BOROUGH OF LITTLE FERRY

SENIOR CENTER and PUBLIC SAFETY BUILDING

Main and Pickens St., Little Ferry, NJ 07643

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

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CHA PROJECT NO. 28948

TABLE OF CONTENTS

APPENDICES

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 the Borough of Little Ferry 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
Senior Center/Public Safety Building	Main & Pickens St., Little Falls, NJ 08534	15,000	1980

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)
Senior Center/Public Safety Building	19,818	1,514	4,287	19.4

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

Each measure recommended by CHA typically has a stand-alone simple payback period of 15 years or less. However, if the owner 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

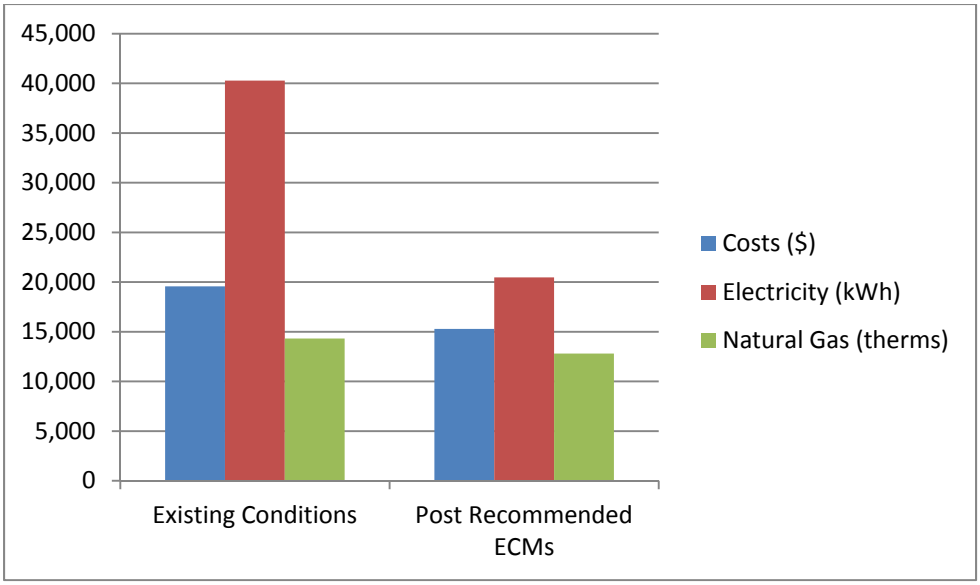
ECM #	Energy Conservation Measure	Est. Costs ($)	Est. Savings ($/year)	Payback w/o Incentive	Potential Incentive ($)*	Payback w/ Incentive	Recommended
1	Window Replacements	87,100	576	151.3	0	151.3	N
2	3M Window Film	5,200	371	14.0	0	14.0	Y
3	Replace Roof and Insulate	134,250	609	220.4	0	220.4	N
4	Door Sweeps and Seals	2,074	232	8.9	0	8.9	Y
5	Add Condensing Boiler	24,134	239	101.0	300	99.8	Y
6	Replace (1) RTU with (2) RTUs	80,700	1,241	65.0	600	64.5	N
7	Install AC Unit Controllers	600	243	2.5	0	2.5	Y
8	Demand Controlled Ventilation	10,600	519	20.4	0	20.4	Y
9	Replace DHW Heater with Condensing Unit	9,438	445	21.2	300	20.5	Y
10	Low Flow Plumbing Fixtures	85	323	0.3	0	0.3	Y
L1**	Lighting Replacements	30,480	1,821	16.7	2,085	15.6	N
L2**	Lighting Controls	513	182	2.8	80	2.4	N
L3	Lighting Replacements with Controls	30,993	1,915	16.2	2,165	15.1	Y
	Total**	**304,474**	**5,472**	**56**	**2,765**	**55**	
	Total (Recommended)	**83,124**	**4,287**	**19.4**	**2,765**	**18.7**	

* Incentive shown is per the New Jersey Clean Energy SmartStart Prescriptive Option. Other incentives may apply. Refer to section 6.0.
** These ECMs are not included in the Total, as they are alternate measures not recommended.

This building has an existing 29 kW roof mounted PV system. The alternative energy measure *Solar PV Electricity Generation* is not recommended for further study, due to the fact that there is insufficient roof space for additional PV panels.

If the Borough of Little Ferry implements the recommended ECMs, energy savings would be as follows:

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	19,565	15,278	22%
Electricity (kWh)	40,283	20,465	49%
Natural Gas (therms)	14,313	12,799	11%
Site EUI (kbtu/SF/Yr)	104.6	90.0	



2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

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

Building Name: Senior Center & Public Safety Building
Address: Main and Pickens St., Little Ferry, NJ
Gross Floor Area: 15,000 Square Feet
Number of Floors: 2
Year Built: 1980

Description of Spaces: One large building is divided into two main sections: Public Safety, and a Senior Center. Spaces include offices, meeting rooms, garage bays, storage rooms, toilet rooms and restrooms.
Description of Occupancy: There are approximately 10 staff members.
Number of Computers: The building has approximately 5 desktop and laptop computers.
Building Usage: Hours of operation at the Senior Center are 8:00 AM – 4:30 PM Monday through Friday. Hours of operation at the Public Safety Building are 24/7, and in general the occupied hours are unpredictable.

Building Envelope

Construction Materials: The building is constructed of structural steel framing with brick exterior and masonry block exterior. Interior walls consist of both sheetrock and concrete block. Exterior walls are insulated per the code at the time of construction, which in 1980 was probably to R-13.
Roof: The roof is surfaced with an adhered asphalt membrane. The roof is in poor to fair condition. An ECM is included which evaluates replacing the roof and adding insulation.

Windows The building has a mix of aluminum framed double pane windows, and wood framed casement style windows. Many seals are not intact, and most of the windows are in poor condition. An ECM is included for window replacement.
Exterior Doors: Most exterior doors are steel jacketed without windows. Main entrance doors are steel framed storefront style. Some of the sweeps and seals are in poor condition, and should be replaced. An ECM addressing this issue is included.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: Heat for the building is provided by: two (2) identical Flex-Heat hot water boilers, four (4) gas-fired infra-red radiant heaters, and one gas-fired rooftop unit. The boilers produce hot water that is pumped to perimeter finned radiation and hydronic unit heaters. Nameplate data on the boilers was not available, however it is estimated that they are 7-9 years old, and with a heating capacity of 750 MBH each. The boilers operate at approximately 80-82% combustion efficiency. An ECM is included which evaluates installing one wall-mounted high efficiency condensing boiler into the Boiler Rm. The large Public Safety garage bay area is heated by the four (4) Reznor infra-red heaters. Public Safety's Meeting Rm and Break Rm are heated by a gas-fired packaged Tempstar rooftop unit that appears to be at least 15 years old and is nearing the end of its useful life. This unit also provides approximately 5 tons of cooling. An ECM is included which evaluates replacing this unit with two RTUs.

Cooling: The building is approximately 50% cooled. Garage bay areas of the Public Safety Building are not cooled; all other areas of the building are fully air conditioned. A 2012 Trane rooftop air conditioner with 10 tons of DX cooling serves the Senior Center. Offices in both sections of the building use through-wall 1-ton AC units for cooling. The Tempstar packaged RTU is a single zone unit which serves the Break Rm and the Meeting Rm in the Public Safety Building. The Meeting Room is infrequently used but is kept fully air conditioned even when unoccupied. As described above, this unit is nearing the end of its useful life. An ECM is included which evaluates replacing the Tempstar unit with two smaller units, one for each room.

Ventilation: Ventilation air is provided by the two (2) packaged rooftop units which bring in outside air through the units themselves and mix it with supply air. Perimeter rooms are ventilated by operable windows. In general, building ventilation is adequate and no associated ECMs are included.

Exhaust: The facility utilizes exhaust fans of various sizes located on the roof to exhaust air from restrooms, garage bays, and storage areas. Within the Public Safety main garage bay area, several ceiling hung fans help to recirculate and draw air towards roof mounted exhaust fans.

Controls Systems

The building does not have a centralized BMS control system. Boilers, rooftop units, infra-red heaters, and AC units are controlled either by wall thermostats or a thermostats mounted on the units themselves. A programmable wall-mounted thermostat controls the Trane RTU for the Senior Center air conditioning. Each infra-red heater has its own programmable thermostat. Occupancy sensors are installed in some rooms. No ECMs have been included which address the issue of instituting a modern BMS system, as building representatives have precluded this analysis from this report.

Domestic Hot Water Systems

Domestic hot water is generated by a gas-fired Bradford White Domestic DHW heater that has a capacity of 40,000 BTUH and holds 50 gallons. A storage tank stores an additional 100 gallons. Both tanks are located in the Boiler Room. DHW is used in rest room sinks throughout the building. An ECM is evaluated for replacing the existing water heater with a high efficiency condensing model.

Kitchen Equipment

The building does not have a full commercial kitchen; however there is one residential style kitchen in each of the two sections with residential microwave, electric range, refrigerator and other electrical appliances. No ECMs were included for kitchen equipment.

Plug Load

The Senior Center and Public Safety Building has computers, LCD monitors, copiers, smart boards, residential appliances (microwave, refrigerator), and printers which contribute to the plug load in the building. No ECMs evaluating the building plug loads is included.

Plumbing Systems

Plumbing systems include several toilet rooms and the two small kitchens. Toilet rooms are equipped with high flow water consumption fixtures—at the urinals, water closets, and lavatories. At this time building personnel are interested only in the replacement of lavatory aerators. An ECM that evaluates the replacement of the lavatory aerators is included.

Lighting Systems

The lighting within the Senior Center and Public Safety offices consists of 2x4 and 2x2 recessed and ceiling mounted troffers having 32W T8 fluorescent lamps with prismatic lenses. Several areas also contain recessed cans outfitted with compact fluorescent lamps. The Public Safety garage bay area is lit by pendant hung 8’ double fixtures with four 4’ long 32W T8 fluorescent lamps. Most interior lighting is manually controlled by wall switches.

Exterior lighting consists almost exclusively of 150W metal halide wall-pack lamps, and is controlled by timers.

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

3.0 UTILITIES

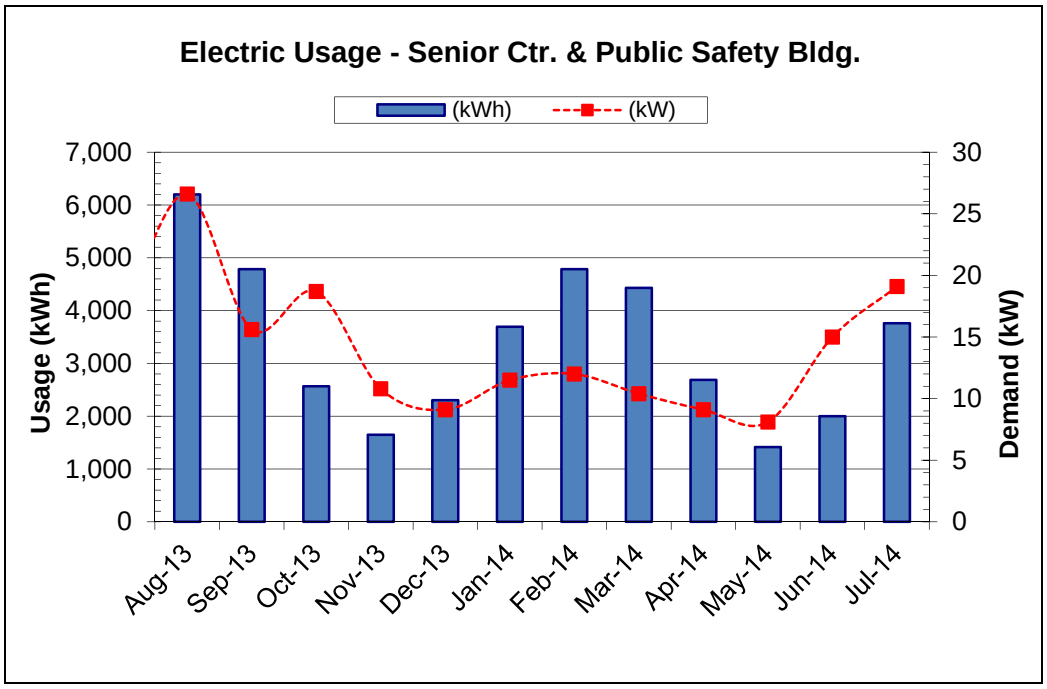
Utilities used by the building are delivered and supplied by the following utility companies:

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

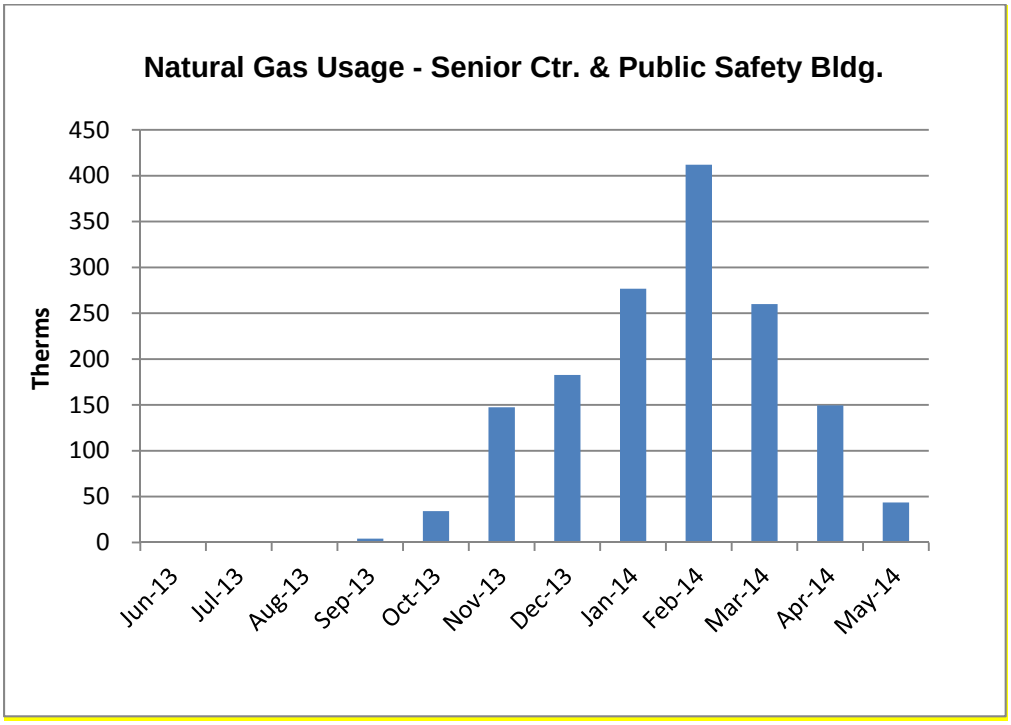
For the 12-month period ending in July 2014, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	40,283	kWh/yr.
Annual Cost	6,086	$
Blended Unit Rate	0.151	$/kWh
Supply Rate	0.133	$/kWh
Demand Rate	2.25	$/kW
Peak Demand	26.6	kW
Natural Gas		
Annual Usage	14,313	Therms/yr.
Annual Cost	13,479	$
Rate	0.942	$/therm
Water		
Annual Consumption	68,068	gallons/yr.
Annual Cost	628	$
Rate	0.009	$/gallon

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



The electrical usage for this building has peaks in the summer and winter with valleys in the spring and fall. Summer peaks occur during the maximum cooling season. The peaks during winter months which could be caused by electric heaters.



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

See Appendix A for utility analysis.

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

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	School Average Rate	NJ Average Rate	
Electricity	$/kWh	$0.15	$0.13	Y
Natural Gas	$/Therm	$0.94	$0.96	N

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

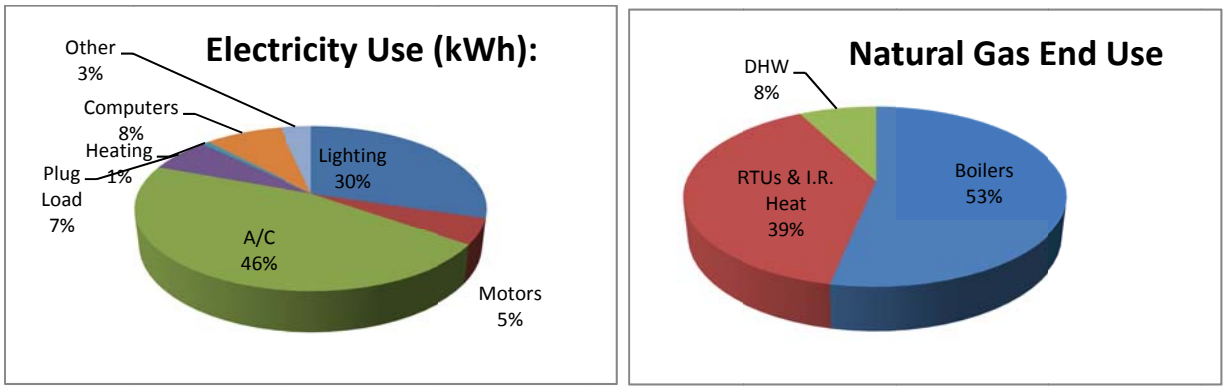
Additional information on selecting a third party energy supplier is available here:

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

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

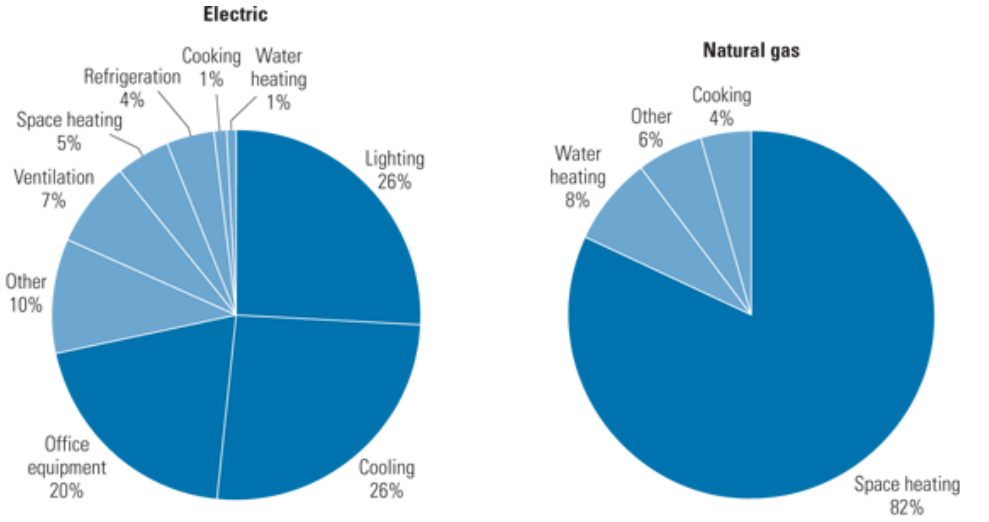
The charts below represent estimated utility end-use utility profiles for the building. The values used within the charts were estimated from a review of the utility analysis and the energy savings calculations.

