WILLIAM PATTERSON UNIVERSITY

REC CENTER

300 Pompton Road, Wayne NJ 07470

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

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CHA PROJECT NO. 28661

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REPORT DISCLAIMER

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

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

List of Common Energy Audit Abbreviations

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

1.0 EXECUTIVE SUMMARY

This report summarizes the energy audit performed by CHA for William Patterson University (WPU) 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
Rec Center	300 Pompton Road, Wayne NJ 07470	44,000	1982

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)
Rec Center	72,576	1,769	16,197	17.5

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

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

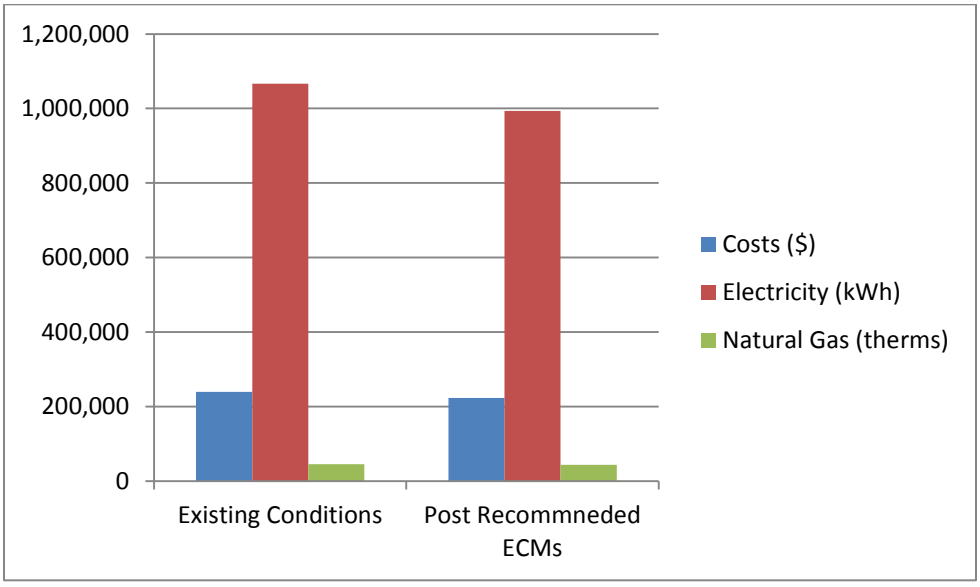
Summary of Energy Conservation Measures

ECM #	Energy Conservation Measure	Est. Costs ($)	Est. Savings ($/year)	Payback w/o Incentive	Potential Incentive ($)*	Payback w/ Incentive	Recommended
ECM-1	Utilize Economizer Mode on the RTUs	78,200	4,606	17.0	0	17.0	Y
ECM-2	Install Demand Control Ventilation on the RTUs	39,400	1,235	31.9	0	31.9	Y
ECM-3	Install Programmable Thermostats for all the RTUs to Reset Temperature	10,818	1,234	8.8	0	8.8	Y
ECM-4	Install Vending Misers	1,120	1,688	0.7	0	0.7	Y
ECM-5	Replace High Flow Plumbing Fixtures with Low Flow Plumbing Fixtures	109,389	752	145.5	0	145.5	Y
ECM-L1**	Lighting Replacements / Upgrades	42,980	6,573	6.5	5,410	5.7	N
ECM-L2**	Install Lighting Controls (Add Occupancy Sensors)	1,890	239	7.9	245	6.9	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	44,870	6,682	6.7	5,655	5.9	Y
	Total**	283,797	16,197	17.5	5,655	17.2	
	Total (Recommended)	283,797	16,197	17.5	5,655	17.2	

* Incentive shown is per the New Jersey SmartStart Program.
** These ECMs are not included in the Total, as they are alternate measures not recommended.

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	239,203	223,006	7%
Electricity (kWh)	1,066,364	993,788	7%
Natural Gas (therms)	45,311	43,542	4%
Site EUI (kbtu/SF/Yr)	185.7	176.0	



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: Rec Center
Address: 300 Pompton Road, Wayne NJ 07470
Gross Floor Area: 44,000
Number of Floors: 1
Year Built: 1982

Building Envelope

Description of Spaces: The building is a multipurpose athletic facility. It includes gymnasium, weight room, racquet ball rooms, offices, storage rooms, restrooms and locker rooms.
Description of Occupancy: The occupancy of the building varies with the school year and event schedule.
Number of Computers: The building has approximately 6 desktop and laptop computers.
Building Usage: The building operates approximately 51 weeks per year.
Construction Materials: The building is constructed of concrete block with steel siding façade.
Roof: The building has a flat roof which is covered with grey rubber membrane. It is believed that the roof is well insulated. The roof is in good condition and no ECMs associated with roof replacement.
Windows: The windows in this building are double pane windows. The windows are in good condition and therefore no ECM is associated with window replacement.
Exterior Doors: Exterior doors throughout the school are aluminum frame with safety glass. Sweeps on exterior doors are still in good condition and therefore no ECM related to door seals is evaluated.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: The majority of the building is heated by five (5) roof top units (RTU) equipped with gas furnace. The gymnasium is served by two McQuay RTUs and each of the RTUs has a 2,500 MBH gas fired furnace. One McQuay RTU serves the weight room and multipurpose room and a Trane RTU serves the common areas and locker rooms. Also, there is a brand new Daikin RTU serves the racquet ball room. The RTUs are listed in the table below:

Type	No.	Manufacturer	Component	Heating Capacity	Serve Area
RTU	1	McQuay	RTU with DX Cooling and Gas Furnance	~ 2500 MBH max input Heating Capacity	Gymnasium
RTU	1	McQuay	RTU with DX Cooling and Gas Furnance	~ 2500 MBH max input Heating Capacity	Gymnasium
RTU	1	McQuay	RTU with DX Cooling and Gas Furnance	Unknown Heating Capacity	Weight Room and Multipurpose Room
RTU	1	Trane	RTU with DX Cooling and Gas Furnance	~130 MBH	Common Areas and Locker Rooms
RTU	1	Daikin	RTU with DX Cooling and Gas Furnance	Unknown Heating Capacity	Racquet Ball Room

Apart from the RTUs, there is a heating ventilation (HV) unit equipped with a small electric heater serving the common areas in the office area. The four office rooms are heated by four Carrier packaged terminal heat pump (PTHP) units.

Cooling: The majority of the building is cooled by the same five RTUs supplying heating for the building. The cooling capacities of the RTUs are listed below:

Type	No.	Manufacturer	Component	Cooling Capacity	Serve Area
RTU	1	McQuay	RTU with DX Cooling and Gas Furnance	~75 ton	Gymnasium
RTU	1	McQuay	RTU with DX Cooling and Gas Furnance	~75 ton	Gymnasium
RTU	1	McQuay	RTU with DX Cooling and Gas Furnance	~30 ton	Weight Room and Multipurpose Room
RTU	1	Trane	RTU with DX Cooling and Gas Furnance	~20 ton	Common Areas and Locker Rooms

RTU	1	Daikin	RTU with DX Cooling and Gas Furnance	~20 ton	Racquet Ball Room

Apart from the RTUs, there are four Carrier PTHP units serving the four office rooms. After discussing with the staff, it is believed that each of the PTHP unit has an approximately cooling capacity of 1 ton. An ECM related to utilize economizer mode is evaluated.

