING CONDITIONS								Retrofit Control	
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh		
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	Describe Usage Type using Operating Hours	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	Retrofit control device	Notes

Energy Audit of Ambulance Building
CHA Project No. 30655
ECM-L1 Lighting Replacements

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kWh Saved) * ($/kWh)	Cost for renovations to lighting system	Prescriptive Lighting Measures	Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
117LED	Power Room	1	CF 23	CFS23/1	23	0.0	SW	1000	23	1	1A19LED	1A19LED	8	0.0	SW	1,000	8	15	0.0	$ 2.39	$ 10.13	$0	4.2	4.2
250	Garage 1	6	T 54 W F 2 (ELE) (T-5)	F42GHL	117	0.7	SW	1456	1,022	6	T 54 W F 2 (ELE) (T-5)	F42GHL	117	0.7	SW	1,456	1,022	-	0.0	$ -	$ -	$0		#DIV/0!
18LED	Garage 2	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1456	326	2	T 74 R LED	RTLED50	50	0.1	SW	1,456	146	181	0.1	$ 26.72	$ 472.50	$0	17.7	17.7
250	Ready Room	6	T 54 W F 2 (ELE) (T-5)	F42GHL	117	0.7	SW	1456	1,022	6	T 54 W F 2 (ELE) (T-5)	F42GHL	117	0.7	SW	1,456	1,022	-	0.0	$ -	$ -	$0		#DIV/0!
254LED	Storage	1	CFQ26/2	CFQ26/2	66	0.1	SW	520	34	1	EVO35/10	EVO35/10	39	0.0	SW	520	20	14	0.0	$ 2.71	$ 438.75	$35	162.0	149.1
261LED	Storage	1	PAR 38 SP	H100/1	100	0.1	SW	520	52	1	EVO35/10	EVO35/10	39	0.0	SW	520	20	32	0.1	$ 6.12	$ 438.75	$35	71.7	66.0
40LED	Bathroom	1	T 32 R F 2 (ELE)	F42LL	60	0.1	OCC	4300	258	1	T 38 R LED	RTLED38	38	0.0	OCC	4,300	163	95	0.0	$ 12.44	$ 236.25	$25	19.0	17.0
117LED	Boiler	1	CF 23	CFS23/1	23	0.0	SW	2688	62	1	1A19LED	1A19LED	8	0.0	SW	2,688	22	40	0.0	$ 5.50	$ 10.13	$0	1.8	1.8
40LED	Office	1	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	780	47	1	T 38 R LED	RTLED38	38	0.0	SW	780	30	17	0.0	$ 2.91	$ 236.25	$25	81.2	72.6
71LED	Office	1	I 60	I60/2	120	0.1	SW	780	94	1	1A19LED	1A19LED	8	0.0	SW	780	6	87	0.1	$ 14.82	$ 10.13	$0	0.7	0.7
71LED	Stair	8	I 60	I60/2	120	1.0	SW	600	576	8	1A19LED	1A19LED	8	0.1	SW	600	38	538	0.9	$ 98.70	$ 81.00	$0	0.8	0.8
261LED	Meeting Room	20	PAR 38 SP	H100/1	100	2.0	SW	1008	2,016	20	EVO35/10	EVO35/10	39	0.8	SW	1,008	786	1,230	1.2	$ 195.62	$ 8,775.00	$700	44.9	41.3
261LED	Meeting Room	15	PAR 38 SP	H100/1	100	1.5	SW	1008	1,512	15	EVO35/10	EVO35/10	39	0.6	SW	1,008	590	922	0.9	$ 146.71	$ 6,581.25	$525	44.9	41.3
261LED	Kitchen	7	PAR 38 SP	H100/1	100	0.7	SW	1344	941	7	EVO35/10	EVO35/10	39	0.3	SW	1,344	367	574	0.4	$ 86.11	$ 3,071.25	$245	35.7	32.8
71LED	Bathroom	2	I 60	I60/2	120	0.2	SW	4300	1,032	2	1A19LED	1A19LED	8	0.0	SW	4,300	69	963	0.2	$ 126.62	$ 20.25	$0	0.2	0.2
71LED	Bathroom	2	I 60	I60/2	120	0.2	SW	4300	1,032	2	1A19LED	1A19LED	8	0.0	SW	4,300	69	963	0.2	$ 126.62	$ 20.25	$0	0.2	0.2
71LED	Closet	2	I 60	I60/2	120	0.2		520	125	2	1A19LED	1A19LED	8	0.0		520	8	116	0.2	$ 22.47	$ 20.25	$0	0.9	0.9
	Total	**77**				**8.0**			**10,174**	**77**			**611**	**3.4**			**4,386**	**5,787**	**4.5**	**$876**	**$20,422**	**$1,590**		
																	Demand Savings			**4.5**	**$165**			
																	kWh Savings			**5,787**	**$712**			
																	Total savings				**$876**		**23.3**	**21.5**

APPENDIX D

Photos

APPENDIX F – PHOTOS

1. Hot Water Unit Heater

2. Boiler

3. Existing Uninsulated Piping in Boiler Room

4. Air Conditioning Unit 1

5. Air Conditioning Unit 2

6. Generator

7. Heat Pump

APPENDIX E

EPA Benchmarking Report

ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

Ambulance Squad

Primary Property Function: Other - Public Services
Gross Floor Area (ft²): 2,328
Built: 1929

For Year Ending: December 31, 2014
Date Generated: October 29, 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	Property Owner	Primary Contact
Ambulance Squad 1 Harding Plaza Glen Rock, New Jersey 07452	Borough of Glen Rock 1 Harding Plaza Glen Rock, NJ 07452 (201) 670-3956	Lenora Benjamin 1 Harding Plaza Glen Rock, NJ 07452 (201) 670-3956 srivera@chacompanies.com

Property ID: 4615907

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
101.3 kBtu/ft²

Source EUI
144.9 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	192,900 (82%)
Electric - Grid (kBtu)	42,950 (18%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	86.1
National Median Source EUI (kBtu/ft²)	123.1
% Diff from National Median Source EUI	18%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	16

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

Lenora Benjamin
1 Harding Plaza
Glen Rock, NJ 07452
(201) 670-3956
srivera@chacompanies.com

Professional Engineer Stamp (if applicable)