Site End-Use Utility Profile



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

Typical End-Use Utility Profile for Commercial Buildings



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

4.0 BENCHMARKING

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

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

Building	Site EUI kBtu/ft^2/yr	Source EUI Btu/ft^2/yr	Energy Star Rating (1-100)
Senior Center & Public Safety Building	109.9	134.3	N/A

This type of building is ineligible for an Energy Star Rating. By implementing the measures discussed in this report, it is expected that the site and source EUIs can be further reduced.

5.0 ENERGY CONSERVATION MEASURES

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

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

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

Energy savings were quantified in the form of:

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

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

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

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

5.1 ECM-1 Replace Windows

Approximately 408 square feet of windows in the building are ill-fitting and are in general poor condition and can only provide average thermal resistance to heat transfer. Significant energy loss due to air infiltration occurs between the building and its surroundings. An assessment has been made which considers the installation of triple pane windows with aluminum frames.

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

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

ECM-1 Replace Windows

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
87,100	0	125	591	576	(0.8)	0	151.3	151.3

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

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

5.2 ECM-2 Install Window Film

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

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

ECM-2 Install Window Film

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
5,200	0	2,460	0	371	0.1	0	14.0	14.0

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

This measure is recommended.

5.3 ECM-3 Replace Roof and Add Insulation

Due to the age and general condition of the building, it is estimated that the existing insulation is R-13.

To calculate the savings, the heat losses through the roof assembly of the facility were found using the existing roof's R-value of 13 and bin weather data. The values were totaled to determine the existing annual energy losses. Heating and cooling energy loss values were then determined with a thermal resistance which included the additional R-17.0 foam insulation. The total proposed roof R-value with insulation is R- 30. Implementation of this ECM will entail installing 3" high density foam insulation in attic cavity to reduce heat transfer.

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

ECM-3 Replace Roof and Add Insulation

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
134,250	0	153	622	609	(0.9)	0	220.4	220.4

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

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

5.4 ECM-4 Replace Door Sweeps and Seals (service doors and overhead)

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

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

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

ECM-4 Replace Door Sweeps & Seals

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
2,074	0	194	215	232	0.1	0	8.9	8.9

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

This measure is recommended.

5.5 ECM-5 Add a High Efficiency Condensing Boiler

Much of the heat for the building is provided by two (2) identical Flex-Heat hot water boilers. These are estimated at 7-9 years old, with a heating capacity of approximately 750 MBH each, and operating at approximately 80-82% combustion efficiency. Discussions with maintenance personnel indicated that only one boiler is needed approximately 95% of the time.

It is recommended that one (1) high efficiency condensing boiler be added into the boiler room and piped into the existing hydronic piping. New modulating condensing gas boilers are available that operate at a minimal efficiency of 88%, and can operate as high as 96%, depending upon the outdoor air temperature. The new condensing boiler could be wall-mounted, providing a considerably smaller footprint than the existing Flex-heat boilers- an important consideration for this boiler room. The new boiler could then be used as the primary heating boiler, with the older boilers used as back-up for when additional heat is needed on the coldest days.

To implement this ECM, some localized piping and wiring would be needed. New dedicated boiler venting would also need to be installed either through the roof or sidewall. It is possible that asbestos abatement may need to be performed prior to any work and the cost for this is not included in the payback analysis.

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

ECM-5 Add a High Efficiency Condensing Boiler

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
24,134	0	0	254	239	(0.8)	300	101.0	99.8

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

This measure is recommended.

5.6 ECM-6 Replace (1) Packaged RTU with (2) High EER RTUs

The existing gas-fired Tempstar packaged rooftop unit provides heating, cooling and ventilation to two (2) spaces below: the Meeting Room and the Break Room. This unit is a single-zone constant volume RTU, with one supply duct and one return duct that drop down through the roof at a location several feet away from the unit. Once inside the building, the ductwork splits off to serve the two rooms. These rooms have significantly different utilizations. The Break Room is frequently used 24/7; the Meeting Room is used occasionally during weekdays only. Both rooms however are controlled by the same thermostat and are conditioned whether occupied or unoccupied.

It is recommended that the existing Tempstar unit be replaced by two small packaged rooftop units with higher EERs. The existing unit is approximately 15 fifteen years old and is nearing the end of its useful life. It is recommended that this unit be replaced with two new smaller models that will each operate at a higher energy efficiency ratio (EER). This ECM assesses the replacement of each of the RTUs in question and gives the resulting energy savings.

It is assumed in the performance of this calculation that the total combined capacity stays the same. The operating hours and number of units, however, are changed, and more accurately reflect the utilization of the spaces being served. The energy savings result from higher efficiency units over existing, and from reduced occupancy of the Meeting Rm.

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

ECM-6 Replace (1) Packaged RTU with (2) High EER RTUs

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
80,700	0	8,221	0	1,241	(0.7)	600	65	64.5

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

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

5.7 ECM-7 Install A/C Controller

Roughly 15% of the building is cooled by through-wall air conditioners which are not programmable and are sometimes left on when the building is un-occupied.

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

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

ECM-7 Install A/C Controller

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
600	0	1,610	0	243	3.1	0	2.5	2.5

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

This measure is recommended.

5.8 ECM-8 Demand Controlled Ventilation

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

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

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

ECM-8 Demand Controlled Ventilation

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
10,600	0	1,933	241	519	(0.3)	0	20.4	20.4

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

This measure is recommended.

5.9 ECM-9 Replace DHW Heater with a Condensing DHW Heater

Domestic hot water for the building is generated by a gas-fired DHW heater in combination with a storage tank.According to the U.S. Department of Energy, 2.5% of stored thermal capacity is lost every hour during DHW heater standby. In other words, stored hot water that is not being used loses heat unnecessarily to the surroundings.

Converting a standard natural gas DHW heater to instantaneous natural gas DHW heater will result in an annual energy savings. The new water heater requires exhaust venting that will necessitate some modifications to the existing boiler room.

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

ECM-9 Replace DHW Heater with a 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
9,438	0	0	472	445	(0.3)	300	21.2	20.5

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

This measure is recommended.

5.10 ECM-10 Install Low Flow Plumbing Fixtures

Most of the plumbing fixtures in this building are older high flow fixtures. Building personnel, however, are not interested in the replacement of existing toilet and urinal fixtures at this time—they are only interested in the possible replacement of lavatory fixtures. The water savings associated from replacing existing high flow lavatory aerators with low-flow aerators was calculated by taking the difference of the annual water usage for the proposed and base case. The basis of this calculation is the estimate usage of each fixture, gallons per use, and number of fixtures.

Replacing the existing aerators in the restrooms with 0.5 gpm aerators will conserve water, which will result in lower annual water and sewer charges.

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

ECM-10 Install Low Flow Plumbing Fixtures

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Water	Total				
$	kW	kWh	Therms	kGal	$		$	Years	Years
85	0	0	333	1	323	93.7	0	0.3	0.3

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

These measures are recommended.

5.11.1 ECM-L1 Lighting Replacement / Upgrades

The lighting within the Senior Center and Public Safety offices consists of 2x4 and 2x2 recessed and ceiling mounted troffers having 32W T8 fluorescent lamps with prismatic lenses. Several areas also contain recessed cans outfitted with compact fluorescent lamps. The Public Safety garage bay area is lit by pendant hung 8' double fixtures with four 4' long 32W T8 fluorescent lamps. Most interior lighting is manually controlled by wall switches.

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
30,480	3.8	12,913	0	1,821	(0.3)	6,195	16.7	13.3

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

This measure is not recommended in lieu of ECM L3.

5.11.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

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

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

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

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
898	0	4,215	0	561	6.1	140	1.6	1.4

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

This measure is not recommended in lieu of ECM L3.

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

This measure is a combination of ECM-L1 and ECM-L2; recommending replace/upgrade the current lighting fixtures to more efficient ones and installing occupancy sensors on the new lights. Interactive effects of the higher efficiency lights and occupancy sensors lead the energy and cost savings for this measure to not be cumulative or equivalent to the sum of replacing the lighting fixtures alone and installing occupancy sensors without the lighting upgrade. The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
31,378	3.8	15,250	0	2,132	(0.2)	6,335	14.7	11.7

* 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.

5.12 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:

- Clean Window A/C filters before each season
- Set computers monitors to turn off and computers to sleep mode when not in use
- Look for the ENERGY STAR® label when purchasing Window AC units or Kitchen Appliances
- Disconnect unnecessary or unused small appliances and electronics when not in use to reduce phantom loads

- Train staff to turn off lights and set HVAC temperatures to minimum levels when rooms are unoccupied
- Develop an Energy Master Plan to measure and track energy performance

6.0 PROJECT INCENTIVES

6.1 Incentives Overview

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

6.1.1 New Jersey Smart Start Program

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

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

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

Smart Start also offers an alternative Custom Measure Incentive plan that is calculated based on the amount of gas/ electricity saved per year but has minimum requirements for internal rate of return of >10% and minimum annual energy savings of 75,000 kWh or 1,500 Therms.

Additionally, the Custom Measure approach may require building modelling to demonstrate ASHRAE compliance and Measurement and Verification to validate the savings.

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

6.1.2 Direct Install Program

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

Direct Install is funded through New Jersey's Clean Energy Program and is designed to provide capital for building energy upgrade projects to fast track implementation. The

program will pay up to 70% of the costs for lighting, HVAC, motors, refrigeration, and other equipment upgrades with higher efficiency alternatives. If a building is eligible for this funding, the Direct Install Program can reduce the implementation cost of energy conservation projects.

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

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

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

Refer to Appendix D for more information on this program.

6.1.3 New Jersey Pay For Performance Program (P4P)

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

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

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

The standard incentive pays $0.10 per square foot, up to a maximum of $50,000, not to exceed 50% of facility annual energy cost, paid after approval of application. For building audits funded by the New Jersey Board of Public Utilities, which receive an initial 75%

incentive toward performance of the energy audit, facilities are only eligible for an additional $0.05 per square foot, up to a maximum of $25,000, rather than the standard incentive noted above. The ERP must be completed by a Certified Energy Manager (CEM) and submitted along with the project application.

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

Electric

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

Gas

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

Incentive cap: 25% of total project cost

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

Electric

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

Gas

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

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

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

6.1.4 Energy Savings Improvement Plan

The Energy Savings Improvement Program (ESIP) allows government agencies to make energy related improvements to their facilities and pay for the costs using the value of

energy savings that result from the improvements. Under the recently enacted Chapter 4 of the Laws of 2009 (the law), the ESIP provides all government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources.

ESIP allows local units to use “energy savings obligations” (ESO) to pay for the capital costs of energy improvements to their facilities. ESIP loans have a maximum loan term of 15 year. ESOs are not considered “new general obligation debt” of a local unit and do not count against debt limits or require voter approval. They may be issued as refunding bonds or leases. Savings generated from the installation of energy conservation measures pay the principal of and interest on the bonds; for that reason, the debt service created by the ESOs is not paid from the debt service fund, but is paid from the general fund.

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

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

6.1.5 Renewable Energy Incentive Program

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

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

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

7.0 ALTERNATIVE ENERGY SCREENING EVALUATION

7.1 Solar

7.1.1 Photovoltaic Rooftop Solar Power Generation

The building was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. However the building currently has a solar PV system and there is minimal available space for additional PV panels.

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.

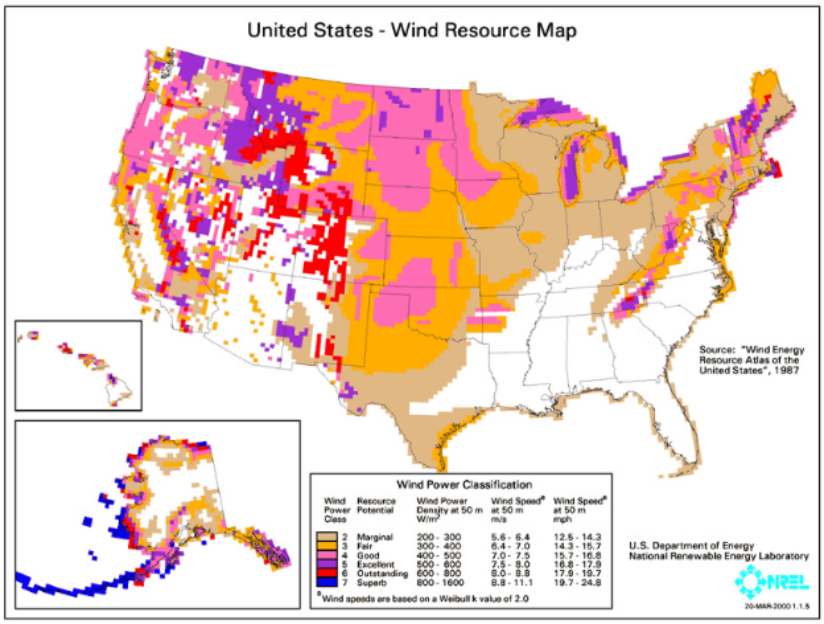
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping). 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 school is very small. Installing a solar domestic hot water system is not recommended due to the limited amount of domestic hot water presently consumed by the school.

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

7.2 Wind Powered Turbines

Wind power is the conversion of kinetic energy from wind into mechanical power that is used to drive a generator which creates electricity by means of a wind turbine. A wind turbine consists of rotor and blades connected to a gearbox and generator that are mounted onto a tower. Newer wind turbines also use advanced technology to generate electricity at a variety of frequencies depending on the wind speed, convert it to DC and then back to AC before sending it to the grid. Wind turbines range from 50 – 750 kW for utility scale turbines down to below 50 kW for residential use. On a scale of 1 (the lowest) to 7 (the highest), Class 3 and above (wind speeds of 13 mph or greater) are generally considered "good wind resource" according to the Wind Energy Development

Programmatic EIS Information Center hosted by the Bureau of Land Management. According to the map below, published by NREL, Newark, NJ is classified as Class 1 at 50m, meaning the city would not be a good candidate for wind power.



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

7.3 Combined Heat and Power Plant

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

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

This measure is not recommended due to the absence of year-round thermal loads which are needed for efficiency CHP operation.

7.4 Demand Response Curtailment

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

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

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

Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
26.6	6.9	13.3	N	N

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

8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for the Senior Center & Public Safety Building.

The following projects should be considered for implementation:

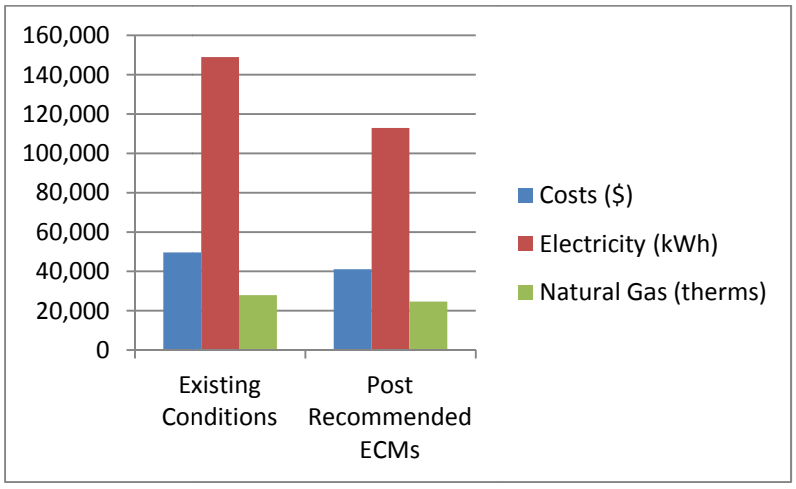
- Install Window A/C Controller
- Install Door Sweeps and Seals
- Lighting Replacements with Controls (Occupancy Sensors)

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

Electric Savings (kWh)	Natural Gas Savings (therms)	Total Savings ($)	Payback (years)
19,818	1,514	4,287	19.4

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	19,565	15,278	22%
Electricity (kWh)	40,283	20,465	49%
Natural Gas (therms)	14,313	12,799	11%
Site EUI (kbtu/SF/Yr)	104.6	90.0	



Next Steps: This energy audit has identified several areas of potential energy savings. Little Ferry can use this information to pursue incentives offered by the NJBPU's NJ

Clean Energy Program. Additional meetings will be scheduled with the Borough of Little Ferry staff members to review possible options.

APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

Senior Center & Public Safety Building
Main & Pickens St., Little Ferry, NJ 07643

Annual Utilities

12-month Summary

Electric		
Annual Usage	40,283	kWh/yr
Annual Cost	6,086	$
Blended Rate	0.151	$/kWh
Consumption Rate	0.133	$/kWh
Demand Rate	2.25	$/kW
Peak Demand	26.6	kW
Min. Demand	6.9	kW
Avg. Demand	13.3	kW
Natural Gas		
Annual Usage	14,313	Therms/yr
Annual Cost	13,479	$
Rate	0.942	$/therm
Water		
Annual Usage	68,068	gallons/yr
Annual Cost	628	$
Rate	0.009	$/gallon

Senior Center & Public Safety Building
Main & Pickens St., Little Ferry, NJ 07643

Utility Bills: Account Numbers

Account Number	Building	Location	Type	Notes
67-226-028-14	Senior Center & Public Safety Building	Main & Pickens St., Little Ferry, NJ 07	Electricity	
67-226-028-14	Senior Center & Public Safety Building	Main & Pickens St., Little Ferry, NJ 07	Natural Gas	
10002982412222	Senior Center & Public Safety Building	Main & Pickens St., Little Ferry, NJ 07	Water	

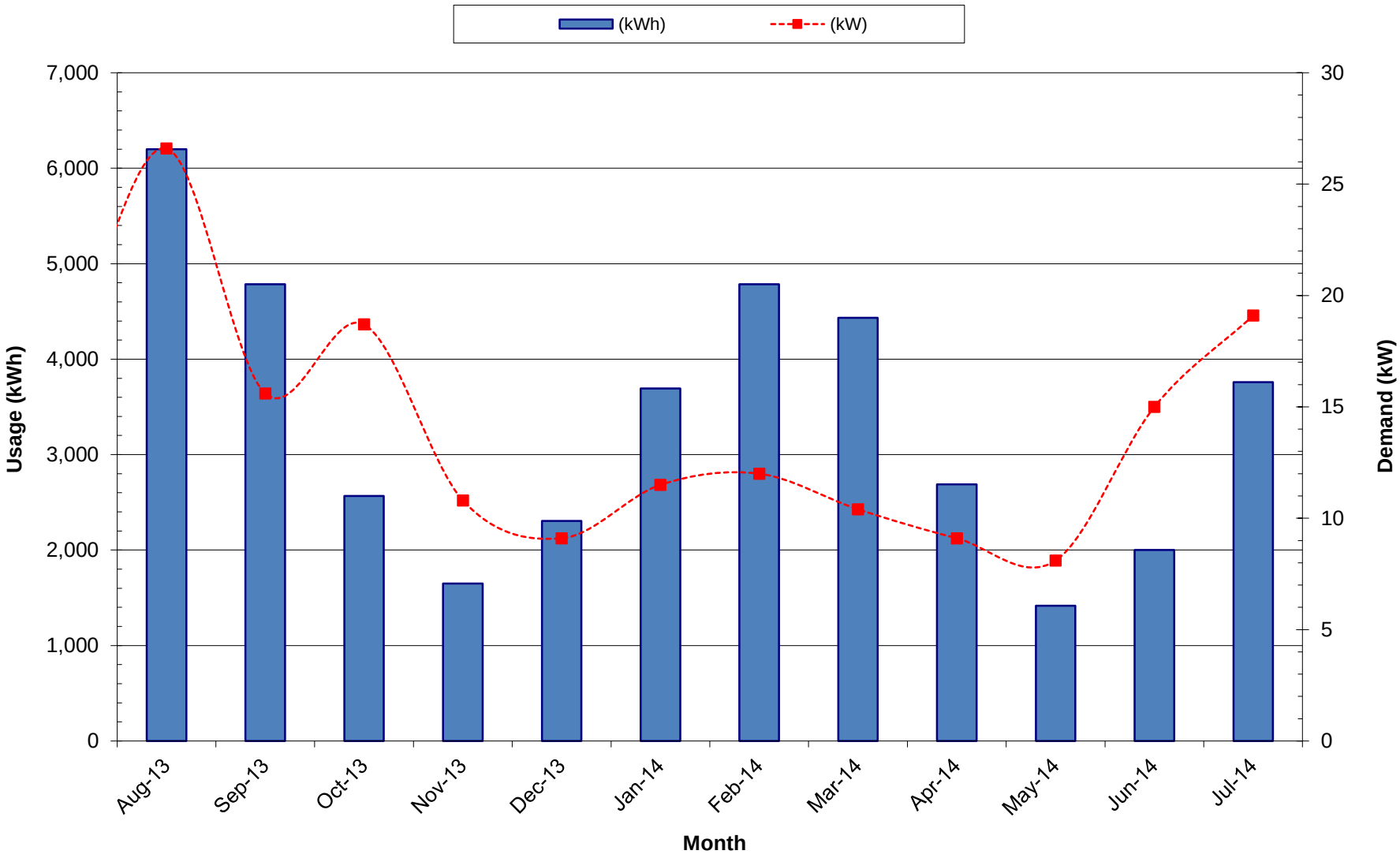
Senior Center & Public Safety Building
Main & Pickens St., Little Ferry, NJ 07643

For Service at: **Senior Center & Public Safety Building**
Account No.: **67-226-028-14** **Delivery -** PSE&G
Meter No.: **Supplier -**
Electric Service

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	Consump. (kWh)	Demand (kW)	Delivery ($)	Supplier ($)	Total ($)	Consumption ($)	Demand ($)	Blended Rate ($/kWh)	Consumption ($/kWh)	Demand ($/kW)
August-12	6,189	25.40			1,133.89	1,024.03	109.86	0.18	0.17	4.33
September-12	4,773	14.40			776.15	713.37	62.78	0.16	0.15	4.36
October-12	2,556	17.50			325.61	249.57	76.04	0.13	0.10	4.35
November-12	1,639	9.60			246.65	204.42	42.23	0.15	0.12	4.40
December-12	2,293	7.90			325.16	290.21	34.95	0.14	0.13	4.42
January-13	3,683	10.30			572.90	527.68	45.22	0.16	0.14	4.39
February-13	4,200	10.80			645.16	597.79	47.37	0.15	0.14	4.39
March-13	4,421	9.20			579.28	538.76	40.52	0.13	0.12	4.40
April-13	2,772	9.3			341.50	301.69	39.81	0.12	0.11	4.28
May-13	1,405	6.9			217.74	188.20	29.54	0.15	0.13	4.28
June-13	1,988	13.8			357.65	298.57	59.08	0.18	0.15	4.28
July-13	3,907	17.9			494.97	418.35	76.62	0.13	0.11	4.28
August-13	6,200	26.6			1,144.89	1,031.03	113.86	0.18	0.17	4.28
September-13	4,784	15.6			787.15	720.37	66.78	0.16	0.15	4.28
October-13	2,567	18.7			336.61	256.57	80.04	0.13	0.10	4.28
November-13	1,650	10.8			257.65	211.42	46.23	0.16	0.13	4.28
December-13	2,304	9.1			336.16	297.21	38.95	0.15	0.13	4.28
January-14	3,694	11.5			583.90	534.68	49.22	0.16	0.14	4.28
February-14	4,786	12			656.16	604.79	51.37	0.14	0.13	4.28
March-14	4,432	10.4			590.28	545.76	44.52	0.13	0.12	4.28
April-14	2,689	9.1			310.53	271.58	38.95	0.12	0.10	4.28
May-14	1,417	8.1			221.74	185.20	36.54	0.16	0.13	4.51
June-14	2,000	15			361.65	295.57	66.08	0.18	0.15	4.41
July-14	3,760	19.1			498.97	415.35	83.62	0.13	0.11	4.38
Total (All)	**80,109**	**26.60**	**$0.00**	**$0.00**	**$12,102.35**	**$10,722.17**	**$1,380.18**	**$0.15**	**$0.13**	**$4.33**
Total (last 12-months)	**40,283**	**26.60**	**$0.00**	**$0.00**	**$6,085.69**	**$5,369.53**	**$716.16**	**$0.15**	**$0.13**	**$2.25**
Notes	1	2	3	4	5	6	7	8	9	10

1.) Number of kWh of electric energy used per month
2.) Number of kW of power measured
3.) Electric charges from Delivery provider
4.) Electric charges from Supply provider
5.) Total charges (Delivery + Supplier)
6.) Charges based on the number of kWh of electric energy used
7.) Charges based on the number of kW of power measured
8.) Total Charges ($) / Consumption (kWh)
9.) Consumption Charges ($) / Consumption (kWh)
10.) Demand Charges ($) / Demand (kW)

Electric Usage - Senior Center & Public Safety Bldg.

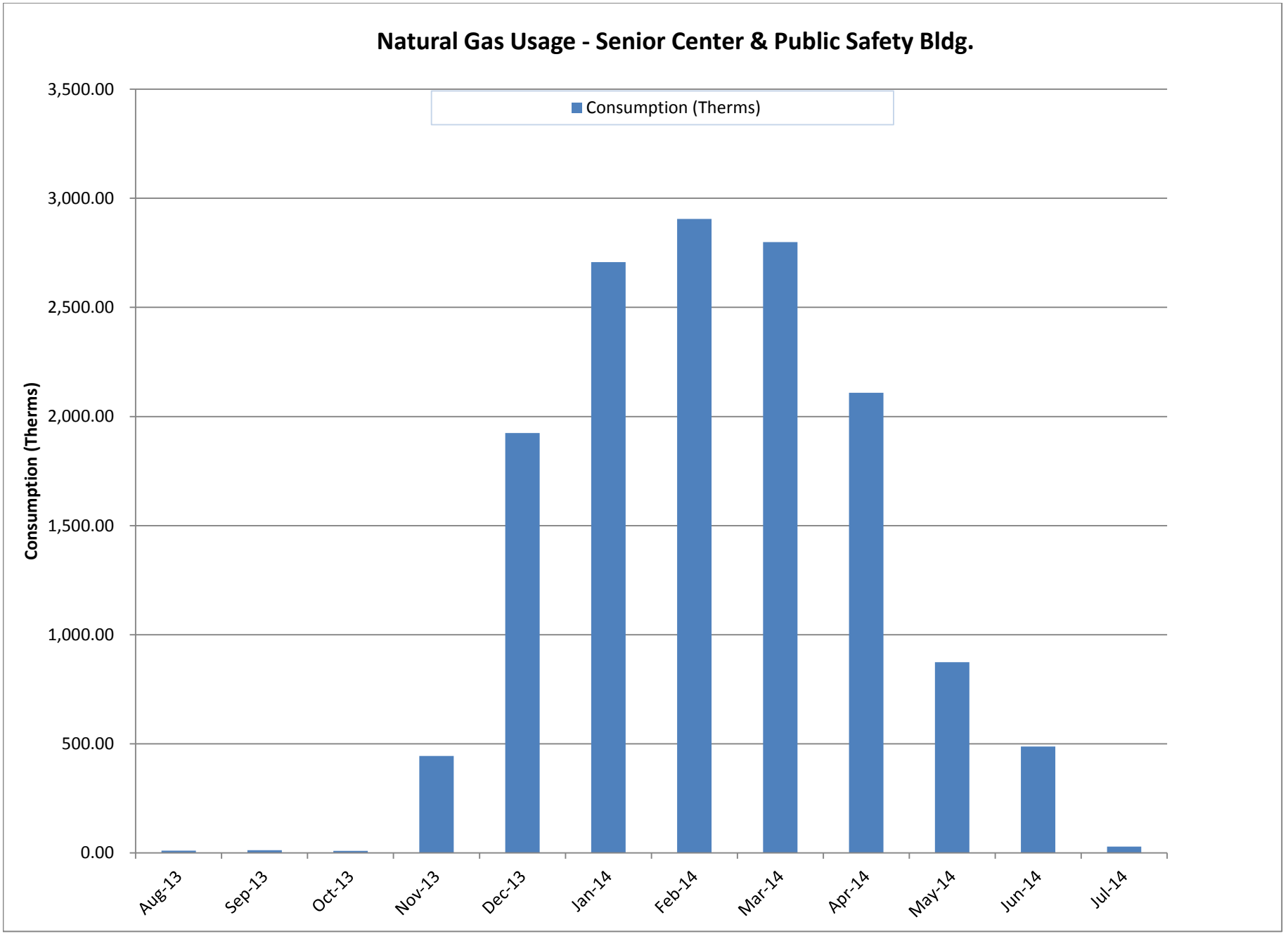


Utility Data -Senior Center-Public Safety Building
Electric Graph

Senior Center & Public Safety Building
Main & Pickens St., Little Ferry, NJ 07643

For Service at: **Senior Center & Public Safety Building**
Account No.: **67-226-028-14**
Meter No:
Natural Gas Service **Delivery -** **PSE&G**
Supplier - **Hess / Direct Energy**

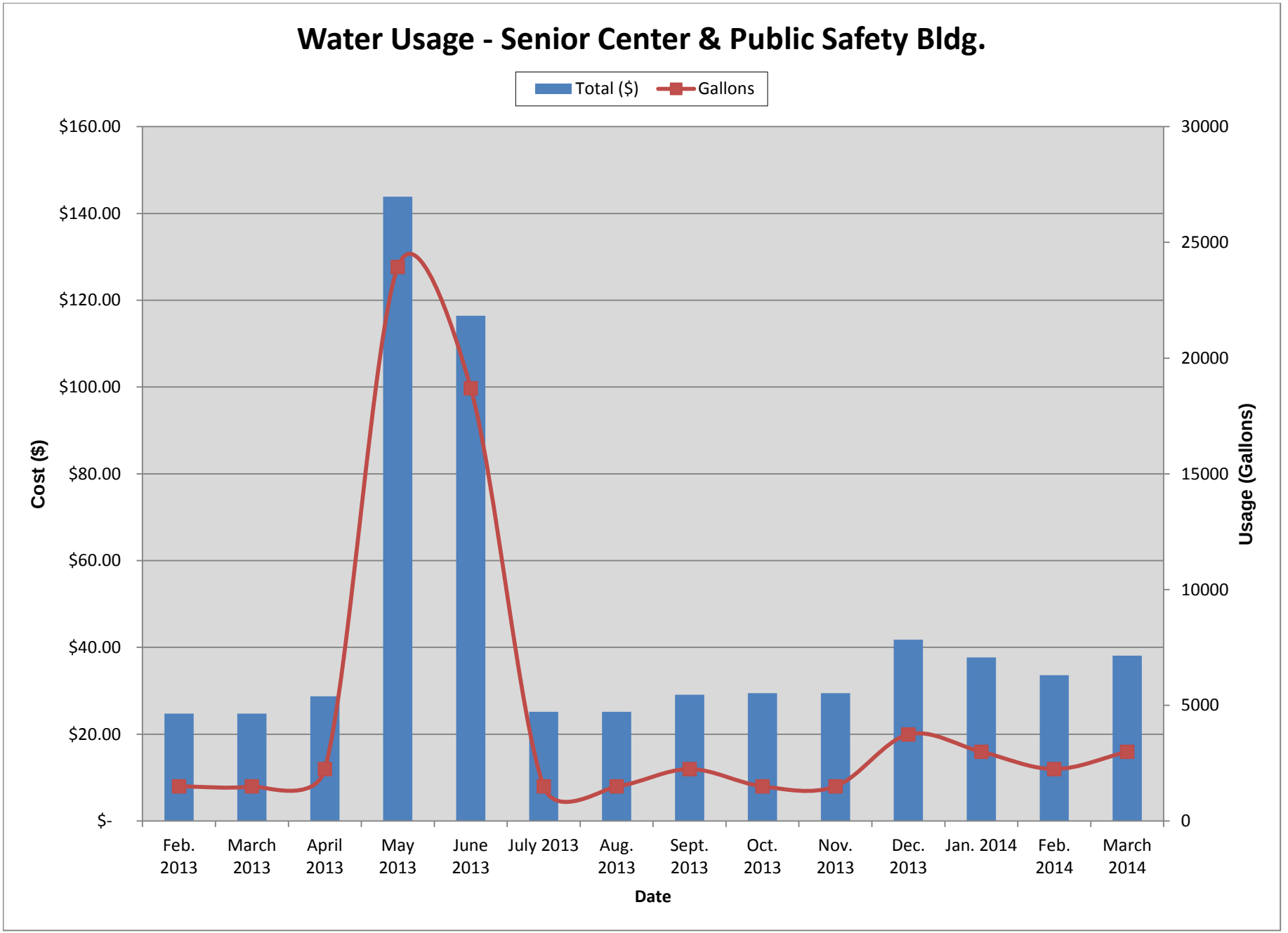
		Charges			Unit Costs		
Month	**Consumption (Therms)**	**Delivery ($)**	**Supply ($)**	**Total ($)**	**Delivery ($/Therm)**	**Supply ($/Therm)**	**Total ($/Therm)**
August-12	8.63		$ 13.90	$ 13.90			$ 1.611
September-12	12.50		$ 14.63	$ 14.63			$ 1.170
October-12	17.94		$ 13.53	$ 13.53			$ 0.754
November-12	333.00		$ 188.17	$ 188.17			$ 0.565
December-12	1,807.07		$ 845.10	$ 845.10			$ 0.468
January-13	2,400.00	$ 1,048.36	$ 1,188.96	$ 2,237.32			$ 0.932
February-13	2,700.00	$ 1,215.28	$ 1,220.10	$ 2,435.38			$ 0.902
March-13	2,550.00	$ 1,208.17	$ 1,184.79	$ 2,392.96			$ 0.938
April-13	1,952.35	$ 1,013.54	$ 671.86	$ 1,685.40			$ 0.863
May-13	864.53	$ 451.94	$ 303.79	$ 755.73			$ 0.874
June-13	478.29	$ 250.03	$ 173.34	$ 423.37			$ 0.885
July-13	20.07	$ -	$ 18.13	$ 18.13			$ 0.903
August-13	10.63	$ 5.57	$ 14.90	$ 20.47			$ 1.926
September-13	12.78	$ 6.71	$ 15.63	$ 22.34			$ 1.749
October-13	9.57	$ 4.99	$ 14.53	$ 19.52			$ 2.039
November-13	444.57	$ 232.39	$ 199.17	$ 431.56			$ 0.971
December-13	1,924.45	$ 1,005.98	$ 856.10	$ 1,862.08			$ 0.968
January-14	2,707.78	$ 1,415.42	$ 1,199.96	$ 2,615.38			$ 0.966
February-14	2,905.00	$ 1,486.57	$ 1,231.10	$ 2,717.67			$ 0.936
March-14	2,799.37	$ 1,463.38	$ 1,195.79	$ 2,659.17			$ 0.950
April-14	2,108.64	$ 1,102.25	$ 669.30	$ 1,771.55			$ 0.840
May-14	873.53	$ 608.03	$ 310.79	$ 918.82			$ 1.052
June-14	487.29	$ 228.75	$ 180.34	$ 409.09			$ 0.840
July-14	29.07	$ 9.83	$ 21.13	$ 30.96			$ 1.065
Total (12 months)	**14,313**	**7,570**		**$ 13,478.61**			**$ 0.942**