Ventilation: The majority of the building is ventilated by the RTUs. The two RTUs serving the gymnasium has a maximum of 50,000 CFM supply air, however, the percentage of outdoor air is unknown. Similarly, the amount of the outdoor air provided by the other three RTUs is unknown. The office area is ventilated by a small HV unit which does not run often according to the staff. After discussing with the facility staff, it is believed that the no economizer mode or demand control ventilation (DCV) is utilized in these RTUs. Therefore, an ECM related to DCV is evaluated.

Exhaust: The exhaust of this building is provided by the RTUs. The RTUs are equipped with return air fans and exhaust dampers to provide air circulation and exhaustion. The exhaust system in the RTUs appears to be in good condition. Therefore, there is no ECM associated with exhaust system.

Controls Systems

The McQuay RTU serving the weight room and multipurpose room has a Trane programmable thermostat which set the cooling temperature at 68 ^{o}F during occupied hours and setback to 73^{o}F during unoccupied hours. The rest of the RTUs are controlled by timers located in the storage room and the PTHP units are controlled by manual controller built in the unit. An ECM related to change the existing controllers with programmable thermostats is evaluated.

Domestic Hot Water Systems

The facility has a gas fired domestic hot water heater which was not observed during the site visit due to inaccessibility to the room. It is believed that this heater is still in good condition and therefore, there is no ECM associated with DHW heaters.

Kitchen Equipment

There is no kitchen in this building; however, there are one Hobart refrigerator, one Beverage Air Freezer and one Manitowoc ice machine located in the office storage room. These is no ECM associated with kitchen equipment.

Plug Load

This building has computers, monitors TVs, residential appliances (microwave, refrigerator), portable electric heaters (personal) and vending machines which contribute to the plug load in the building. The installation of vending machine occupancy sensors has been evaluated in an effort to reduce the plug load in the building.

Plumbing Systems

The restrooms contain older style toilets and urinals that utilize a higher volume of water per flush (3.5 GPF) than currently available new units. The sink faucets are double handle type and do not appear to have low-flow type aerators, dispensing at 2.5 GPM. An ECM is included to evaluate the water savings potential of installing low- flow plumbing fixtures.

Lighting Systems

The building has a mixture of T-5, T-8 fluorescent lighting, and some compact fluorescent lights (CFL). The majority of lighting fixtures are T-8 fluorescent U-shape and linear fixtures. The gymnasium has high bay 54W T-5s and the restrooms have a few CFLs. The building also has ten metal halide fixtures as outdoor lights. All of the lights in this building are controlled by manual switches. We have provided three alternatives for lighting that include adding occupancy sensors to the existing lights, replacing the lights with LED lights and a third ECM that evaluates adding occupancy sensors to the proposed LED lights.

3.0 UTILITIES

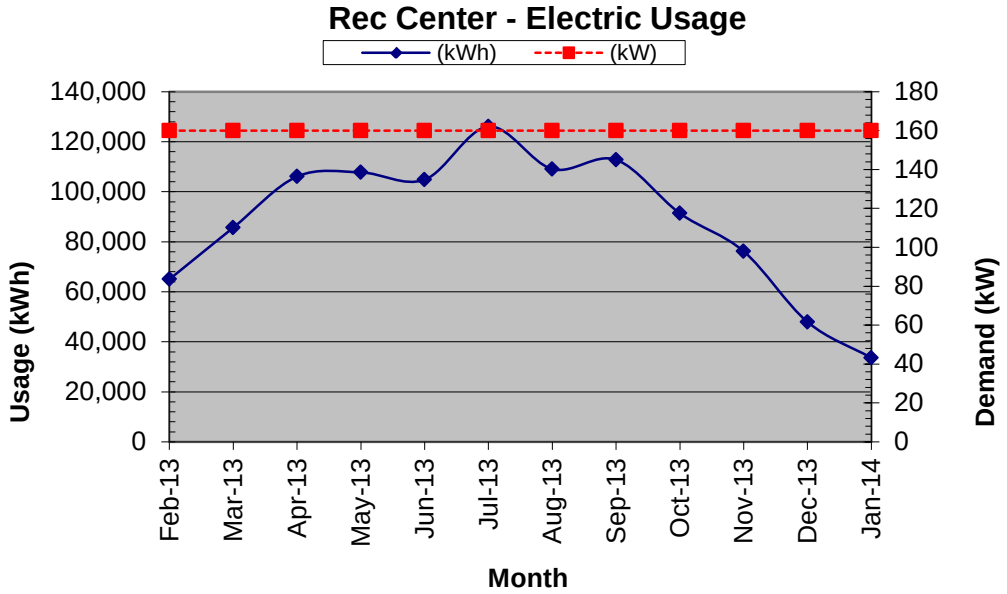
Natural gas and electricity are metered into this building under Account # 42-001-530-09. Utilities used by the building are delivered and supplied by the following utility companies:

	Electric	Natural Gas
Deliverer	PSE&G	PSE&G
Supplier	Direct Energy	HESS

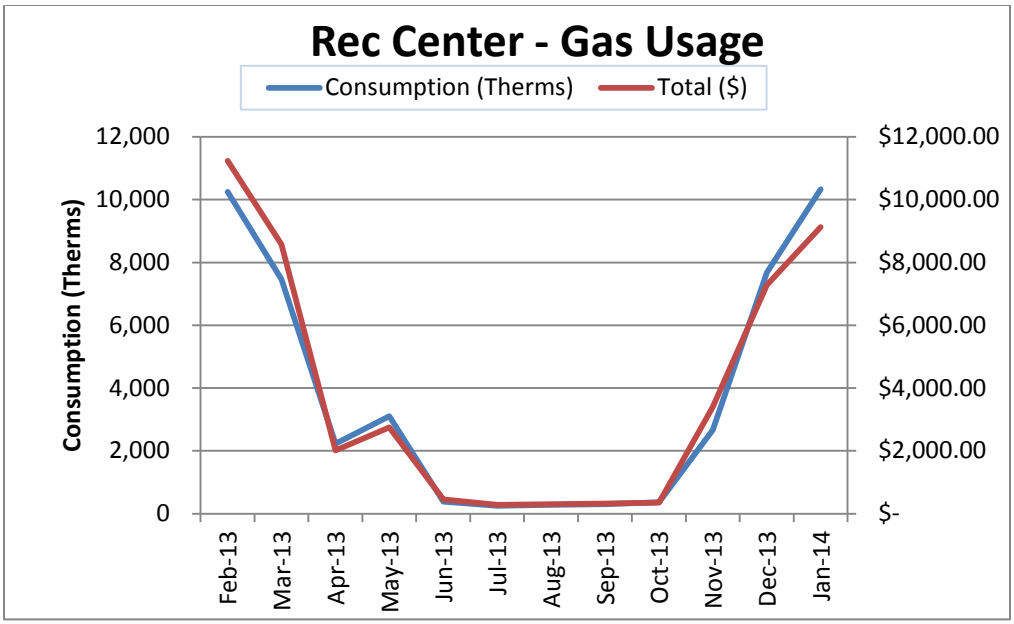
For the 12-month period ending in January 2014, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	1,066,364	kWh
Annual Cost	193,092	$
Blended Unit Rate	0.18	$/kWh
Supply Rate	0.16	$/kWh
Demand Rate	11.93	$/kW
Peak Demand	160.0	kW
Natural Gas		
Annual Consumption	45,311	Therms
Annual Cost	46,111	$
Unit Rate	1.02	$/therm