Natural Gas Usage - Senior Center & Public Safety Bldg.
Consumption (Therms)
Consumption (Therms)
3,500.00
3,000.00
2,500.00
2,000.00
1,500.00
1,000.00
500.00
0.00
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Jul-14

Senior Center & Public Safety Building
Main & Pickens St., Little Ferry, NJ 07643

For Service at: **87 Main Street**
Account No.: **10002982412222**
Meter No.: **88411842**
Water & Sewer Service **Delivery -** **United Water**
Supplier - **United Water**

Month	Total ($)	Gallons	$/Gallon
Feb. 2013	$ 24.75	1496	$ 0.017
March 2013	$ 24.75	1496	$ 0.017
April 2013	$ 28.72	2244	$ 0.013
May 2013	$ 143.86	23936	$ 0.006
June 2013	$ 116.41	18700	$ 0.006
July 2013	$ 25.14	1496	$ 0.017
Aug. 2013	$ 25.14	1496	$ 0.017
Sept. 2013	$ 29.11	2244	$ 0.013
Oct. 2013	$ 29.47	1496	$ 0.020
Nov. 2013	$ 29.47	1496	$ 0.020
Dec. 2013	$ 41.80	3740	$ 0.011
Jan. 2014	$ 37.69	2992	$ 0.013
Feb. 2014	$ 33.58	2244	$ 0.015
March 2014	$ 38.08	2992	$ 0.013
Total	**$ 627.97**	**68068**	**0.009**


Water Usage - Senior Center & Public Safety Bldg.
Total ($)
Gallons
$160.00
$140.00
$120.00
$100.00
$80.00
$60.00
$40.00
$20.00
$-
Cost ($)
30000
25000
20000
15000
10000
5000
0
Usage (Gallons)
Feb. 2013
March 2013
April 2013
May 2013
June 2013
July 2013
Aug. 2013
Sept. 2013
Oct. 2013
Nov. 2013
Dec. 2013
Jan. 2014
Feb. 2014
March 2014
Date

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

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

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

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

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

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

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

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

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

Back to the main supplier page

PSE&G GAS SERVICE TERRITORY
Last Updated: 9/04/14

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

Supplier	Telephone & Web Site	*Customer Class
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**
Amerigreen Energy, Inc. **333 Sylvan Avenue Suite 206** **Englewood Cliffs, NJ 07632**	(888)559-4567 www.amerigreen.com	**R/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**
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**
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 http://www.business.directenergy.com/	**R** **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 Services, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	(888) 925-9115 www.directenergy.com	**R** **ACTIVE**
Direct Energy Small Business, LLC (fka Hess Small Business Services, LLC) One Hess Plaza Woodbridge, NJ 07095	(888) 464-4377 http://www.business.directenergy.com/	**C/I** **ACTIVE**

Gateway Energy Services Corp. 120 Wood Avenue Suite 611 Iselin, NJ 08830	(866) 348-4193 www.gesc.com	**R/C** **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	**C/I** **ACTIVE**
Great Eastern Energy 116 Village Blvd., Suite 200 Princeton, NJ 08540	888-651-4121 www.greateastern.com	**C/I** **ACTIVE**
Greenlight Energy 330 Hudson Street, Suite 4 Hoboken, NJ 07030	718-204-7467 www.greenlightenergy.us	**C** **ACTIVE**
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 07446	877- Hudson 9 www.hudsonenergyservices.com	**C** **ACTIVE**
IDT Energy, Inc. 550 Broad Street Newark, NJ 07102	877-887-6866 www.idtenergy.com	**R/C** **ACTIVE**
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 33 Wood Avenue South, Suite 610	(800) 536-0151 www.integrysenergy.com	**C/I** **ACTIVE**

Iselin, NJ 08830		
Jsynergy LLC 445 Cental Ave. Suite 204 Cedarhurst, NY 11516	(516) 331-2020 www.Jsnergyllc.com	**R/C/I** **ACTIVE**
Keil & Sons, Inc. **d/b/a Systrum Energy** 1 Bergen Blvd. Fairview, NJ 07022	1-877-797-8786 www.systrumenergy.com	**R** **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** **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) 535-6340 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**
PPL EnergyPlus Retail, LLC Shrewsbury Executive Offices 788 Shrewsbury Avenue, Suite 220 Tinton Falls, NJ 07724	(732) 741-0505 – 2000 www.pplenergyplus.com	**C/I** **ACTIVE**
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**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	(800) 695-0666 www.sjnaturalgas.com	**C** **ACTIVE**
South Jersey Energy Company 1 South Jersey Plaza, Route 54 Folsom, NJ 08037	800-266-6020 www.southjerseyenergy.com	**R/C/I** **ACTIVE**
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**

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 Bridgeton, NJ 08302	800-557-1121 www.woodruffenergy.com	**R/C/I** **ACTIVE**
Woodruff Energy US LLC 73 Water Street, P.O. Box 777 Bridgeton, NJ 08302	856-455-1111 800-557-1121 www.woodruffenergy.com	**C/I** **ACTIVE**
XOOM Energy New Jersey, LLC 744 Broad Street. 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**

Back to main supplier information page

APPENDIX B

Equipment Inventory

Borough of Little Ferry
CHA Project# 28948
Senior Center-Public Safety Building

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size	Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
AC-1	1	N/A	N/A	N/A	Thru-wall AC unit	~1 ton	N/A	1st floor office (inaccessible)	1st floor office (inaccessible)	~2003	4	
IR-1 thru IR-4	4	Reznor	Ambi-Rad	N/A	Gas-fired infra-red heater	N/A	N/A	Public Safety Garage ceiling	Public Safety Garage	~2006	14	
AC-2	1	Comfort-Aire	N/A	N/A	Thru-wall AC unit	~1 ton	N/A	1st floor office	1st floor office	~2008	9	
AC-3	1	Comfort-Aire	N/A	N/A	Thru-wall AC unit	~1 ton	N/A	1st floor office	1st floor office	~2008	9	
UH-1	1	Sterling	N/A	N/A	Hydronic unit heater	N/A	N/A	1st floor back room	1st floor back room	~2000	10	
UH-2	1	Sterling	N/A	N/A	Hydronic unit heater	N/A	N/A	1st floor back room	1st floor back room	~2000	10	
RTU-1	1	Tempstar	N/A	N/A	Gas fired heating and DX cooling unit	~5 tons	N/A	Roof	Meeting Rm and Break Rm	~2000	1	
RTU-2	1	Trane	TSC120F3R0A030..0D	122913294L	DX air conditioning unit	10 tons	10.2 EER	Roof	Senior Center	2012	13	
B-1	1	Flex-Heat	PB	N/A	Hot Water Boiler	~750 MBH	80%	Boiler Rm	Building	~2006	17	
B-2	1	Flex-Heat	PB	N/A	Hot Water Boiler	~750 MBH	80%	Boiler Rm	Building	~2006	17	
DHW-1	1	Bradford White	M15036FBN	JH16952143	DHW Heater	40,000 BTUH / 50 gallons	N/A	Boiler Rm	Building	2012	13	
DHW Storage	1	Nat'l BD	Amtrol	77-1205	DHW Storage	100 gallons	N/A	Boiler Rm	Building	1977	10	
Circ. pump	1	Taco	0010-F3	N/A	Hydronic circulator pump	1/8 HP	N/A	Boiler Rm	Building	~2006	12	

Energy Audit of Senior Center / Public Safety Building
CHA Project No. 28948
Existing Lighting & Audit Input

Cost of Electricity: **$0.133** **$/kWh**
$2.25 **$/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
40LED	Main Room	General Common	28	T 32 R F 2 (ELE)	F42LL	60	1.68	SW	2912	4,892	SW	
40LED	Kitchen	Cafeteria	2	T 32 R F 2 (ELE)	F42LL	60	0.12	OCC	1600	192	OCC	
40LED	Front Corridor	Hallways	3	T 32 R F 2 (ELE)	F42LL	60	0.18	Breaker	2280	410	Breaker	
40LED	Front Office	Offices	3	T 32 R F 2 (ELE)	F42LL	60	0.18	SW	2400	432	None	
254LED	Storage area	Storage/Janitor	1	CFQ26/2	CFQ26/2	66	0.07	SW	500	33	None	
227LED	Exterior wallpack	Outdoor Lighting	3	70 W MH Wall Pack	MH70/1	95	0.29	SW	4368	1,245	None	
55LED	Corridor	Hallways	2	2T 17 R F 3 (ELE)	F23ILL	47	0.09	SW	2280	214	None	
40LED	Toilet rooms (2)	Restroom w/ OCC	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	1000	240	None	
40LED	Main Garage Area	Garage	24	T 32 R F 2 (ELE)	F42LL	60	1.44	SW	5000	7,200	None	
40LED	Main Garage Area	Garage	4	T 32 R F 2 (ELE)	F42LL	60	0.24	SW	5000	1,200	None	
55LED	Toilet rooms	Restroom w/ OCC	1	2T 17 R F 3 (ELE)	F23ILL	47	0.05	OCC	1000	47	None	
198LED	Toilet room	Restroom w/ OCC	1	2T 17 R F 2 (ELE)	F22LL	31	0.03	OCC	1000	31	None	
35LED	Offices	Offices	7	T 32 R F 3 (ELE)	F43ILL/2	90	0.63	OCC	2400	1,512	None	
55LED	Meeting Room	Conference	6	2T 17 R F 3 (ELE)	F23ILL	47	0.28	SW	1200	338	OCC	
97	Break Room / Lounge	Break/Lunch Rooms	8	EP 13 R CF 2	CFQ13/2-L	28	0.22	SW	3102.5	695	OCC	
41LED	Break Room / Lounge	Break/Lunch Rooms	6	1B 40 R F 2 (MAG)	F42SS	94	0.56	SW	3102.5	1,750	OCC	
55LED	Main Garage Area	Garage	3	2T 17 R F 3 (ELE)	F23ILL	47	0.14	SW	5000	705	None	
40LED	Boiler Room	Boiler Room	2	T 32 R F 2 (ELE)	F42LL	60	0.12	SW	1820	218	None	
40LED	Large Storage area	Storage/Janitor	8	T 32 R F 2 (ELE)	F42LL	60	0.48	SW	500	240	None	
227LED	Exterior wallpack	Outdoor Lighting	11	70 W MH Wall Pack	MH70/1	95	1.05	SW	4368	4,565	None	
	Total		**127**				**8.09**			**26,160**		

APPENDIX C

ECM Calculations

Borough of Little Ferry
CHA Project Number: 28948

Rate of Discount (used for NPV) 3.0%

Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
$ 0.151	$/kWh blended		0.000420205	15,000	Electric	Natural Gas	Fuel Oil
$ 0.133	$/kWh supply	40,283	0.000420205		$ 6,086	$ 13,479	
$ 2.25	$/kW	98.4	0				
$ 0.94	$/Therm	14,313	0.00533471				
$ 9.00	$/kgals	68	0				
	$/Gal						

Senior Center & Public Safety Building

Recommend? Y or N		Item	Savings kW	kWh	therms	No. 2 Oil gal	Water kgal	$	Cost	Simple Payback	Life Expectancy	Equivalent CO_2 (Metric tons)	NJ Smart Start Incentives	Direct Install Eligible (Y/N)	Payback w/ Incentives	Simple Projected Lifetime Savings kW	kWh	therms	kgal/yr	$	ROI	NPV	IRR
N	ECM-1	Window Replacement	0.0	125	591	0	0	576	$ 87,100	151.3	25.0	3.2		N	151.3	0.0	3,136	14,774	0	$ 14,390	(0.8)	($77,077)	-10.8%
Y	ECM-2	Add Window Film	0.0	2,460	0	0	0	371	$ 5,200	14.0	15.0	1.0		N	14.0	0.0	36,903	0	0	$ 5,572	0.1	($765)	0.9%
N	ECM-3	Replace Roof and Insulate	0.0	153	622	0	0	609	$ 134,250	220.4	25.0	3.4	$ -	N	220.4	0.0	3,836	15,553	0	$ 15,230	(0.9)	($123,642)	-12.6%
Y	ECM-4	Door Sweeps and Seals	0.0	194	215	0	0	232	$ 2,074	8.9	10.0	1.2		N	8.9	0.0	1,941	2,152	0	$ 2,320	0.1	($95)	2.1%
Y	ECM-5	Add Condensing Boiler	0.0	0	254	0	0	239	$ 24,134	101.0	25.0	1.4	$ 300	N	99.8	0.0	0	6,339	0	$ 5,971	(0.8)	($19,675)	-8.7%
N	ECM-6	Replace (1) RTU with (2) RTUs	0.0	8,221	0	0	0	1,241	$ 80,700	65.0	20.0	3.5	$ 600	N	64.5	0.0	164,428	0	0	$ 24,829	(0.7)	($61,631)	-9.3%
Y	ECM-7	Air Conditioner Controllers	0.0	1,610	0	0	0	243	$ 600	2.5	10.0	0.7		N	2.5	0.0	16,097	0	0	$ 2,431	3.1	$1,473	39.0%
Y	ECM-8	Demand Controlled Ventilation	0.0	1,933	241	0	0	519	$ 10,600	20.4	15.0	2.1		N	20.4	0.0	28,998	3,608	0	$ 7,778	(0.3)	($4,410)	-3.6%
Y	ECM-9	Replace DHW Heater with Condensing	0.0	0	472	0	0	445	$ 9,438	21.2	15.0	2.5	$ 300	N	20.5	0.0	0	7,087	0	$ 6,676	(0.3)	($3,825)	-3.7%
Y	ECM-10	Install Low Flow Plumbing Fixtures	0.0	0	333	0	1	323	$ 85	0.3	25.0	1.8		N	0.3	0.0	0	8,317	27	$ 8,074	93.7	$5,539	378.9%
N	ECM-L1	Lighting Replacements / Upgrades	3.8	12,913	0	0	0	1,821	$ 30,480	16.7	10.0	5.4	$ 2,085	N	15.6	38.0	129,130	0	0	$ 20,525	(0.3)	($12,862)	-7.4%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	4,215	0	0	0	182	$ 513	2.8	10.0	1.8	$ 80	N	2.4	0.0	42,150	0	0	$ 6,365	11.4	$1,119	40.6%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	3.8	13,621	0	0	0	1,915	$ 30,993	16.2	10.0	5.7	$ 2,165	N	15.1	38.0	136,210	0	0	$ 21,594	(0.3)	($12,493)	-6.8%
		Total (Not Including ECMs L1, L2)	**3.8**	**20,097**	**2,727**	**0**	**1**	**$ 5,472**	**$ 304,474**	**55.6**	**15.6**	**23**	**$ 2,765**		**55.1**	**38**	**220,149**	**27,503**	**27**	**$ 60,416**	**(0.8)**	**($236,388)**	**-13.1%**
		Recommended Measures (highlighted green above)	**3.8**	**19,818**	**1,514**	**0**	**1**	**$ 4,287**	**$ 83,124**	**19.4**	**15.6**	**16**	**$ 2,765**	**0**	**18.7**	**38**	**220,149**	**27,503**	**27**	**$ 60,416**	**(0.3)**	**($29,182)**	**-2.7%**
		% of Existing	**4%**	**0.4919748**	**0.1058078**	**0**	**0**																