Blended Rate: Average rate charged determined by the annual cost / annual usage
Supply Rate: Actual rate charged for electricity usage in kWh (based on most recent electric bill)
Demand Rate: Rate charged for actual electrical demand in kW (based on most recent electric bill)
*Some months that do not have utility data and the missing demand usage are estimated and highlighted in the utility spreadsheet



The electric usage is higher during cooling season due to the running of the electric cooling equipment and lower in the heating season.



The natural gas usage in this building is for heating and domestic hot water heating. The gas usage in the non-heating season is for domestic hot water only and relatively small. The gas usage during the heating season is correlated to winter weather conditions.

See Appendix A for utility analysis.

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

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	School Average Rate	NJ Average Rate	
Electricity	$/kWh	$0.18	$0.13	Y
Natural Gas	$/Therm	$1.02	$0.96	Y

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

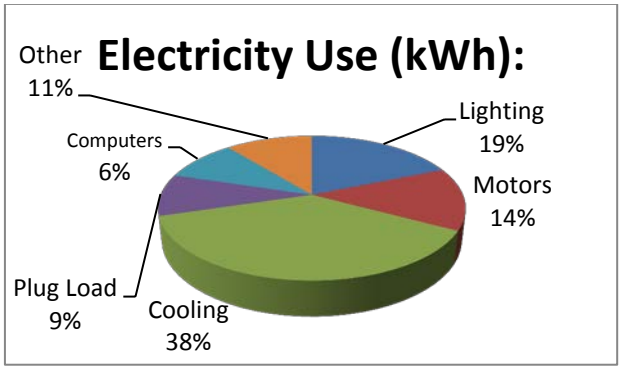
Additional information on selecting a third party energy supplier is available here:

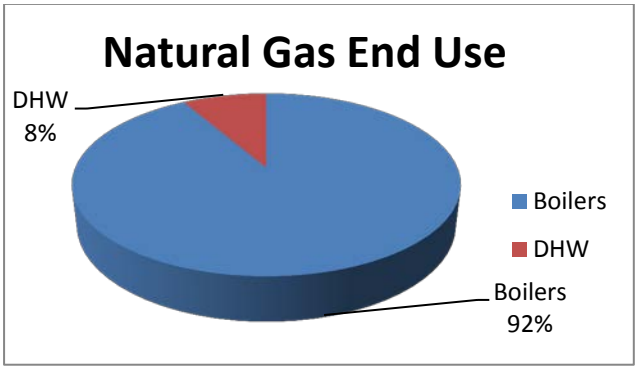
http://www.state.nj.us/bpu/commercial/shopping.html.

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

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

Site End-Use Utility Profile





4.0 BENCHMARKING

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

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

Site EUI kBtu/ft^2/yr	Source EUI (kBtu/ft^2/yr)	Energy Star Rating (1-100)
185.7	367.8	N/A

The building has higher EUIs than the national median EUIs (national median site EUI is 132.6 kBtu/ft^2 and national median source EUI is 262.6 kBtu/ft^2), and is considered a building needs improvements on energy consumption.

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 Utilize Economizer Mode on the RTUs

The majority of the building is ventilated by the RTUs. The two RTUs serving the gymnasium has a maximum of 50,000 CFM supply air. It is suggested to install outdoor air temperature, outdoor air damper actuators and control system to utilize outdoor air for free cooling or heating during the shoulder season. The air side economizer mode would reduce the energy consumption of the RTUs during the shoulder seasons.

It is estimated that the cooling hours could be reduced by 5% and the heating hours could be reduced by 3% after implementing the economizer mode.

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

ECM-1 Utilize Economizer Mode on the RTUs

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
78,200	0	18,553	1,226	4,606	(0.1)	0	17.0	17.0

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

This measure is recommended.

5.2 ECM-2 Install Demand Control Ventilation on the RTUs

The building has five RTUs. All systems are assumed to be designed to provide ventilation based on maximum occupancy. Maximum occupancy occurs infrequently and by reducing the amount of ventilation energy savings will result. Installation of carbon dioxide (CO2) sensors will allow for a reduction of outside air during periods of low occupancy. The quantity of ventilation air will be based on maintaining an acceptable CO_2 level in the space as an indicator of indoor air quality. A limit of 1000 PPM of CO_2 is recommended in ASHRAE Standard 62-2010, Ventilation for Acceptable Indoor Air Quality. Sensors will be installed to measure the building air CO_2 concentration, and the control sequence of operation changed. During unoccupied periods, the outside air dampers should be closed.

Bin weather data was utilized to obtain the annual operating hours required to maintain the current setpoint of 70°F. The BTU/Hr rating is calculated from the OA conditions and CFM. It is assumed that installing the controls will reduce the amount of OA to be conditioned by 20%. The annual thermal usage was estimated. The energy saving is the difference in natural gas usage for heating and electrical energy used for cooling.

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

ECM-2 Install Demand Control Ventilation on the RTUs

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
39,400	0	4,034	496	1,235	(0.5)	0	31.9	31.9

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

This measure is recommended.

5.3 ECM-3 Install Programmable Thermostats on RTUs

The existing four RTUs are controlled by a timer system and it was noted by the facility staff that this unit was kept running after the office hours. It is suggested that a programmable digital thermostat be installed to control the PTHP unit and reset the temperature during unoccupied hours. The new thermostat will be able to set a schedule for occupied and unoccupied setpoints. Savings are seen from temperature scheduling for occupied and unoccupied hours.

The cost of implementing this measure includes installing the programmable thermostats, wiring and the labor cost on doing programming on these new thermostats.

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

ECM-3 Install Programmable Thermostats on RTUs

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
10,818	0	6,765	10	1,234	0.7	0	8.8	8.8

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

This measure is recommended.

5.4 ECM-4 Install Vending Misers

Cold drink and snack vending machines are typically operating 24/7 regardless of occupancy. A Vending miser uses a passive infrared occupancy sensor technology to detect potential customers and cycles the compressors during unoccupied times to maintain desired product temperatures. This measure considered installing vending misers to save energy on (2) refrigerated machines and (2) dry product machines in the cafeteria.

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

ECM-4 Install Vending Misers

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
1,120	0	9,324	0	1,688	29.1	0	0.7	0.7

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

This measure is recommended.

5.5 ECM-5 Install Low Flow Plumbing Fixtures

The plumbing fixtures in this building are older high flow fixtures. The water savings associated from replacing existing high flow fixtures with low-flow fixtures was calculated by taking the difference of the annual water usage for the proposed and base case. The basis of this calculation is the estimate usage of each fixture, gallons per use, and number of fixtures. Replacing the existing fixtures in the restrooms with 1.28 Gals/flush toilets, 1.0 gal/flush urinals, and 0.5 gpm faucets will conserve water which will result in lower annual water and sewer charges. Facets with low-flow push valves were not considered for replacement.

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

ECM-5 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
109,389	0	0	37	95	752	(0.9)	0	145.5	145.5

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

This measure is recommended since the total payback of the all the ECMs in less than 15 years.

5.5.1 ECM-L1 Lighting Replacement / Upgrades

The existing lighting system consists of mostly T8 linear fluorescent fixtures which until recently represented the most efficient lighting technology available. Exterior lighting includes metal halide fixtures. Recent technological improvements in light emitting diode (LED) technologies have driven down the initial costs making it a viable option for installation.

Overall energy consumption can be reduced by replacing inefficient bulbs and linear fluorescent bulbs with more efficient LED technology. To compute the annual savings for this ECM, the energy consumption of the current lighting fixtures was established and compared to the proposed fixture power requirement with the same annual hours of operation. The difference between the existing and proposed annual energy

consumption was the energy savings. These calculations are based on 1 to 1 replacements of the fixtures, and do not take into account lumen output requirements for a given space. A more comprehensive engineering study should be performed to determine correct lighting levels.

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

ECM-L1 Lighting Replacement / Upgrades

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
42,980	9	33,220	0	6,573	0.7	5,410	6.5	5.7

* 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 not recommended in lieu of ECM L3.

5.5.2 ECM-L2 Install Lighting Controls (Occupancy Sensors)

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

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

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

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
1,890	0	1,492	0	239	0.4	245	7.9	6.9

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

This measure is not recommended in lieu of ECM L3.

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

This measure is a combination of ECM-L1 and ECM-L2; recommending replace/upgrade the current lighting fixtures to more efficient ones and installing occupancy sensors on the new lights. Interactive effects of the higher efficiency lights and occupancy sensors lead the energy and cost savings for this measure to not be cumulative or equivalent to

the sum of replacing the lighting fixtures alone and installing occupancy sensors without the lighting upgrade. The implementation cost and savings related to this ECM are presented in Appendix C and summarized below:

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
44,870	9	33,899	0	6,682	0.6	5,655	6.7	5.9

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

This measure is recommended.

5.6 Additional O&M Opportunities

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

- O&M-1 Replace air filters in all RTUs

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.

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

6.1.2 Direct Install Program

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

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

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

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

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

Refer to Appendix D for more information on this program.

6.1.3 New Jersey Pay For Performance Program (P4P)

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

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

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

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

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

Electric

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

Gas

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

Incentive cap: 25% of total project cost

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

Electric

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

Gas

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

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

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

6.1.4 Energy Savings Improvement Plan

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

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

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

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

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

6.1.5 Renewable Energy Incentive Program

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

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

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

7.0 ALTERNATIVE ENERGY SCREENING EVALUATION

7.1 Solar

7.1.1 Photovoltaic Rooftop Solar Power Generation

The building was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The amount of available roof area determines how large of a solar array can be installed on any given roof. Due to the fact that this building already has RTUs that takes up a majority of the roof space, a solar PV system was determined to not be feasible and not recommended.

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.

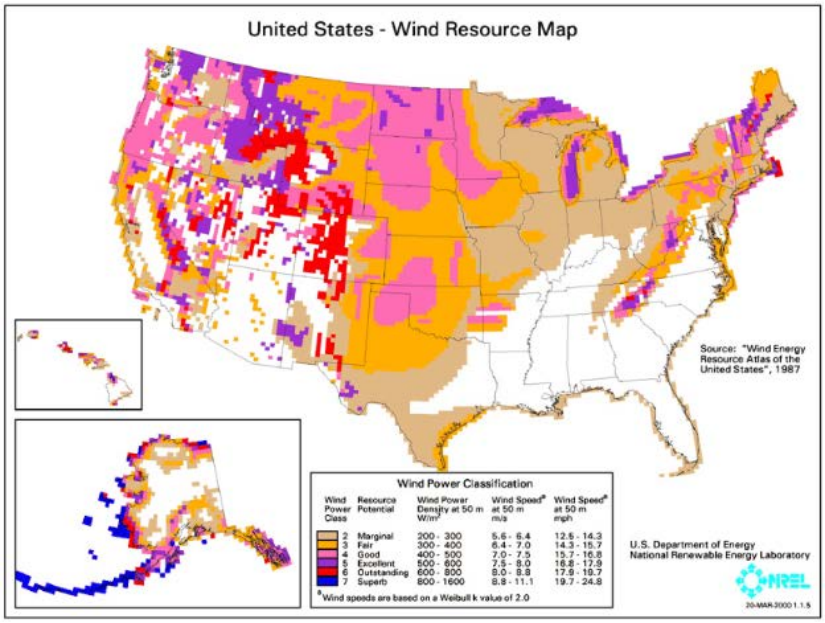
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping).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

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

Any proposed CHP project will need to consider many factors, such as existing system load, use of thermal energy produced, system size, natural gas fuel availability, and proposed plant location. The building has sufficient need for electrical generation and the ability to use most of the thermal byproduct during the winter; however thermal usage during the summer months does not exist. Thermal energy produced by the CHP

plant in the warmer months will be wasted. An absorption chiller could be installed to utilize the heat to produce chilled water; however, there is no chilled water distribution system in the building. CHP is not recommended due to the building's limited summer thermal demand.

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

A fuel cell system with recovery and productive use of waste heat is another alternative energy option viable in the market. A full analysis of all campus buildings would need to be completed to determine the economic viability. The several buildings included in the scope of work are not good candidates for CHP or Fuel cell technology based on their utility usage and geographic locations on their own relative to the main campus.

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 February 2013 through January 2014 the following table summarizes the electricity load profile for the building.

Building Electric Load Profile

Peak Demand kW	Min Demand kW	Avg Demand kW	Onsite Generation Y/N	Eligible? Y/N
160	160	160	N	Y

This measure is not recommended due to the lack of onsite generation.

8.0 CONCLUSIONS & RECOMMENDATIONS

The following section summarizes the LGEA energy audit conducted by CHA for the Campus Police building at William Patterson University.