	City:	Newark, NJ				
	Occupied Hours/Week	70	70	70	70	50
		Building Operating	Auditorium Occupied	Gymnasium Occupied	Library Occupied	Classrooms Occupied
Temp	Enthalpy h (Btu/lb)	Bin Hours	Hours	Hours	Hours	Hours	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

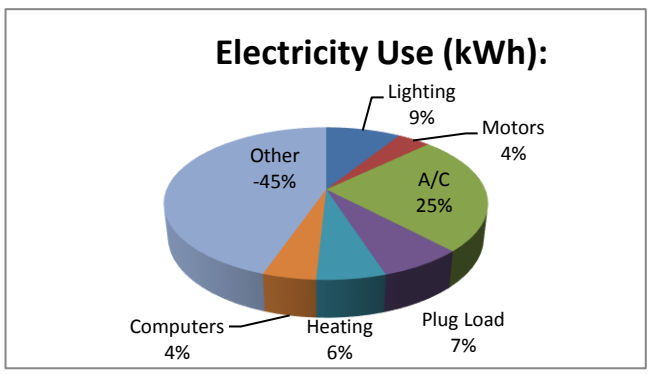
Heating System Efficiency	80%
Cooling Eff (kW/ton)	1.2

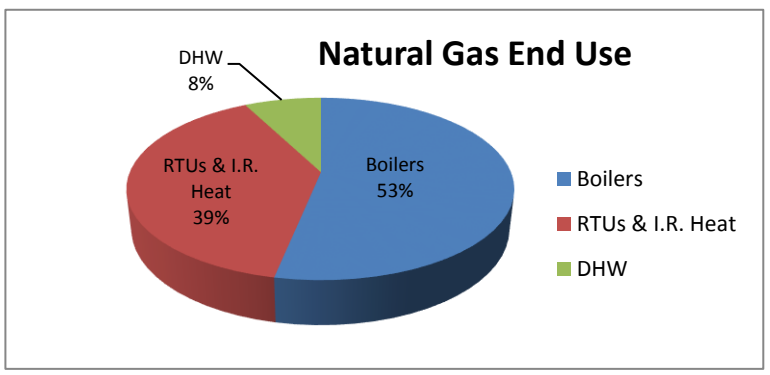
Heating		
Hours	4,427	Hrs
Weighted Avg	40	F
Avg	28	F

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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

Utility End Use Analysis				
Electricity Use (kWh):		**Notes/Comments:**		
40,283	Total	Based on utility analysis		
33,714	Lighting	From Lighting Calculations	0.836928729	
15,034	Motors	Estimated	0.373209542	
95,430	A/C	Estimated	2.3689894	
26,971	Plug Load	Estimated	0.669538019	
22,000	Heating	Estimated	0.546136087	
17,000	Computers	Estimated	0.422014249	
(169,866)	Other	Remaining	-4.216816027	
Natural Gas Use (Therms):		**Notes/Comments:**		
14,313	Total	Based on utility analysis		
14,610	Boilers	Therms/SF x Square Feet Served	1.020750367	
10,750	RTUs & I.R. Heat	Based on utility analysis	0.751065465	27,457
2,097	DHW	Based on utility analysis	0.146510166	





Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-1: Window Replacement

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

Linear Feet of window Edge	271.0	LF	Cooling System Efficiency	1.2	kW/ton	Heating System Efficiency	80%	
Area of window glass	407.5	SF	Ex Occupied Clng Temp.	74	*F	Heating On Temp.	55	*F
Existing Infiltration Factor	**0.20**	**cfm/LF**	Ex Unoccupied Clng Temp.	85	*F	Ex Occupied Htg Temp.	72	*F
Proposed Infiltration Factor	**0.10**	**cfm/LF**	Cooling Occ Enthalpy Setpoint	27.5	Btu/lb	Ex Unoccupied Htg Temp.	65	*F
Existing U Value	**1.13**	**Btuh/SF/°F**	Cooling Unocc Enthalpy Setpoint	27.5	Btu/lb	Electricity	$ 0.151	$/kWh
Proposed U Value	**0.45**	**Btuh/SF/°F**				Natural Gas	$ 0.94	$/therm

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Therms	Proposed Heating Energy Therms
A		B	C	D	E	F	G	H	I	J	K	L
102.5	50.1	0	0	0	-18,636	-13,570	-7,982	-5,965	0	0	0	0
97.5	42.5	6	2	4	-14,480	-9,414	-6,139	-4,121	7	3	0	0
92.5	39.5	45	16	29	-11,446	-6,380	-4,856	-2,839	37	16	0	0
87.5	36.6	146	52	94	-8,436	-3,371	-3,585	-1,568	76	33	0	0
82.5	34.0	298	106	192	-5,499	0	-2,351	0	59	25	0	0
77.5	31.6	476	170	306	-2,612	0	-1,142	0	44	19	0	0
72.5	29.2	662	237	426	0	0	0	0	0	0	0	0
67.5	27.0	740	264	476	0	0	0	0	0	0	0	0
62.5	24.5	765	273	492	0	0	0	0	0	0	0	0
57.5	21.4	733	262	471	0	0	0	0	0	0	0	0
52.5	18.7	668	239	430	10,121	6,488	4,147	2,658	0	0	65	27
47.5	16.2	659	235	424	12,716	9,083	5,210	3,721	0	0	86	35
42.5	14.4	685	245	441	15,311	11,678	6,273	4,784	0	0	111	46
37.5	12.6	739	264	475	17,906	14,273	7,336	5,848	0	0	144	59
32.5	10.7	717	256	461	20,501	16,868	8,399	6,911	0	0	163	67
27.5	8.6	543	194	349	23,096	19,463	9,463	7,974	0	0	141	58
22.5	6.8	318	114	205	25,691	22,058	10,526	9,037	0	0	93	38
17.5	5.5	245	88	158	28,286	24,653	11,589	10,101	0	0	80	33
12.5	4.1	156	56	100	30,881	27,248	12,652	11,164	0	0	56	23
7.5	2.6	92	33	59	33,476	29,843	13,715	12,227	0	0	36	15
2.5	1.0	36	13	23	36,071	32,438	14,779	13,290	0	0	15	6
-2.5	0.0	19	7	12	38,666	35,033	15,842	14,353	0	0	9	4
-7.5	-1.5	8	3	5	41,261	37,628	16,905	15,417	0	0	4	2
TOTALS		**8,760**	**3,129**	**5,631**					222	97	**1,001**	**410**

Existing Window Infiltration	**54**	**cfm**
Existing Window Heat Transfer	**460**	**Btuh/°F**
Proposed Window Infiltration	**27**	**cfm**
Proposed Window Heat Transfer	**183**	**Btuh/°F**

Savings	**591**	**Therms**	**$ 557**
	125	**kWh**	**$ 19**
			$ 576

Window ID	Location	Quantity	Width (ft)	Height (ft)	Linear Feet (LF)	Area (SF)	Infiltration Rate (CFM/LF)	U Value (Btuh/SF/°F)	Infiltration (CFM)	Heat Transfer (Btuh/°F)
1	building	10	8	5	260.0	400.0	0.2	1.13	52.0	452.0
2	building	1	2.5	3	11.0	7.5	0.2	1.13	2.2	8.5
Total		**11**	**10.5**	**8**	**271.0**	**407.5**	**0.20**	**1.13**	**54.2**	**460.5**

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-1 Replace Windows - Cost

Multipliers	
Material:	1.03
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Window Replacement	400	sq.ft	$ 90	$ 60	$ -	$ 36,000	$ 24,000	$ -	$ 60,000	Vendor Est per SF

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

$ 60,000	Subtotal
$ 6,000	10% Contingency
$ 13,200	20% Contractor O&P
$ 7,920	10% Engineering Fees
$ 87,100	**Total**

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-2: Window Film

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

Linear Feet of window Ed	271.0	LF	Cooling System Efficiency	1.2	kW/ton	Heating System Efficiency	0%		
Area of window glass	407.5	SF	Ex Occupied Clng Temp.	74	*F	Heating On Temp.	55	*F	
Existing Infiltration Factor	0.20	cfm/LF	Ex Unoccupied Clng Tem	85	*F	Ex Occupied Htg Temp.	72	*F	
Proposed Infiltration Facto	0.10	cfm/LF	Cooling Occ Enthalpy Set	27.5	Btu/lb	Ex Unoccupied Htg Temp	60	*F	
Existing U Value	0.80	Btuh/SF/°F	Cooling Unocc Enthalpy S	27.5	Btu/lb	Electricity	$ 0.151	$/kWh	
Proposed U Value	0.40	Btuh/SF/°F				Natural Gas	$ 0.94	$/therm	

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

Months	Horizontal Unshaded	North Unshaded	North Shaded	East Unshaded	East Shaded	South Unshaded	South Shaded	West Unshaded	West Shaded	Averages	Total Btu/Windows per Day	BTUH daily average	Cooling Energy per Year (kWh)
January	390	130	120	280	250	730	710	280	250	349	142,172	5924	0
February	590	180	160	320	340	800	730	380	340	427	173,867	7244	0
March	860	240	210	520	450	770	600	520	450	513	209,183	8716	0
April **	1120	310	270	650	550	650	430	630	530	571	232,728	9697	174.5
May	1300	370	320	700	590	550	370	690	580	608	247,669	10320	767.8
June	1400	410	360	740	610	510	370	730	610	638	259,894	10829	779.7
July	1380	400	350	740	620	530	380	730	610	638	259,894	10829	805.7
August	1230	340	300	690	580	620	400	670	560	599	244,047	10169	756.5
September	980	270	240	580	500	740	530	570	490	544	221,861	9244	665.6
October **	700	200	180	450	400	820	720	440	380	477	194,242	8093	150.5
November	430	140	130	300	260	700	670	280	250	351	143,078	5962	0
December	320	120	100	230	210	650	630	230	200	299	121,797	5075	0
													4100.34

Effectiveness of Window Film:	60%	**Savings**	**0**	**Therms**	**$ -**
			2,460	**kWh**	**$ 371**
					$ 371

Window ID	Location	Quantity	Width (ft)	Height (ft)	Linear Feet (LF)	Area (SF)	Infiltration Rate (CFM/LF)	U Value (Btuh/SF/°F)	Infiltration (CFM)	Heat Transfer (Btuh/°F)
1	building	10	8	5	260.0	400.0	0.2	0.8	52.0	320.0
2	building	1	2.5	3	11.0	7.5	0.2	0.8	2.2	6.0
Total		**11**	**10.5**	**8**	**271.0**	**407.5**	**0.20**	**0.80**	**54.2**	**326.0**

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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-2 Window Film - Cost

Multipliers	
Material:	1.03
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Window Film Installation	400	sq.ft	$ 8.00	$ 1.00	$ -	$ 3,200	$ 400	$ -	$ 3,600	Vendor Est per SF

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

$ 3,600	Subtotal
$ 360	10% Contingency
$ 792	20% Contractor O&P
$ 475	10% Engineering Fees
$ 5,200	**Total**

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-3 Replace Roof and Install Insulation

Existing: Flat roofing in some areas is nearing the end of its useful life.
Proposed: Replace roof and install additional insulation in attic cavity to reduce heat transfer.

Area of roof	10,000	SF	Cooling System Efficiency	1.2	kW/ton	Heating System Efficiency	80%	
Existing Infiltration Factor	**0.02**	**cfm/SF**	Ex Occupied Clng Temp.	72	*F	Heating On Point	55	*F
Proposed Infiltration Factor	**0.02**	**cfm/SF**	Ex Unoccupied Clng Temp.	85	*F	Ex Occupied Htg Temp.	80	*F
Existing U Value	**0.076**	**Btuh/SF/°F**	Cooling Occ Enthalpy Setpoi	27.5	Btu/lb	Ex Unoccupied Htg Temp.	75	*F
Proposed U Value	**0.047**	**Btuh/SF/°F**	Cooling Unocc Enthalpy Setp	27.5	Btu/lb	Cooling Electricity	$ 0.151	$/kWh
						Heating NG Cost	$ 0.94	$/Therm

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Attic Infiltration & Heat Load BTUH	Attic Infiltration & Heat Load BTUH	Attic Infiltration & Heat Load BTUH	Attic Infiltration & Heat Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Therms	Proposed Heating Energy Therms
A		B	C	D	E	F	G	H	I	J	K	L
97.5	35.4	6	3	4	-26,497	-16,617	-19,102	-12,992	12	9	0	0
92.5	37.4	31	13	18	-24,492	-14,612	-18,547	-12,437	58	46	0	0
87.5	35.0	131	55	76	-18,516	-8,636	-14,021	-7,911	167	137	0	0
82.5	33.0	500	208	292	-12,972	0	-9,927	0	270	207	0	0
77.5	31.5	620	258	362	-7,823	0	-6,228	0	202	161	0	0
72.5	29.9	664	277	387	-2,545	0	-2,400	0	70	66	0	0
67.5	27.2	854	356	498	0	0	0	0	0	0	0	0
62.5	24.0	927	386	541	0	0	0	0	0	0	0	0
57.5	20.3	600	250	350	0	0	0	0	0	0	0	0
52.5	18.2	730	304	426	26,840	21,960	18,865	15,435	0	0	219	154
47.5	16.0	491	205	286	31,720	26,840	22,295	18,865	0	0	177	125
42.5	14.5	656	273	383	36,600	31,720	25,725	22,295	0	0	277	195
37.5	12.5	1,023	426	597	41,480	36,600	29,155	25,725	0	0	494	347
32.5	10.5	734	306	428	46,360	41,480	32,585	29,155	0	0	399	281
27.5	8.7	334	139	195	51,240	46,360	36,015	32,585	0	0	202	142
22.5	7.0	252	105	147	56,120	51,240	39,445	36,015	0	0	168	118
17.5	5.4	125	52	73	61,000	56,120	42,875	39,445	0	0	91	64
12.5	3.7	47	20	27	65,880	61,000	46,305	42,875	0	0	37	26
7.5	2.1	34	14	20	70,760	65,880	49,735	46,305	0	0	29	20
2.5	1.3	1	0	1	75,640	70,760	53,165	49,735	0	0	1	1
TOTALS		**8,760**	**3,650**	**5,110**					780	627	**2,094**	**1,472**

Existing Ceiling Infiltration	**200**	**cfm**
Existing Ceiling Heat Transfer	**760**	**Btuh/°F**
Proposed Ceiling Infiltration	**200**	**cfm**
Proposed Ceiling Heat Transfer	**470**	**Btuh/°F**

Savings	**622**	**Therms**	**$ 586**
	153	**kWh**	**$ 23**
			$ 609

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-3 Replace Roof and Install Insulation - 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.		
Replace roof & Insulate	10,000	SF	$ 8.00	$ 2.00		$ 82,400	$ 25,000		$ 107,400	RS Means 2012
						$ -	$ -	$ -	$ -	

Note: Cost estimates are for energy savings calculations only, do not use for procurement

$ 107,400	Subtotal
$ 26,850	25% Contingency
$ 134,250	**Total**

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-4: Install Door Seals

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

Heating System Efficiency	80%		Ex Occupied Clng Temp.		*F	Ex Occupied Htg Temp.		*F
Cooling System Efficiency	1.20	kW/ton	Ex Unoccupied Clng Temp.		*F	Ex Unoccupied Htg Temp.		*F
Linear Feet of Door Edge	50	LF	Cooling Occ Enthalpy Setpoint	27.5	Btu/lb	Electricity	$ 0.15	$/kWh
Existing Infiltration Factor*	1.5	cfm/LF	Cooling Unocc Enthalpy Setpoint	27.5	Btu/lb	Natural Gas	$ 0.94	$/therm
Proposed Infiltration Factor*	0.45	cfm/LF						

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

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Door Infiltration Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy therms	Proposed Heating Energy therms
A		B	C	D	E	F	G	H	I	J	K	L
102.5	0.0	0	0	0	9,281	9,281	2,784	2,784	0	0	0	0
97.5	35.4	6	3	4	-2,669	-2,669	-801	-801	2	0	0	0
92.5	37.4	31	13	18	-3,342	-3,342	-1,003	-1,003	10	3	0	0
87.5	35.0	131	55	76	-2,526	-2,526	-758	-758	33	10	0	0
82.5	33.0	500	208	292	-1,872	-1,872	-562	-562	94	28	0	0
77.5	31.5	620	258	362	-1,366	-1,366	-410	-410	85	25	0	0
72.5	29.9	664	277	387	-812	-812	-244	-244	54	16	0	0
67.5	27.2	854	356	498	106	106	32	32	0	0	1	0
62.5	24.0	927	386	541	1,183	1,183	355	355	0	0	14	4
57.5	20.3	600	250	350	2,447	2,447	734	734	0	0	18	6
52.5	18.2	730	304	426	3,136	3,136	941	941	0	0	29	9
47.5	16.0	491	205	286	3,884	3,884	1,165	1,165	0	0	24	7
42.5	14.5	656	273	383	4,385	4,385	1,316	1,316	0	0	36	11
37.5	12.5	1,023	426	597	5,059	5,059	1,518	1,518	0	0	65	19
32.5	10.5	734	306	428	5,738	5,738	1,721	1,721	0	0	53	16
27.5	8.7	334	139	195	6,357	6,357	1,907	1,907	0	0	27	8
22.5	7.0	252	105	147	6,929	6,929	2,079	2,079	0	0	22	7
17.5	5.4	125	52	73	7,446	7,446	2,234	2,234	0	0	12	3
12.5	3.7	47	20	27	8,024	8,024	2,407	2,407	0	0	5	1
7.5	2.1	34	14	20	8,578	8,578	2,573	2,573	0	0	4	1
2.5	1.3	1	0	1	8,839	8,839	2,652	2,652	0	0	0	0
-2.5	0.0	0	0	0	203	203	61	61	0	0	0	0
-7.5	0.0	0	0	0	608	608	182	182	0	0	0	0
TOTALS		**8,760**	**3,650**	**5,110**					**277**	**83**	**307**	**92**

Existing Door Infiltration	**75**	**cfm**	**Savings**	**215**	**therms**	**$ 203**
Existing Unoccupied Door Infiltration	**75**	**cfm**		**194**	**kWh**	**$ 29**
Proposed Door Infiltration	**23**	**cfm**				**$ 232**
Proposed Unoccupied Door Infiltration	**23**	**cfm**				

Door	Width (ft)	Height (ft)	Linear Feet (LF)	gap (in)	gap location	LF of gap	% door w/ gap	Average gap for door (in)
1a	8	12	40	0.25	bottom/seam	8	20%	0.05
1b	8	12	40	0.25	bottom/seam	8	20%	0.05
1c	6	8	28	0.25	all sides	28	100%	0.25
2a	3	7	20	0.25	bottom/seam	3	15%	0.0375
2b	3	7	20	0.25	bottom/seam	3	15%	0.0375
Total	**28**	**46**	**148**	**0.250**		**50**	**34%**	**0.085**

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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-4: Install Door Seals - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									$ -	
Door Weatherization Seals & Sweeps	9	EA	$ 40	$ 115	$ -	$ 370	$ 1,290	$ -	$ 1,659	RS Means 2012
						$ -	$ -	$ -	$ -	

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

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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-5: Add Condensing Boiler

Description: This ECM evaluates the addition of a high efficiency condensing gas boiler. The existing boiler efficiency is 80% (per NJBPU protocols) and the proposed boiler efficiency is 90% (average seasonal efficiency). Electrical power consumption due to pumps is considered to be the same for both the proposed system and the baseline system.