The following projects should be considered for implementation:

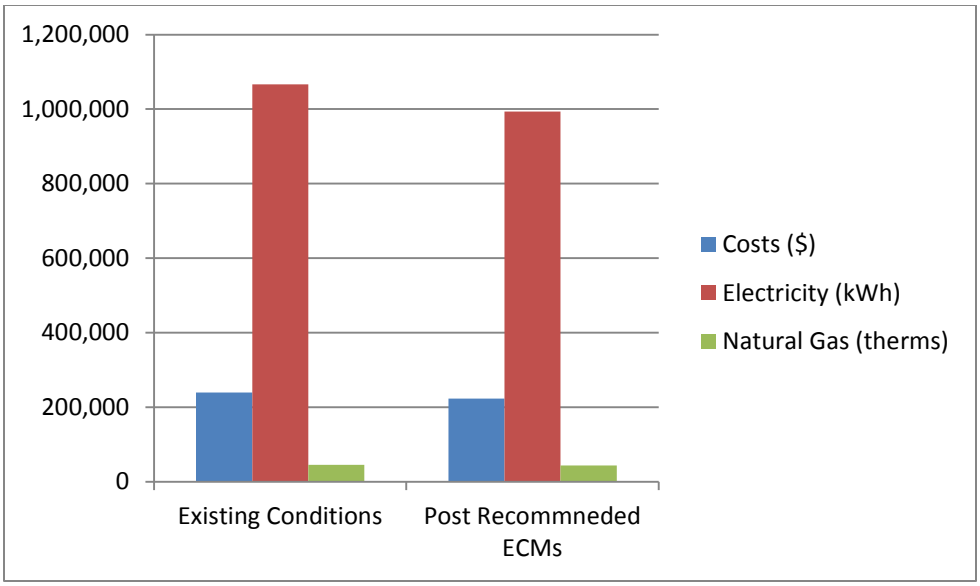
- Utilize Economizer Mode on the RTUs
- Install Demand Control Ventilation on the RTUs
- Install Programmable Thermostats for all the RTUs to Reset Temperature
- Install Vending Misers
- Replace High Flow Plumbing Fixtures with Low Flow Plumbing Fixtures
- Lighting Replacements with Controls (Occupancy 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)
72,576	1,769	16,197	17.5

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

	Existing Conditions	Post Recommended ECMs	Percent Savings
Costs ($)	239,203	223,006	7%
Electricity (kWh)	1,066,364	993,788	7%
Natural Gas (therms)	45,311	43,542	4%
Site EUI (kbtu/SF/Yr)	185.7	176.0	



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

APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

William Patterson University LGEA
Rec Center - Electric Usage

Annual Utilities

12-month Summary

Electric		
Annual Usage	1,066,364	kWh/yr
Annual Cost	193,092	$
Blended Rate	0.181	$/kWh
Consumption Rate	0.160	$/kWh
Demand Rate	11.93	$/kW
Peak Demand	160.0	kW
Min. Demand	160.0	kW
Avg. Demand	160.0	kW
Natural Gas		
Annual Usage	45,311	therms/yr
Annual Cost	46,111	$
Rate	1.018	$/therm

William Patterson University LGEA
Rec Center

Utility Bills: Account Numbers

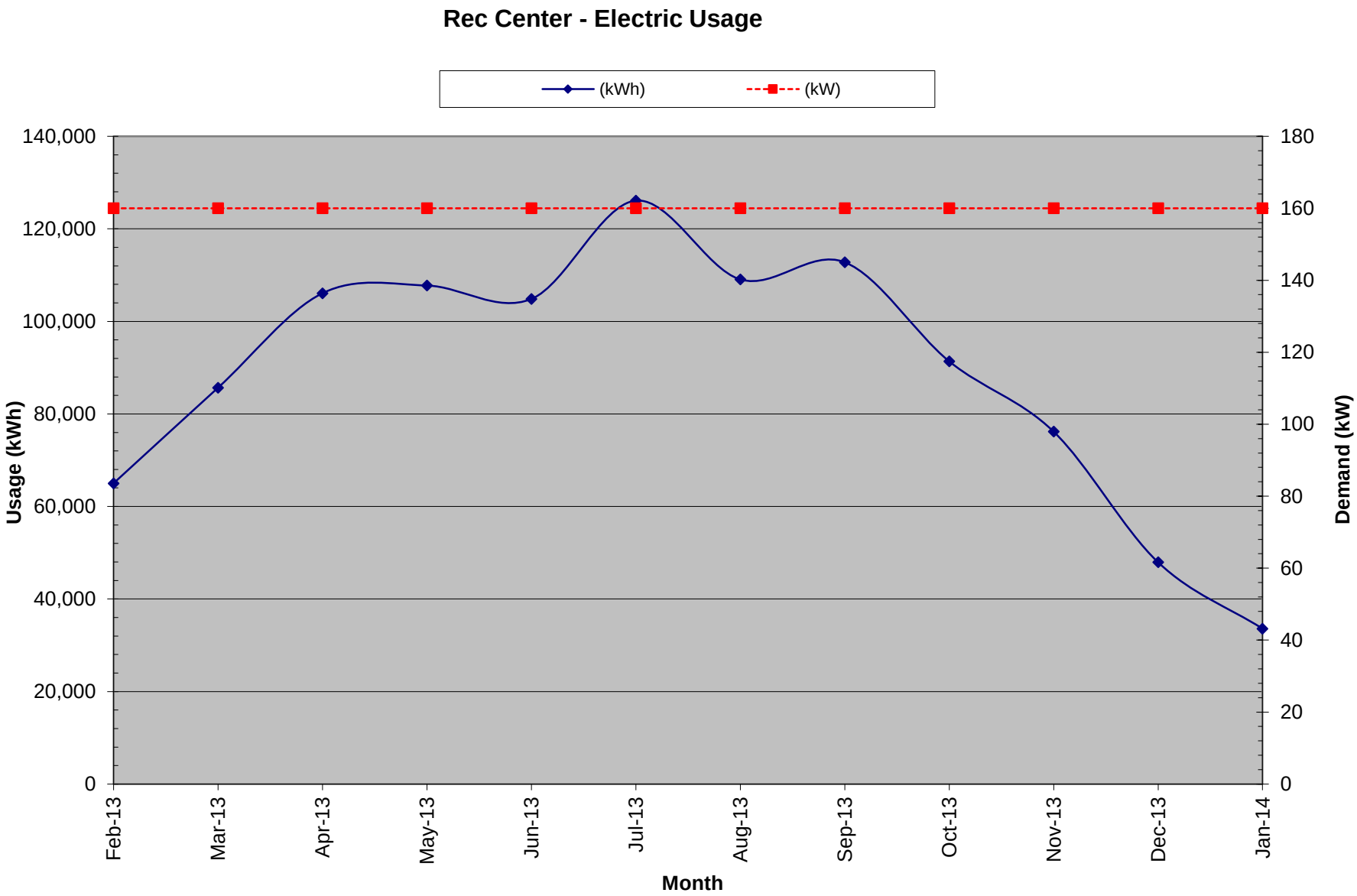
Account Number	Building Name	Location	Type	Notes
42-001-530-09	Rec Center	300 Pompton Road, Wayne NJ 07470	Electricity	
42-001-530-09	Rec Center	300 Pompton Road, Wayne NJ 07470	Natural Gas	

William Patterson University LGEA
Rec Center - Electric Usage

For Service at:
Account No.: **42-001-530-09** **Delivery -** **PSE&G**
Meter No.: **758000673** **Supplier -** **Direct Energy**
Electric Service

			Provider Charges			Usage (kWh) vs. Demand (kW) Charges		Unit Costs		
Month	**Consumption (kWh)**	**Demand (kW)**	**Delivery ($)**	**Supplier ($)**	**Total ($)**	**Consumption ($)**	**Demand ($)**	**Blended Rate ($/kWh)**	**Consumption ($/kWh)**	**Demand ($/kW)**
February-13	65,001	160.00	6,412.58	3,190.58	9,603.16	7,694.36	1,908.80	0.15	0.12	11.93
March-13	85,656	160.00	8,450.31	3,170.98	11,621.29	9,712.49	1,908.80	0.14	0.11	11.93
April-13	106,087	160.00	10,465.88	14,771.53	25,237.41	23,328.61	1,908.80	0.24	0.22	11.93
May-13	107,753	160.00	10,630.26	14,573.04	25,203.30	23,294.50	1,908.80	0.23	0.22	11.93
June-13	104,846	160.00	10,343.48	15,729.99	26,073.47	24,164.67	1,908.80	0.25	0.23	11.93
July-13	126,109	160.00	12,441.13	5,285.68	17,726.81	15,818.01	1,908.80	0.14	0.13	11.93
August-13	109,074	160.00	10,760.58	3,666.79	14,427.37	12,518.57	1,908.80	0.13	0.11	11.93
September-13	112,781	160.00	11,126.31	15,290.13	26,416.44	24,507.64	1,908.80	0.23	0.22	11.93
October-13	91,366	160.00	9,013.62	2,750.76	11,764.38	9,855.58	1,908.80	0.13	0.11	11.93
November-13	76,175	160.00	7,514.92	3,315.75	10,830.67	8,921.87	1,908.80	0.14	0.12	11.93
December-13	47,932	160.00	4,728.64	4,389.62	9,118.26	7,209.46	1,908.80	0.19	0.15	11.93
January-14	33,586	160.00	3,313.39	1,756.16	5,069.55	3,160.75	1,908.80	0.15	0.09	11.93
Total (All)	**1,066,364**	**160.00**	**$105,201.11**	**$87,891.00**	**$193,092.11**	**$170,186.51**	**$22,905.60**	**$0.18**	**$0.16**	**$11.93**
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 Estimated
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)

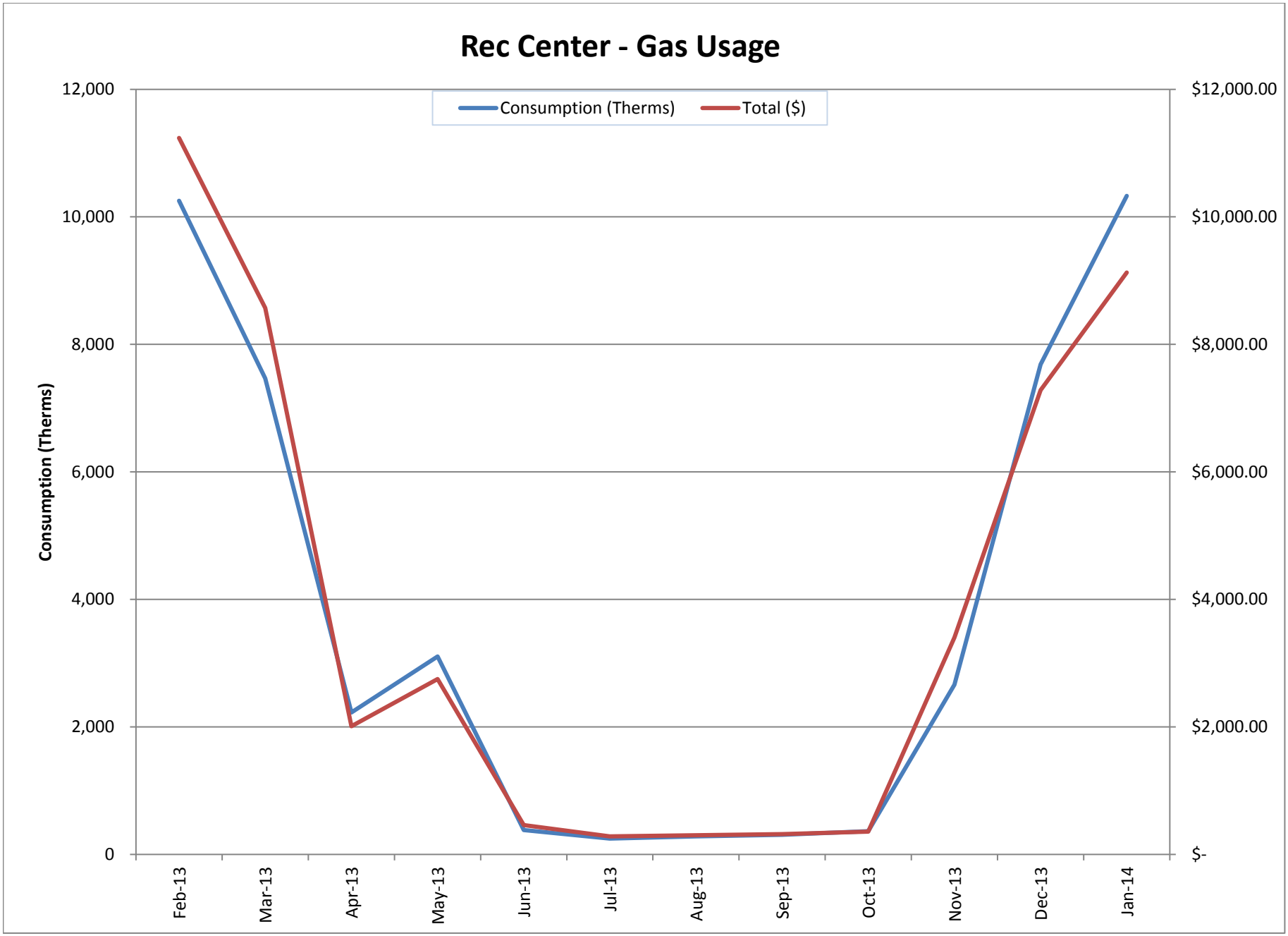


Rec Center Utility Data - YY
Electric Graph

William Patterson University LGEA
Rec Center - Gas Usage

For Service at:
Account No.: **67-583-442-07**
Meter No: **1792314**
Natural Gas Service **Delivery -** **PSE&G**
Supplier - **HESS**