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 0.94	/ Therm	Natural Gas
Baseline Fuel Cost		/ Gal	No. 2 Oil
FORMULA CONSTANTS			
Oversize Factor	0.8		
Hours per Day	24		
Design Outdoor Temp	14	F	
Infrared Conversion Factor	1.0		1.0 if Boiler, 0.8 if Infrared Heater
EXISTING			
Capacity	300,000	btu/hr	existing boiler
Heating Combustion Efficiency	82%		existing boiler
Heating Degree-Day	2,274	Degree-day	
Design Temperature Difference	56	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	300,000	btu/hr	wall hung unit
Efficiency	90%		proposed eff
SAVINGS			
Fuel Savings	254	Therms	NJ Protocols Calculation
Fuel Cost Savings	$ 239		

Savings calculation formulas are taken from NJ Protocols document for Occupancy Controlled Thermostats

Algorithms

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

Definition of Variables

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

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

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

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

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

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

EFF_B = Efficiency of baseline heaters (AFUE %)

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

Furnaces and Boilers

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

Sources:

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

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-5: Add Condensing Boiler - 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.		
399 MBH Condensing Boiler	1	EA	$ 7,500	$ 5,000		$ 7,703	$ 6,230	$ -	$ 13,933	Vendor Estimate
Flue Installation	1	EA	$ 500.0	$ 1,000.00		$ 514	$ 1,246	$ -	$ 1,760	Vendor Estimate
Miscellaneous Electrical	1	LS	$ 500	$ 500		$ 514	$ 623	$ -	$ 1,137	RS Means 2012
Miscellaneous HW Piping	1	LS	$ 1,200	$ 1,000		$ 1,232	$ 1,246	$ -	$ 2,478	RS Means 2012
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	
						$ -	$ -	$ -	$ -	

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

$ 19,307	Subtotal
$ 4,827	25% Contingency
$ 24,134	**Total**

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

EQUIPMENT	AREA SERVED	COOLING CAPACITY (MBH)
RTU-1	Various spaces	72
	Total Electric DX Cooling:	*72* *MBH*

ECM-6: Replace (1) RTU with (2) RTUs

Existing RTU EER = 9.0

ECM Description Summary

By replacing older packaged rooftop HVAC equipment with more efficent equipment, electrical energy can be saved. It is recommended this unit (Tempstar) be replaced by two (2) modern AAON units with variable speed supply fans and compressors.

ASSUMPTIONS			Comments
Electric Cost	$0.151	/ kWh	
Average run hours per Week	168	Hours	
Space Balance Point	55	F	
Space Temperature Setpoint	74	deg F	Setpoint.
Existing equipment motor HP	7.5		
Existing motor efficiency	80.0%		Unit is 15+ years old; motor efficiency affected by condition and environment over time
Existing Annual Electric Useage	13,456	kWh	
Average run hours per Week	80	Hours	
Proposed BTU/Hr rating of replacment DX equipment	72,000	Btu / Hr	Total BTU/hr of DX cooling equipment to be added.
Proposed average EER of replacment DX equipment	16.0		
Proposed equipment motor HP	7.5		Premium efficiency motor with VFD.
Proposed motor efficiency	92.0%		
Proposed Annual Electric Usage	5,235	kWh	

ANNUAL SAVINGS		
Annual Electrical Usage Savings	8,221	kWh
Annual Cost Savings	$1,242	
Total Project Cost	$80,700	
Simple Payback	65	years

OAT - DB Bin Temp F	Annual Hours	Cooling Hrs at Temp Above balance point	Assumed % of time of	Assumed hrs of Operation
102.5	0	0	100%	0
97.5	3	3	89%	3
92.5	34	34	79%	27
87.5	131	131	68%	90
82.5	500	500	58%	289
77.5	620	620	47%	294
72.5	664	0	0%	0
67.5	854	0	0%	0
62.5	927	0	0%	0
57.5	600	0	0%	0
52.5	610	0	0%	0
47.5	611	0	0%	0
42.5	656	0	0%	0
37.5	1,023	0	0%	0
32.5	734	0	0%	0
27.5	334	0	0%	0
22.5	252	0	0%	0
17.5	125	0	0%	0
12.5	47	0	0%	0
7.5	13	0	0%	0
2.5	0	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0
Total	8,738	1,288	55%	702

Millburn Township Public Schools
CHA Project Number: 28330
Hartshorn Elementary School

ECM-6 Replace (1) RTU with (2) RTUs

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Existing RTU demolition	1	EA		$ 500	$ 2,000	$ -	$ 675	$ 2,200	$ 2,875	Includes crane
DX cooling and gas heating RTU, 3.0 tons (on average)	2	EA	$ 8,500	$ 3,500		$ 18,700	$ 9,450	$ -	$ 28,150	Vendor quote / Eng. Estimate
- N.G. Valve & Piping to RTU	2	EA	$ 350	$ 1,500		$ 770	$ 4,050	$ -	$ 4,820	Engineering estimate
- Controls wiring for (2) RTU	2	EA	$ 250	$ 300		$ 550	$ 810	$ -	$ 1,360	Engineering estimate
- Roof mounted installation and ductwork	2	EA	$ 2,500	$ 4,500		$ 5,500	$ 12,150	$ -	$ 17,650	Engineering estimate
Electrical - misc.	2	LS	$ 1,000	$ 1,500		$ 2,200	$ 4,050	$ -	$ 6,250	Engineering estimate
						$ -	$ -	$ -	$ -	

Note : Cost estimates are for energy calculations only- do not use for procurement

$ 61,105	Subtotal
$ 6,111	10% Contingency
$ 13,443	20% Contractor O&P
$ -	0% Engineering
$ 80,700	**Total**

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

EQUIPMENT	AREA/EQUIPMENT SERVED	COOLING CAPACITY (btu/h)
(3) AC Units	Building	36,000
	Total btu/h of all window A/C Units:	*36,000* *btu/h*

ECM-7: Air Conditioner Controller

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

ASSUMPTIONS			Comments
Electric Cost	$0.151	/ kWh	
Average run hours per Week	80	Hours	
Space Balance Point	55	F	
Space Temperature Setpoint	72	deg F	Setpoint.
BTU/Hr Rating of existing DX equipment	36,000	Btu / Hr	Total BTU/hr of DX cooling equipment to be replaced.
Average EER	10.7		
Existing Annual Electric Usage	3,127	kWh	

Item	Value	Units	Comments
Proposed Annual Electric Usage	1,518	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Electrical Usage Savings	1,610	kWh
Annual Cost Savings	$243	
Total Project Cost	$600	
Simple Payback	2	years

OAT - DB Bin Temp F	Annual Hours	**Existing Hours of Operation**	Proposed % of time of operation	**Proposed hrs of Operation**
102.5	0	0	100%	0
97.5	6	3	89%	3
92.5	31	15	79%	12
87.5	131	62	68%	43
82.5	500	238	58%	138
77.5	620	295	47%	140
72.5	664	316	37%	116
67.5	854	0	0%	0
62.5	927	0	0%	0
57.5	600	0	0%	0
52.5	730	0	0%	0
47.5	491	0	0%	0
42.5	656	0	0%	0
37.5	1,023	0	0%	0
32.5	734	0	0%	0
27.5	334	0	0%	0
22.5	252	0	0%	0
17.5	125	0	0%	0
12.5	47	0	0%	0
7.5	34	0	0%	0
2.5	1	0	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0
Total	8,760	**930**	49%	**451**

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-7: Air Conditioner Controller - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						0	$ -	$ -	$ -	
Window AC Controller	3	EA	$ 150	$ -	$ -	462.15	$ -	$ -	$ 462	Estimated
						$ -	$ -	$ -	$ -	

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

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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

AIR HANDLER	AREA SERVED	CFM	OA CFM	% OA
RTU-1	Senior Center	7,500	1,500	20%
RTU-2	Public Safety Building	4,000	800	20%
			2,300	*CFM*

ECM 8: Demand Controlled Ventilation

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

Electric Cost	$ 0.15	/kWh
Natural Gas Cost	$ 0.94	/therm
Facility Ventilation Heating Load	86,940	BTU/Hour[1,2,3]
Facility Ventilation Cooling Load	24,840	BTU/Hour[1,2,3]
Existing Ventilation Heating Usage	4,811	Therms[2]
Existing Ventilation Cooling Usage	38,664	kWh[3]
Proposed Ventilation Heating Usage	4,570	Therms[7]
Proposed Ventilation Cooling Usage	36,731	kWh[7]
Total heating savings	241	**Therms**
Total cooling savings	1,933	**kWh**
Total cost savings	519	
Estimated Total Project Cost	$10,600	[8]
Simple Payback	20.4	**years**

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

Assumptions

1	2,300	OA AHU airflow based exsiting equipment model numbers
2	35	°F, Assumed average heating Δt (mixed air and supply)
3	10	°F, Assumed average cooling Δt (mixed air and supply)
4	80%	Heating Efficiency - %
5	1.2	Cooling Efficiency - kW/Ton
6	4,427	AHU run time per heating/cooling season bin data
7	5%	Estimated savings for DCV based on NJ Protocols
8	$ 10,600	estimated measure cost for installation of sensors and associated controls

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM 8: Demand Controlled Ventilation - 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.		
						$ -	$ -	$ -	$ -	
Re-Program HVAC Controls to allow DCV	2	EA	$ -	$ 2,500		$ -	$ 6,230	$ -	$ 6,230	RS Means 2012
CO2 Sensor	2	EA	$ 500	$ 500		$ 1,027	$ 1,246	$ -	$ 2,273	RS Means 2012
						$ -	$ -	$ -	$ -	

$ 8,503	Subtotal
$ 2,126	25% Contingency
$ 10,600	**Total**

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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-9: Replace Gas-Fired DHW Heater w/ Tankless 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	**187**	Therms/month	Calculated from utility bill
Total Annual Utility Demand by Water Heater	224,400	MBTU/yr	1therm = 100 MBTU
Existing DHW Heater Efficiency	78%		Per manufacturer nameplate
Total Annual Hot Water Demand (w/ standby losses)	175,032	MBTU/yr	
Existing Tank Size	40	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)	0.6	MBH	
Annual Standby Hot Water Load	5,585	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	170,068	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Takagi Flash T-H1 instantaneous, condensing DHW Heater
Proposed Fuel Use	1,772	Therms	Standby Losses and inefficient DHW heater eliminated
Utility Cost	$0.94	$/Therm	
Existing Operating Cost of DHW	$2,114	$/yr	
Proposed Operating Cost of DHW	$1,669	$/yr	

Savings Summary:

Utility	Energy Savings	Cost Savings
Therms/yr	472	$445

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

ECM-9: Replace Gas-Fired DHW Heater w/ Tankless Condensing Gas-Fired DHW Heater - Cost

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	$ 500		$ 308	$ 623	$ -	$ 931	RS Means 2012
Venting Kit	1	EA	$ 450	$ 650		$ 462	$ 810	$ -	$ 1,272	RS Means 2012
Miscellaneous Piping and Valves	1	LS	$ 200	$ 500		$ 205	$ 623	$ -	$ 828	RS Means 2012

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

$ 7,551	Subtotal
$ 1,888	25% Contingency
$ 9,438	**Total**

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-10: 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	$9.00	$ / kGal
Faucets in Building	3	
Average Uses / Faucet (per day)	3	Based on # of occupants
Average Time of Use	10.0	seconds
Average Flowrate	2.5	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	3	
Proposed Flowrate	0.5	gpm

HEATING SAVINGS		
Fuel Cost	$ 0.94	/Therm
Number of Faucets	3	
Hours per Day of Usage	0.5	hrs
Days per Year of Facility Usage	355	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	1.33	kGal / year
Proposed Faucet Water Use	0.27	kGal / year
Water Savings	1.07	kGal / year
Heating Savings	333	Therms
Cost Savings	$323	/ 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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

ECM-10: Replace faucets with low flow - 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 Faucet	3	EA	$ 10	$ 10	$ -	$ 31	$ 37	$ -	$ 68	Vendor Estimate
						$ -	$ -	$ -	$ -	

$ 68	Subtotal
$ 17	25% Contingency
$ 85	**Total**

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

Borough of Little Ferry
CHA Project Number: 28948
Senior Center & Public Safety Building

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

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

Total Building Area (Square Feet)	15,000
Is this audit funded by NJ BPU (Y/N)	Yes

Board of Public Utilites (BPU)

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

	Annual Utilities	
	kWh	Therms
Existing Cost (from utility)	$6,086	$13,479
Existing Usage (from utility)	40,283	14,313
Proposed Savings	19,818	1,514
Existing Total MMBtus	1,569	
Proposed Savings MMBtus	219	
% Energy Reduction	**14.0%**	
Proposed Annual Savings	$4,287	

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

	Incentives $		
	Elec	Gas	Total
			$5,000
Incentive #1	$0	$0	$0
Incentive #2	$0	$0	$0
Incentive #3	$0	$0	$0
Total All Incentives	**$0**	**$0**	**$0**

Total Project Cost	$83,124

		Allowable Incentive
% Incentives #1 of Utility Cost*	0.0%	$0
% Incentives #2 of Project Cost**	0.0%	$0
% Incentives #3 of Project Cost**	0.0%	$0
Total Eligible Incentives***	**$0**	
Project Cost w/ Incentives	$83,124	

Project Payback (years)	
w/o Incentives	w/ Incentives
19.4	19.4

* 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 Senior Center / Public Safety Building

CHA Project No. 28948

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
40LED	Main Room	28	T 32 R F 2 (ELE)	F42LL	60	1.7	SW	2912	4,892	28	T 38 R LED	RTLED38	38	1.1	SW	2,912	3,098	1,794	0.6	$ 255.21	$ 6,615.00	$0	25.9	25.9
40LED	Kitchen	2	T 32 R F 2 (ELE)	F42LL	60	0.1	OCC	1600	192	2	T 38 R LED	RTLED38	38	0.1	OCC	1,600	122	70	0.0	$ 10.55	$ 472.50	$0	44.8	44.8
40LED	Front Corridor	3	T 32 R F 2 (ELE)	F42LL	60	0.2	Breaker	2280	410	3	T 38 R LED	RTLED38	38	0.1	Breaker	2,280	260	150	0.1	$ 21.80	$ 708.75	$0	32.5	32.5
40LED	Front Office	3	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2400	432	3	T 38 R LED	RTLED38	38	0.1	SW	2,400	274	158	0.1	$ 22.85	$ 708.75	$0	31.0	31.0
254LED	Storage area	1	CFQ26/2	CFQ26/2	66	0.1	SW	500	33	1	EVO35/10	EVO35/10	39	0.0	SW	500	20	14	0.0	$ 2.52	$ 438.75	$35	173.8	159.9
227LED	Exterior wallpack	3	70 W MH Wall Pack	MH70/1	95	0.3	SW	4368	1,245	3	FXLED18	FXLED18/1	18	0.1	SW	4,368	236	1,009	0.2	$ 140.44	$ 1,269.68	$300	9.0	6.9
55LED	Corridor	2	2T 17 R F 3 (ELE)	F23ILL	47	0.1	SW	2280	214	2	2T 25 R LED	2RTLED	25	0.1	SW	2,280	114	100	0.0	$ 14.53	$ 405.00	$100	27.9	21.0
40LED	Toilet rooms (2)	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1000	240	4	T 38 R LED	RTLED38	38	0.2	SW	1,000	152	88	0.1	$ 14.08	$ 945.00	$0	67.1	67.1
40LED	Main Garage Area	24	T 32 R F 2 (ELE)	F42LL	60	1.4	SW	5000	7,200	24	T 38 R LED	RTLED38	38	0.9	SW	5,000	4,560	2,640	0.5	$ 365.38	$ 5,670.00	$0	15.5	15.5
40LED	Main Garage Area	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	5000	1,200	4	T 38 R LED	RTLED38	38	0.2	SW	5,000	760	440	0.1	$ 60.90	$ 945.00	$0	15.5	15.5
55LED	Toilet rooms	1	2T 17 R F 3 (ELE)	F23ILL	47	0.0	OCC	1000	47	1	2T 25 R LED	2RTLED	25	0.0	OCC	1,000	25	22	0.0	$ 3.52	$ 202.50	$50	57.5	43.3
198LED	Toilet room	1	2T 17 R F 2 (ELE)	F22LL	31	0.0	OCC	1000	31	1	2T 25 R LED	2RTLED	25	0.0	OCC	1,000	25	6	0.0	$ 0.96	$ 202.50	$50	210.9	158.9
35LED	Offices	7	T 32 R F 3 (ELE)	F43ILL/2	90	0.6	OCC	2400	1,512	7	T 59 R LED	RTLED38	38	0.3	OCC	2,400	638	874	0.4	$ 126.02	$ 1,653.75	$0	13.1	13.1
55LED	Meeting Room	6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	SW	1200	338	6	2T 25 R LED	2RTLED	25	0.2	SW	1,200	180	158	0.1	$ 24.63	$ 1,215.00	$300	49.3	37.1
97	Break Room / Lounge	8	EP 13 R CF 2	CFQ13/2-L	28	0.2	SW	3102.5	695	8	EP 13 R CF 2	CFQ13/2-L	28	0.2	SW	3,103	695	-	0.0	$ -	$ -	$0		#DIV/0!
41LED	Break Room / Lounge	6	1B 40 R F 2 (MAG)	F42SS	94	0.6	SW	3102.5	1,750	6	4 ft LED Tube	2007/2x2	30	0.2	SW	3,103	558	1,191	0.4	$ 168.82	$ 1,402.20	$0	8.3	8.3
55LED	Main Garage Area	3	2T 17 R F 3 (ELE)	F23ILL	47	0.1	SW	5000	705	3	2T 25 R LED	2RTLED	25	0.1	SW	5,000	375	330	0.1	$ 45.67	$ 607.50	$150	13.3	10.0
40LED	Boiler Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	1820	218	2	T 38 R LED	RTLED38	38	0.1	SW	1,820	138	80	0.0	$ 11.84	$ 472.50	$0	39.9	39.9
40LED	Large Storage area	8	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	500	240	8	T 38 R LED	RTLED38	38	0.3	SW	500	152	88	0.2	$ 16.46	$ 1,890.00	$0	114.9	114.9
227LED	Exterior wallpack	11	70 W MH Wall Pack	MH70/1	95	1.0	SW	4368	4,565	11	FXLED18	FXLED18/1	18	0.2	SW	4,368	865	3,700	0.8	$ 514.93	$ 4,655.48	$1,100	9.0	6.9
	Total	**127**				**8.1**			**26,160**	**127**			**638**	**4.3**			**13,247**	**12,913**	**3.8**	**$1,821**	**$30,480**	**$2,085**		
																	Demand Savings			**3.8**	**$104**			
																	kWh Savings			**12,913**	**$1,717**			
																	Total savings				**$1,821**		**16.7**	**15.6**

Energy Audit of Senior Center / Public Safety Building
CHA Project No. 28948
ECM-L2 Install Occupancy Sensors

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	(kW Saved) * ($/kWh)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
40LED	Main Room	28	T 32 R F 2 (ELE)	F42LL	60	1.7	SW	2912	4,892.2	28	T 32 R F 2 (ELE)	F42LL	60	1.7	SW	2912	4,892.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Kitchen	2	T 32 R F 2 (ELE)	F42LL	60	0.1	OCC	1600	192.0	2	T 32 R F 2 (ELE)	F42LL	60	0.1	OCC	1200	144.0	48.0	0.0	$6.38	$128.25	$20.00	20.1	17.0
40LED	Front Corridor	3	T 32 R F 2 (ELE)	F42LL	60	0.2	Breaker	2280	410.4	3	T 32 R F 2 (ELE)	F42LL	60	0.2	Breaker	2280	410.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Front Office	3	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2400	432.0	3	T 32 R F 2 (ELE)	F42LL	60	0.2	None	2400	432.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
254LED	Storage area	1	CFQ26/2	CFQ26/2	66	0.1	SW	500	33.0	1	CFQ26/2	CFQ26/2	66	0.1	None	500	33.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
227LED	Exterior wallpack	3	70 W MH Wall Pack	MH70/1	95	0.3	SW	4368	1,244.9	3	70 W MH Wall Pack	MH70/1	95	0.3	None	4368	1,244.9	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
55LED	Corridor	2	2T 17 R F 3 (ELE)	F23ILL	47	0.1	SW	2280	214.3	2	2T 17 R F 3 (ELE)	F23ILL	47	0.1	None	2280	214.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Toilet rooms (2)	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1000	240.0	4	T 32 R F 2 (ELE)	F42LL	60	0.2	None	1000	240.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Main Garage Area	24	T 32 R F 2 (ELE)	F42LL	60	1.4	SW	5000	7,200.0	24	T 32 R F 2 (ELE)	F42LL	60	1.4	None	5000	7,200.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Main Garage Area	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	5000	1,200.0	4	T 32 R F 2 (ELE)	F42LL	60	0.2	None	5000	1,200.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
55LED	Toilet rooms	1	2T 17 R F 3 (ELE)	F23ILL	47	0.0	OCC	1000	47.0	1	2T 17 R F 3 (ELE)	F23ILL	47	0.0	None	1000	47.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
198LED	Toilet room	1	2T 17 R F 2 (ELE)	F22LL	31	0.0	OCC	1000	31.0	1	2T 17 R F 2 (ELE)	F22LL	31	0.0	None	1000	31.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	Offices	7	T 32 R F 3 (ELE)	F43ILL/2	90	0.6	OCC	2400	1,512.0	7	T 32 R F 3 (ELE)	F43ILL/2	90	0.6	None	2400	1,512.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
55LED	Meeting Room	6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	SW	1200	338.4	6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	OCC	1000	282.0	56.4	0.0	$7.50	$128.25	$20.00	17.1	14.4
97	Break Room / Lounge	8	EP 13 R CF 2	CFQ13/2-L	28	0.2	SW	3102.5	695.0	8	EP 13 R CF 2	CFQ13/2-L	28	0.2	OCC	1500	336.0	359.0	0.0	$47.74	$128.25	$20.00	2.7	2.3
41LED	Break Room / Lounge	6	1B 40 R F 2 (MAG)	F42SS	94	0.6	SW	3102.5	1,749.8	6	1B 40 R F 2 (MAG)	F42SS	94	0.6	OCC	1500	846.0	903.8	0.0	$120.21	$128.25	$20.00	1.1	0.9
55LED	Main Garage Area	3	2T 17 R F 3 (ELE)	F23ILL	47	0.1	SW	5000	705.0	3	2T 17 R F 3 (ELE)	F23ILL	47	0.1	None	5000	705.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Boiler Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	1820	218.4	2	T 32 R F 2 (ELE)	F42LL	60	0.1	None	1820	218.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
40LED	Large Storage area	8	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	500	240.0	8	T 32 R F 2 (ELE)	F42LL	60	0.5	None	500	240.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
227LED	Exterior wallpack	11	70 W MH Wall Pack	MH70/1	95	1.0	SW	4368	4,564.6	11	70 W MH Wall Pack	MH70/1	95	1.0	None	4368	4,564.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
															0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
															0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
															0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
															0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
															0	#N/A	#VALUE!	#VALUE!	#N/A	#VALUE!			#VALUE!	#VALUE!
	Total	**127**				**8.1**			**26159.9**	**127.0**				**8.1**			**24792.7**	**1367.2**	**0.0**	**181.8**	**513.0**	**80.0**		
																	Demand Savings			**0.0**	**$0**			
																	kWh Savings			**1,367**	**$182**			
																	Total Savings				**$182**		**2.8**	**2.4**

Energy Audit of Senior Center / Public Safety Building
CHA Project No. 28948
ECM-L3 Lighting Replacements with Occupancy Sensors

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of fixtures before the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Fixt No.)	Pre-inst. control device	Estimated daily hours for the usage group	(kW/space) * (Annual Hours)	No. of fixtures after the retrofit	Lighting Fixture Code	Code from Table of Standard Fixture Wattages	Value from Table of Standard Fixture Wattages	(Watts/Fixt) * (Number of Fixtures)	Retrofit control device	Estimated annual hours for the usage group	(kW/space) * (Annual Hours)	(Original Annual kWh) - (Retrofit Annual kWh)	(Original Annual kW) - (Retrofit Annual kW)	($/kWh) * ($/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
40LED	Main Room	28	T 32 R F 2 (ELE)	F42LL	60	1.7	SW	2912	4,892	28	T 38 R LED	RTLED38	38	1.1	SW	2,912	3,098	1,794	0.6	$ 255.21	$ 6,615.00	$ -	25.9	25.9
40LED	Kitchen	2	T 32 R F 2 (ELE)	F42LL	60	0.1	OCC	1600	192	2	T 38 R LED	RTLED38	38	0.1	OCC	1,200	91	101	0.0	$ 14.59	$ 600.75	$ 20	41.2	39.8
40LED	Front Corridor	3	T 32 R F 2 (ELE)	F42LL	60	0.2	Breaker	2280	410	3	T 38 R LED	RTLED38	38	0.1	Breaker	2,280	260	150	0.1	$ 21.80	$ 708.75	$ -	32.5	32.5
40LED	Front Office	3	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	2400	432	3	T 38 R LED	RTLED38	38	0.1	None	2,400	274	158	0.1	$ 22.85	$ 708.75	$ -	31.0	31.0
254LED	Storage area	1	CFQ26/2	CFQ26/2	66	0.1	SW	500	33	1	EVO35/10	EVO35/10	39	0.0	None	500	20	14	0.0	$ 2.52	$ 438.75	$ 35	173.8	159.9
227LED	Exterior wallpack	3	70 W MH Wall Pack	MH70/1	95	0.3	SW	4368	1,245	3	FXLED18	FXLED18/1	18	0.1	None	4,368	236	1,009	0.2	$ 140.44	$ 1,269.68	$ 300	9.0	6.9
55LED	Corridor	2	2T 17 R F 3 (ELE)	F23ILL	47	0.1	SW	2280	214	2	2T 25 R LED	2RTLED	25	0.1	None	2,280	114	100	0.0	$ 14.53	$ 405.00	$ 100	27.9	21.0
40LED	Toilet rooms (2)	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	1000	240	4	T 38 R LED	RTLED38	38	0.2	None	1,000	152	88	0.1	$ 14.08	$ 945.00	$ -	67.1	67.1
40LED	Main Garage Area	24	T 32 R F 2 (ELE)	F42LL	60	1.4	SW	5000	7,200	24	T 38 R LED	RTLED38	38	0.9	None	5,000	4,560	2,640	0.5	$ 365.38	$ 5,670.00	$ -	15.5	15.5
40LED	Main Garage Area	4	T 32 R F 2 (ELE)	F42LL	60	0.2	SW	5000	1,200	4	T 38 R LED	RTLED38	38	0.2	None	5,000	760	440	0.1	$ 60.90	$ 945.00	$ -	15.5	15.5
55LED	Toilet rooms	1	2T 17 R F 3 (ELE)	F23ILL	47	0.0	OCC	1000	47	1	2T 25 R LED	2RTLED	25	0.0	None	1,000	25	22	0.0	$ 3.52	$ 202.50	$ 50	57.5	43.3
198LED	Toilet room	1	2T 17 R F 2 (ELE)	F22LL	31	0.0	OCC	1000	31	1	2T 25 R LED	2RTLED	25	0.0	None	1,000	25	6	0.0	$ 0.96	$ 202.50	$ 50	210.9	158.9
35LED	Offices	7	T 32 R F 3 (ELE)	F43ILL/2	90	0.6	OCC	2400	1,512	7	T 59 R LED	RTLED38	38	0.3	None	2,400	638	874	0.4	$ 126.02	$ 1,653.75	$ -	13.1	13.1
55LED	Meeting Room	6	2T 17 R F 3 (ELE)	F23ILL	47	0.3	SW	1200	338	6	2T 25 R LED	2RTLED	25	0.2	OCC	1,000	150	188	0.1	$ 28.62	$ 1,343.25	$ 320	46.9	35.8
97	Break Room / Lounge	8	EP 13 R CF 2	CFQ13/2-L	28	0.2	SW	3102.5	695	8	EP 13 R CF 2	CFQ13/2-L	28	0.2	OCC	1,500	336	359	0.0	$ 47.74	$ 128.25	$ 20	2.7	2.3
41LED	Break Room / Lounge	6	1B 40 R F 2 (MAG)	F42SS	94	0.6	SW	3102.5	1,750	6	4 ft LED Tube	2007/2x2	30	0.2	OCC	1,500	270	1,480	0.4	$ 207.18	$ 1,530.45	$ 20	7.4	7.3
55LED	Main Garage Area	3	2T 17 R F 3 (ELE)	F23ILL	47	0.1	SW	5000	705	3	2T 25 R LED	2RTLED	25	0.1	None	5,000	375	330	0.1	$ 45.67	$ 607.50	$ 150	13.3	10.0
40LED	Boiler Room	2	T 32 R F 2 (ELE)	F42LL	60	0.1	SW	1820	218	2	T 38 R LED	RTLED38	38	0.1	None	1,820	138	80	0.0	$ 11.84	$ 472.50	$ -	39.9	39.9
40LED	Large Storage area	8	T 32 R F 2 (ELE)	F42LL	60	0.5	SW	500	240	8	T 38 R LED	RTLED38	38	0.3	None	500	152	88	0.2	$ 16.46	$ 1,890.00	$ -	114.9	114.9
227LED	Exterior wallpack	11	70 W MH Wall Pack	MH70/1	95	1.0	SW	4368	4,565	11	FXLED18	FXLED18/1	18	0.2	None	4,368	865	3,700	0.8	$ 514.93	$ 4,655.48	$ 1,100	9.0	6.9
															0	#N/A								#VALUE!
															0	#N/A								#VALUE!
															0	#N/A								#VALUE!
															0	#N/A								#VALUE!
															0	#N/A								#VALUE!
S	**Total**	**127**				**8.1**			**26,160**	**127**				**4.3**			**12,539**		**3.8**	**1,915**	**30,993**	**$2,165**		
S																		**Demand Savings**		**3.8**	**$104**			
S																		**kWh Savings**		**13,621**	**$1,812**			
S																		**Total Savings**			**$1,915**		**16.2**	**15.1**

APPENDIX D

New Jersey Board of Public Utilities Incentives

i. **Smart Start**

ii. **Direct Install**

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

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

I. SMART START

NJ SmartStart Buildings

Program Overview

With New Jersey SmartStart Buildings ...

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

Special Notice

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

Visit the Sandy web page for details and important links.

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

- Project Categories
- Custom Measures
- Incentives for Qualifying Equipment and Projects
- Program Terms and Conditions
- Find a Trade Ally

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

Getting Started

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

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

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

Support for Custom Energy-Efficiency Measures

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

Incentives for Qualifying Equipment and Projects

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

Find out more about equipment incentives

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

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COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

EQUIPMENT INCENTIVES

FOOD SERVICE EQUIPMENT

APPLICATION FORMS

TOOLS AND RESOURCES

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

Home » Commercial & Industrial » Programs » NJ SmartStart Buildings

Equipment Incentives

Special Notice

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

Visit the Sandy web page for details and important links.

More reasons for a smart start on your next project!