		Charges			Unit Costs		
Month	**Consumption (Therms)**	**Delivery ($)**	**Supply ($)**	**Total ($)**	**Delivery ($/Therm)**	**Supply ($/Therm)**	**Total ($/Therm)**
February-13	10,252	$ 5,514.65	$ 5,723.60	$ 11,238.25	$ 0.538	$ 0.558	$ 1.096
March-13	7,466	$ 4,404.33	$ 4,168.35	$ 8,572.68	$ 0.590	$ 0.558	$ 1.148
April-13	2,226	$ 769.21	$ 1,242.65	$ 2,011.86	$ 0.346	$ 0.558	$ 0.904
May-13	3,103	$ 1,018.02	$ 1,732.49	$ 2,750.51	$ 0.328	$ 0.558	$ 0.886
June-13	384	$ 244.99	$ 214.12	$ 459.11	$ 0.639	$ 0.558	$ 1.197
July-13	249	$ 144.53	$ 138.81	$ 283.34	$ 0.581	$ 0.558	$ 1.140
August-13	283	$ 144.81	$ 157.73	$ 302.54	$ 0.513	$ 0.558	$ 1.071
September-13	307	$ 148.32	$ 171.40	$ 319.72	$ 0.483	$ 0.558	$ 1.041
October-13	364	$ 155.25	$ 203.47	$ 358.72	$ 0.426	$ 0.558	$ 0.984
November-13	2,664	$ 1,916.17	$ 1,487.26	$ 3,403.43	$ 0.719	$ 0.558	$ 1.278
December-13	7,685	$ 2,992.39	$ 4,290.41	$ 7,282.80	$ 0.389	$ 0.558	$ 0.948
January-14	10,329	$ 3,361.16	$ 5,766.70	$ 9,127.86	$ 0.325	$ 0.558	$ 0.884
Total	**45,311.23**			**$ 46,110.82**			**$ 1.018**


Rec Center - Gas Usage
Consumption (Therms)
Total ($)
Consumption (Therms)
12,000
10,000
8,000
6,000
4,000
2,000
0
$12,000.00
$10,000.00
$8,000.00
$6,000.00
$4,000.00
$2,000.00
$-
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14

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**

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

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

Supplier	Telephone & Web Site	*Customer Class
Ambit Northeast, LLC 103 Carnegie Center Suite 300 Princeton, NJ 08540	(877)-30-AMBIT (877) 302-6248 www.ambitenergy.com	**R/C** **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/I** **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. 1085 Morris Avenue, Suite 150 Union, NJ 07083	866-867-8328 908-638-6605 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 900A Lake Street, Suite 2 Ramsey, NJ 07466	(800) 900-1982 www.constellation.com	**C/I** **ACTIVE**
Direct Energy Business, LLC 120 Wood Avenue, Suite 611 Iselin, NJ 08830	888-925-9115 www.directenergy.com	**C/I** **ACTIVE**
Direct Energy Services, LLP 120 Wood Avenue, Suite 611 Iselin, NJ 08830	866-348-4193 www.directenergy.com	**R** **ACTIVE**
Gateway Energy Services Corp. 44 Whispering Pines Lane Lakewood, NJ 08701	800-805-8586 www.gesc.com	**R/C/I** **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**
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**
Hess Energy, Inc. One Hess Plaza Woodbridge, NJ 07095	800-437-7872 www.hess.com	**C/I** **ACTIVE**
Hess Small Business Services, LLC One Hess Plaza Woodbridge, NJ 07095	888-494-4377 www.hessenergy.com	**C/I** **ACTIVE**
HIKO Energy, LLC 655 Suffern Road Teaneck, NJ 07666	(888) 264-4908 www.hikoenergy.com	**R/C** **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**
Integrys Energy Services – Natural Gas, LLC 99 Wood Avenue South Suite #802 Iselin, NJ 08830	800-536-0151 www.integrysenergy.com	**C/I** **ACTIVE**
Intelligent Energy 2050 Center Avenue, Suite 500 Fort Lee, NJ 07024	800-927-9794 www.intelligentenergy.org	**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/C/I** **ACTIVE**
Major Energy Services, LLC 10 Regency CT Lakewood, NJ 08701	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	800-828-9427 www.metromediaenergy.com	**C** **ACTIVE**
Metro Energy Group, LLC 14 Washington Place Hackensack, NJ 07601	888-53-Metro www.metroenergy.com	**R/C** **ACTIVE**
MxEnergy, Inc. 900 Lake Street Ramsey, NJ 07446	800-758-4374 www.mxenergy.com	**R/C/I** **ACTIVE**
NATGASCO (Mitchell Supreme) 532 Freeman Street Orange, NJ 07050	800-840-4GAS www.natgasco.com	**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 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 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. 3000 East Brunswick, NJ 08816	(888) 313-9086 www.napower.com	**R/C/I** **ACTIVE**
Palmco Energy NJ, LLC One Greentree Centre 10,000 Lincoln Drive East, Suite 201 Marlton, NJ 08053	877-726-5862 www.PalmcoEnergy.com	**R/C/I** **ACTIVE**
Pepco Energy Services, Inc. 112 Main Street Lebanon, NJ 08833	800-363-7499 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 EnergyPlus, LLC 811 Church Road - Office 105 Cherry Hill, NJ 08002	800-281-2000 www.pplenergyplus.com	**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**
S.J. Energy Partners, Inc. 208 White Horse Pike, Suite 4 Barrington, NJ 08007	800-695-0666 www.sjnaturalgas.com	**R/C** **ACTIVE**
Spark Energy Gas, L.P. 2105 CityWest Blvd, Ste 100 Houston, Texas 77042	800-411-7514 www.sparkenergy.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	(973) 494-8097 www.streamenergy.net	**R/C** **ACTIVE**
Systrum Energy 1 Bergen Blvd. Fairview, NJ 07022	877-797-8786 www.systrumenergy.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 Newark, NJ 07102	888-997-8979 www.xoomenergy.com	**R/C/I** **ACTIVE**
Your Energy Holdings, LLC One International Boulevard Suite 400 Mahwah, NJ 07495-0400	(855) 732-2493 www.thisisyourenergy.com	**R/C/I** **ACTIVE**

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APPENDIX B

Equipment Inventory

CHA Project # 28661
Rec Center
William Paterson University

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.
RTU	2	McQuay	RAH077CLA	38J00239 02	RTU with DX Cooling and Gas Furnance	2500 MBH input Heating Capacity and ~75 ton Coolin Capacity	Estimated EER of 10	Roof	Gymnasium	2002	8	
RTU	1	McQuay	ALP205CY12	58J8134701	RTU with DX Cooling and Gas Furnance	~30 ton	Estimated EER of 10	Roof	Weight Room and Multipurpose Room	2000	6	
RTU	1	Trane	YCD600AEHD2A2K01AHJ	J98J92563	RTU with DX Cooling and Gas Furnance	~ 20 ton and ~130 MBH	Estimated EER of 10	Roof	Common Areas and Locker Rooms	2000	6	
RTU	1	Daikin	RPS020SAS5A	N/A	RTU with DX Cooling and Gas Furnance	~ 20 ton	Estimated EER of 10	Roof	Racquet Ball Room	2014	20	
PTHP	4	Carrier	N/A	N/A	PTHP	~1 ton Coolig Capacity and 12 MBH Heating	N/A	Office	Offices	1992	-2	
DHW Heater	1	unknown	unknown	unknown	DHW gas fired heater	unknown	unknown	possible locker room	Building	2002	8	