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

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

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

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

Electric Chillers

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

Gas Cooling

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

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

Desiccant Systems ($1.00 per cfm - gas or electric)

Electric Unitary HVAC

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

Ground Source Heat Pumps

Closed Loop ($450-750 per ton)

Gas Heating

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

Variable Frequency Drives

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

Natural Gas Water Heating

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

Premium Motors

Three-phase motors ($45 - $700 per motor) **(Incentive was discor effective March 1, 2013 except for buildings impacted by Hurri Sandy. Approved applications will have the standard timefram year from the program commitment date to complete the instal**

Refrigerator/Freezer Case Premium Efficiency Motors (ECM)

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

Prescriptive Lighting

New Linear Fluorescent

- T-12, HID and Incandescent to T-5 and T-8 ($25 - $200 p fixture) **(Note: T12 replacements are only available for buildings impacted by Hurricane Sandy)**
- New Induction ($70 per replaced HID fixture)
- New LED
  - Screw-in/Plug-in ($10 - $20 per lamp)
  - Refrigerator/Freezer Case ($30 - $65 per fixture)
  - Outdoor pole/arm/wall-mounted luminaires ($100 - $175 p fixture)
  - Display case ($30 per case)
  - Shelf-mounted display and task ($15 per linear foot)
  - Wall-wash, desk, recessed ($20 - $35 per fixture)
  - Parking garage luminaires ($100 per fixture)
  - Track or Mono-Point directional ($50 per fixture)
  - Stairwell and Passageway luminaires ($40 per fixture)
  - High-Bay, Low-Bay ($150 per fixture)
  - Bollard ($50 per fixture)
  - luminaires for Ambient Lighting of Interior Commercial Spa *Linear panels ($50 per fixture)*
  - Fuel pump canopy ($100 per fixture)
  - LED retrofit kits (custom measures)
- New Pulse-Start Metal Hallide ($25 per fixture)
- Linear Fluorescent Retrofit ($10 - $20 per fixture)
- Induction Retrofit ($50 per retrofitted HID fixture)
- New Construction/Complete Renovation (performance-based)

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

Lighting Controls

- Occupancy Sensors
  - Wall mounted ($20 per control)
  - Remote mounted ($35 per control)
  - Daylight dimmers ($25 per fixture controlled, $50 per fixtu office applications only)
  - Occupancy controlled hi-low fluorescent controls ($25 per controlled)
- HID or Fluorescent Hi-Bay Controls
  - Occupancy hi-low ($35 per fixture controlled)
  - Daylight dimming ($45 per fixture controlled)

Refrigeration

- Covers and Doors
  - Energy-Efficient doors for open refrigerated doors/covers per door)
  - Aluminum Night Curtains for open refrigerated cases ($3.5 linear foot)
- Controls
  - Door Heater Control ($50 per control)
  - Electric Defrost Control ($50 per control)
  - Evaporator Fan Control ($75 per control)
  - Novelty Cooler Shutoff ($50 per control)

Food Service Equipment

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

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

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

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

Other Equipment Incentives*

- Performance Lighting ($1.00 per watt per square foot below progra incentive threshold, currently 5% more energy efficient than ASHR/ 2007 for New Construction only.)
- Custom electric and gas equipment incentives (not prescriptive)

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

II. DIRECT INSTALL

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

PARTICIPATION STEPS

PARTICIPATING CONTRACTORS

SUSTAINABLE JERSEY

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

Direct Install

NEW JERSEY'S CLEAN ENERGY PROGRAM
DIRECT Install

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

Sometimes, the biggest challenge to improving energy efficiency is knowing where t and how to get through the process. Created specifically for existing small to mediun facilities, Direct Install is a turnkey solution that makes it easy and affordable to upgr high efficiency equipment. Direct Install is designed to cut your facility's energy costs replacing lighting, HVAC and other outdated operational equipment with energy effic alternatives. The program pays up to 70% of retrofit costs, dramatically improving yo payback on the project. There is a $125,000 incentive cap on each project.

ELIGIBILITY

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

SYSTEMS & EQUIPMENT ADDRESSED BY THE PROGRAM

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

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

III. PAY FOR PERFORMANCE (P4P)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

EXISTING BUILDINGS

PARTICIPATION STEPS

APPLICATIONS AND FORMS

APPROVED PARTNERS

NEW CONSTRUCTION

FAQS

BECOME A PARTNER

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

DIRECT INSTALL

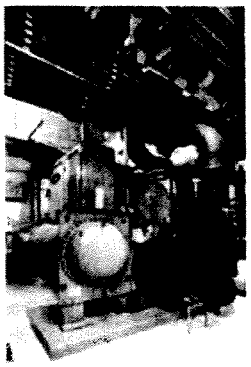
ENERGY BENCHMARKING

Pay for Performance - Existing Buildings

Download program applications and incentive forms.

The Greater the Savings, the Greater Your Incentives

Take a comprehensive, whole-building approach to saving energy in your existing facilit earn incentives that are directly linked to your savings. Pay for Performance relies on a program partners who provide technical services under direct you. Acting as your energy expert, your partner will develop a reduction plan for each project with a whole-building technica component of a traditional energy audit, a financial plan for fu energy efficient measures and a construction schedule for ins



Eligibility

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

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

ENERGY STAR Portfolio Manager

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

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

Incentives

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

PAST PROGRAMS

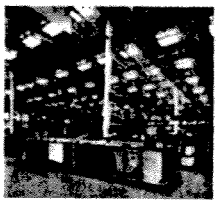
TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

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

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



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

Incentive #3 - Completion of Post-Construction Benchmarking Report - A completed report verifying energy reductions based on one year of post-implementation results. Incentives for electricity and natural gas savings will be based on actual savings, provided that the minimum performance threshold of savings has been achieved.

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

Steps to Participation

Click here for a step-by-step description of the program.

Home | Residential | Commercial & Industrial | Renewable Energy
About Us | Press Room | Library | FAQs | Calendar | Newsletters | Contact Us | Site

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

BPU New Jersey Board of Public Utilities

PAY FOR PERFORMANCE APPLICATION FORM

July 1, 2013 - June 30, 2014

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

Instructions

1. Read the program material to determine project qualification.
2. Read the Participation Agreement and sign where indicated.
3. Fill out all applicable spaces on this form.
4. Provide a copy of the customer's company W-9 form.
5. Provide the most recent consecutive 12 month period of utility bills for the project.
6. Provide brief description of facility.
7. Partner must submit the application package via e-mail, mail or fax DIRECTLY to the Market Manager – see back of this form.

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

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

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

Partner Information

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

Project Information

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

Funding

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

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

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

Additional Project information

Additional Utility Account(s)

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

Additional Comments:

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

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

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

Visit our website: NJCleanEnergy.com/P4P

Pay For Performance-Existing Buildings

Participation Agreement

Definitions:

Design Incentives – Incentives that may be offered to design professionals by the Program.

Design Services – Services that may be offered to design professionals under the Program.

Energy-Efficient Measures – Any device eligible to receive a Program Incentive payment through the NJ Clean Energy Commercial and Industrial Program (New Jersey SmartStart Buildings).

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

Administrator – New Jersey Board of Public Utilities, Office of Clean Energy

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

Product Installation or Equipment Installation – Installation of the Energy-Efficient Measures.

Projects with a contract threshold of $14,187 (increasing to $15,444 effective July 1, 2014) are required to pay no less than prevailing wage rate to workers employed in the performance of any construction undertaken in connection with Board of Public Utilities financial assistance, or undertaken to fulfill any condition of receiving Board of Public Utilities financial assistance, including the performance of any contract to construct, renovate or otherwise prepare a facility, the operations of which are necessary for the receipt of Board of Public Utilities financial assistance. By submitting an application, or accepting program incentives, applicant agrees to adhere to New Jersey Prevailing Wage requirements, as applicable.

Program – The Commercial and Industrial Energy-Efficient Construction Program (New Jersey SmartStart Buildings) offered herein by the New Jersey Board of Public Utilities, Office of Clean Energy pursuant to state regulatory approval under the New Jersey Electric Discount and Energy Competition Act, NJSA 48:3-49, et seq.

Program Incentives – Refers to the amount or level of incentive that the Program provides to Participating Customers pursuant to the Program offered herein (see description under "Incentive Amount" heading).

Program Offer – Program Incentives are available to non-residential retail electric and/or gas service customers of the New Jersey Utilities identified above.

Program Manager – TRC Energy Services.

Application and Eligibility Process – The Program pays incentives after the installation of qualified energy-efficient measures that were pre-approved (for exceptions to this condition, please refer to "Exceptions for Approval".) In order to be eligible for Program Incentives, a Customer, or an agent (contractor/vendor) authorized by a Customer, must submit a properly completed application package. The package must include an application signed by the customer; a complete (current) utility bill; and technology worksheet and manufacturer's cut sheets (where appropriate). This information must be submitted to the Program Manager before equipment is installed. Applications for measures that are self installed by customers must be submitted by the customer and not the sales vendor of the measure, however, the customer may elect to assign payment of the incentive to the sales vendor. This application package must be received by the Program Manager on or before June 30, 2014 in order to be eligible for the fiscal year July 1, 2013-June 30, 2014 incentives. The Program Manager will review the application package to determine if the project is eligible for a Program Incentive. If eligible, the Customer will receive an approval letter with the estimated authorized incentive amount and the date by which the equipment must be installed in order for the approval to remain in effect. Upon receipt of an approval letter, the Customer may then proceed to install the equipment listed on the approved application. Equipment installed prior to the date of the Program Manager's approval letter is not eligible for an incentive. The Program Manager reserves the right to conduct a pre-inspection of the facility prior to the installation of equipment. This will be done prior to the issuance of the approval letter. All equipment must be purchased within 12 months of date of application. **Any Customer and/ or agent who purchases equipment prior to the receipt of an incentive approval letter does so at his/her own risk.**

Exceptions for Approval – The Application and Eligibility Process pertains to all projects except for those involving either Gas Heating, Unitary HVAC or Motors having an incentive amount less than $5,000 that were installed within 12 months of receipt of the application. These measures, at this incentive level, may be installed without prior approval. In addition, but at the sole discretion of the Program Manager, emergency replacement of equipment may not require a prior approval determination and letter. **In such cases, please notify the Program Manager of such emergencies as early as possible, that an application will soon be sent in that was not pre-approved.**

Post-Installation Approval – After installation is completed, the Customer, or an agent authorized by the Customer, must finalize and submit an invoice for the purchase of the equipment (material cost must be broken out from labor costs), and any other required documentation as specified on the equipment application or in the Program Manager's initial approval letter.

Please refer to the program guide on the NJCleanEnergy.com/ssb website for the complete Application and Eligibility Process.

The Program Manager reserves the right to verify sales transactions and to have reasonable access to Participating Customer's facility to inspect both pre-existing product or equipment (if applicable) and the Energy-Efficient Measures

installed under this Program, either prior to issuing incentives or at a later time.

Energy-Efficient Measures must be installed in buildings located within a New Jersey Utilities' service territory and designated on the Participating Customer's incentive application. Program Incentives are available for qualified Energy-Efficient Measures as listed and described in the Program materials and incentive applications. The Participating Customer must ultimately own the equipment, either through an up-front purchase or at the end of a short-term lease. Design Incentives are available to design professionals as described in the Program materials and applications. A different and separate agreement must be executed by participating design professionals to be eligible for this type of incentive. The design professional does not need to be based in New Jersey.

Equipment procured by Participating Customers through another program offered by New Jersey's Clean Energy Program or the New Jersey Utilities, as applicable, is not eligible for incentives through this program. Customers who have not contributed to the Societal Benefits Charge of the applicable New Jersey Utility are not be eligible for incentives offered through this program.

Incentive Amount – Program Incentives will equal either: a) the approved Program Incentive amount, or b) the actual equipment cost of the Energy-Efficient Measure, whichever is less, as determined by the Program Manager. Products offered at no direct cost to the customer are ineligible. Incomplete application submissions, applications requiring inspections and unanticipated high volume of activities may cause processing delays. Program Incentives are limited to $500,000 per utility account in a calendar year. Contact the Program Manager regarding any questions.

Tax Liability – The Program Manager will not be responsible for any tax liability that may be imposed on any Participating Customer as a result of the payment of Program Incentives. All Participating Customers must supply their federal tax identification number or social security number to the Program Manager on the application form in order to receive a Program Incentive. In addition, Participating Customers must also provide a Tax Clearance Form (entitled "Business Assistance or Incentive Clearance Certificate") that is dated within 90 days of equipment installation.

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

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

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

Assignment – The Participating Customer may assign Program Incentive payments to a specified vendor.

Participating Customer's Certification – Participating Customer certifies that he/she purchased and installed the equipment listed in their application at their defined New Jersey location. Participating Customer agrees that all information is true and that he/she has conformed to all of the Program and equipment requirements listed in the application.

Termination – The New Jersey Board of Public Utilities reserves the right to extend, modify (this includes modification of Program Incentive levels) or terminate this Program without prior or further notice.

Acknowledgement – I have read, understood and am in compliance with all rules and regulations concerning this incentive program. I certify that all information provided is correct to the best of my knowledge, and I give the Program Manager permission to share my records with the New Jersey Board of Public Utilities, and contractors it selects to manage, coordinate or evaluate the NJ SmartStart Buildings Program. Additionally, I allow reasonable access to my property to inspect the installation and performance of the technologies and installations that are eligible for incentives under the guidelines of New Jersey's Clean Energy Program.

CUSTOMER'S SIGNATURE
PARTNER SIGNATURE
By signing, I certify that I have read, understand and agree to the Participation Agreement listed above.

IV. ENERGY SAVINGS IMPROVEMENT PLAN (ESIP)

COMMERCIAL, INDUSTRIAL AND LOCAL GOVERNMENT

HURRICANE SANDY

PROGRAMS

NJ SMARTSTART BUILDINGS

PAY FOR PERFORMANCE

COMBINED HEAT & POWER AND FUEL CELLS

LOCAL GOVERNMENT ENERGY AUDIT

LARGE ENERGY USERS PROGRAM

ENERGY SAVINGS IMPROVEMENT PROGRAM

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OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

CONTACT US

Home » Commercial & Industrial » Programs

Energy Savings Improvement Program

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

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

Local Government
School Districts (K-12)

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

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings
Procedures for Implementation

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

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

FIRST STEP – ENERGY AUDIT

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

ENERGY REDUCTION PLANS

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

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

ESIP PROGRAM

Final version 42413

BPU RULES

1. Public Entity must decide if they will use an ESCO or DIY method or Hybrid thereof prior to issuing the RFP and the RFP must state the intended method. A change in the project procurement model after the RFP closing date will be cause for immediate rejection and disqualification of potential Clean Energy program incentives.

2. RFP procedures shall be adhered to as per the legislation, including the use of BPU approved forms. Any alteration of the forms, without prior approval from the BPU shall be grounds for rejection.

3. RFP must include copy of an audit (ASHRAE Level II w/Level III for lighting) and audit must be prepared by a firm classified by DPMC in the 036 discipline.

4. All firms, including professional services, whether using ESCO or DIY model, must be DPMC classified.

5. If an Architect is engaged by the public entity, the architectural fees are the responsibility of the public entity and must be paid directly to the firm. These fees may be included in the energy cost savings analysis and payback.

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

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

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

7. There shall be no negative cash flow in any year of the program.
   section 7 (1)(a)
   > "the energy savings resulting from the program will be sufficient to cover the cost of the program's energy conservation measures."

8. SREC values are not permitted to be used in the energy cost savings calculations.

9. Capital cost avoidance values are not to be used in the energy savings calculations.

10. Operational and Maintenance (O&M) cost savings may be permitted in the cost savings calculations, but only with supporting documentation.

11. Blended utility rates shall not be permitted. Use the actual utility tariff or local contracted rates if there is a third party supplier.

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

12. Contracted third party utility rates may only be used for the term of the contract (5 yr. maximum) Subsequent years are to be projected at the utility tariff rates plus the annual BPU escalation rates.

13. Public entity shall conduct M&V (measurement and verification) at the one (1) year operational date and shall provide a copy of the M&V report to the Board of Public Utilities.

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

14. The decisions made by BPU staff regarding compliance or other issues that arise in connection with the RFP procurement process shall be considered a final decision of the BPU. Any appeal will need to be through the New Jersey Superior Court, Appellate Division.

15. For the RFP proposals only, Demand Response (DR) revenues claimed by ESCO's can only be projected for a maximum period of three (3) years. DR revenue projections beyond three years will not be permitted. DR revenues must be included and presented under the "Energy Rebates/Incentives" column of FORM VI.

16. ESCO "fees" proposed during the RFP phase of the project cannot increase post-award. ESCO's are required to maintain the fee percentages through final contract negotiations and construction of the Board approved Energy Savings Plan

17. Public Bid openings shall be held on the due date of the proposal submissions. The public entity shall announce the name of the bidder and the total dollar amount. After award of a contract, all proposals received will be made available by the owner for public inspection

18. Rejection of bids by the public entity shall be conducted in accordance with the appropriate sections of the applicable legislation, as stated in Title 40A:11-13.2. Additionally all proposals must be returned to the respective ESCO's upon rejection.

19. Field changes that exceed 5% of the project cost require BPU approval.

20. Energy Savings Plans (ESP) that is dependent upon incentives from the Clean Energy Program must review the current program requirements, at the time of application, for each incentive to insure eligibility. If any program incentive is denied, resubmission of all ESIP related forms will be necessary to remain ESIP qualified.

1: Senior Center/Public Safety Building

2: Front entrance to the Senior Center

2: Public Safety Building access from Main Street

APPENDIX E

Photovoltaic Analysis

APPENDIX F

Photos

4: (2) hot water boilers that serve the building

5: DHW heater and adjacent storage tank

6: Existing rooftop unit serves the Public Safety break room and meeting room

APPENDIX G

EPA Benchmarking Report

ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

Senior Center & Public Safety Building

Primary Property Function: Other
Gross Floor Area (ft²): 15,000
Built: 1980

For Year Ending: March 31, 2014
Date Generated: September 09, 2014

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Senior Center & Public Safety Building 95 Main Street Little Ferry, New Jersey 07643	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4143596

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
109.9 kBtu/ft²

Source EUI
134.3 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	138,148 (8%)
Natural Gas (kBtu)	1,412,939 (86%)
Electric - Solar (kBtu)	97,310 (6%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	100.7
National Median Source EUI (kBtu/ft²)	123.1
% Diff from National Median Source EUI	9%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	106

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____Date: _____

Licensed Professional

____ _____
,
(____)____-_____
_____

Professional Engineer Stamp (if applicable)