Energy Audit of Rec Center
CHA Project No.28661
Existing Lighting & Audit Input

Cost of Electricity: **$0.160** **$/kWh**
$11.93 **$/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
250	Gymnasium	Gymnasium	72	T 54 W F 3 (ELE) (T-5)	F44GHL	234	16.85	SW	3360	56,609	NONE	
15LED	Storage Room 102	Storage Areas	12	S 32 C F 2 (ELE)	F42LL	60	0.72	SW	3360	2,419	C-OCC	
20LED	Men's Room	Restroom	4	S 28 P F 1 (ELE)	F41ILL	31	0.12	SW	3360	417	NONE	
32LED	Men's Room	Restroom	6	1T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3360	1,210	NONE	
32LED	Women's Room	Restroom	3	1T 32 R F 2 (ELE)	F42LL	60	0.18	SW	3360	605	NONE	
32LED	Corridor	Hallways	30	1T 32 R F 2 (ELE)	F42LL	60	1.80	SW	3360	6,048	NONE	
15LED	Men's Locker Room	Locker	10	S 32 C F 2 (ELE)	F42LL	60	0.60	SW	3360	2,016	NONE	
25	Men's Locker Room	Locker	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.08	SW	3360	282	NONE	
15LED	Women's Locker Room	Locker	10	S 32 C F 2 (ELE)	F42LL	60	0.60	SW	3360	2,016	NONE	Estimated
25	Women's Locker Room	Locker	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.08	SW	3360	282	NONE	Estimated
35LED	Weight Room 145	Gymnasium	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.35	SW	3360	4,536	NONE	
35LED	Multipurpose Room 144	Gymnasium	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.44	SW	3360	4,838	NONE	
500	Racqueball Court 146	Gymnasium	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	0.96	SW	3360	3,226	NONE	4lamp tight U shape
500	Racqueball Court 147	Gymnasium	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	0.96	SW	3360	3,226	NONE	4lamp tight U shape
500	Racqueball Court 148	Gymnasium	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	0.96	SW	3360	3,226	NONE	4lamp tight U shape
500	Racqueball Court 149	Gymnasium	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	0.96	SW	3360	3,226	NONE	4lamp tight U shape
32LED	Corridor 150	Hallways	6	1T 32 R F 2 (ELE)	F42LL	60	0.36	SW	3360	1,210	NONE	
5LED	Office 138/138A	Offices	8	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.48	SW	3360	1,613	NONE	
5LED	Office 135	Offices	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	3360	806	C-OCC	
5LED	Office 136	Offices	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	3360	806	C-OCC	
5LED	Office 137	Offices	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	3360	806	C-OCC	
5LED	Office 138	Offices	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	3360	806	C-OCC	
5LED	Office 139	Offices	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.24	SW	3360	806	C-OCC	
15LED	Storage Room 141	Storage Areas	5	S 32 C F 2 (ELE)	F42LL	60	0.30	SW	3360	1,008	C-OCC	
231LED	Outdoor	Outdoor Lighting	10	WP400MH1	MH400/1	458	4.58	Breaker	4368	20,005	NONE	
	Total		**265**				**34.95**			**122,049**		

APPENDIX C

ECM Calculations

William Paterson University - Rec Center
CHA Project Numer: 28661

Rate of Discount (used for NPV) 3.0%

Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
$ 0.181	$/kWh blended		0.000420205	44,000	Electric	Natural Gas	Fuel Oil
$ 0.160	$/kWh supply	1,066,364	0.000420205		$ 193,092	$ 46,111	
$ 11.93	$/kW	160.0	0				
$ 1.02	$/Therm	45,311	0.00533471				
Estimated $ 7.50	$/kgals		0				
	$/Gal						

Rec Center

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
Y	ECM-1	Utilize Economizer Mode on the RTUs	0.0	18,553	1,226	0	0	4,606	$ 78,200	17.0	15	14.3		N	17.0	0.0	278,302	18,393	0	$ 69,097	(0.1)	($23,209)	-1.5%
Y	ECM-2	Install Demand Control Ventilation on the RTUs	0.0	4,034	496	0	0	1,235	$ 39,400	31.9	15	4.3		N	31.9	0.0	60,517	7,437	0	$ 18,525	(0.5)	($24,657)	-8.2%
Y	ECM-3	Install Programmable Thermostats for all the RTUs to Reset Temperature	0.0	6,765	10	0	0	1,234	$ 10,818	8.8	15	2.9		N	8.8	0.0	101,482	146	0	$ 18,517	0.7	$3,920	7.6%
Y	ECM-4	Install Vending Misers	0.0	9,324	0	0	0	1,688	$ 1,120	0.7	18	3.9		N	0.7	0.0	167,832	0	0	$ 30,378	26.1	$22,091	150.6%
Y	ECM-5	Replace High Flow Plumbing Fixtures with Low Flow Plumbing Fixtures	0.0	0	37	0	95	752	$ 109,389	145.5	20	0.2		N	145.5	0.0	0	745	1,904	$ 15,039	(0.9)	($98,202)	-14.3%
N	ECM-L1	Lighting Replacements / Upgrades	8.8	33,220	0	0	0	6,573	$ 42,980	6.5	15	14.0	$ 5,410	N	5.7	131.8	498,300	0	0	$ 109,059	1.5	$40,898	15.5%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	1,492	0	0	0	239	$ 1,890	7.9	15	0.6	$ 245	N	6.9	0.0	22,380	0	0	$ 4,051	1.1	$1,205	11.8%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	8.8	33,899	0	0	0	6,682	$ 44,870	6.7	15	14.2	$ 5,655	N	5.9	131.8	508,485	0	0	$ 110,903	1.5	$40,550	14.9%
		Total (Does Not Include ECM-L1 & ECM-L2)	**8.8**	**72,576**	**1,769**	**0**	**95**	**$ 16,197**	**$ 283,797**	**17.5**	**16.3**	**40**	**$ 5,655**		**17.17**	**132**	**1,116,618**	**26,722**	**1,904**	**$ 262,458**	**(0.1)**	**-74687.939**	**-0.8%**
		Recommended Measures (highlighted green above)	**8.8**	**72,576**	**1,769**	**0**	**95**	**$ 16,197**	**$ 283,797**	**17.5**	**16.3**	**40**	**$ 5,655**	**0**	**17.17**	**132**	**1,116,618**	**26,722**	**1,904**	**$ 262,458**	**(0.1)**	**-74687.939**	**-0.8%**
		% of Existing	**5%**	**7%**	**4%**	**0**	**0**																

City:	Newark, NJ					
Occupied Hours/Week	48					

Temp	Enthalpy h (Btu/lb)	Bin Hours	Building Operating Hours	Auditorium Occupied Hours	Gymnasium Occupied Hours	Library Occupied Hours	Classrooms Occupied Hours
102.5							
97.5	35.4	6	2	0	0	0	0
92.5	37.4	31	9	0	0	0	0
87.5	35.0	131	37	0	0	0	0
82.5	33.0	500	143	0	0	0	0
77.5	31.5	620	177	0	0	0	0
72.5	29.9	664	190	0	0	0	0
67.5	27.2	854	244	0	0	0	0
62.5	24.0	927	265	0	0	0	0
57.5	20.3	600	171	0	0	0	0
52.5	18.2	730	209	0	0	0	0
47.5	16.0	491	140	0	0	0	0
42.5	14.5	656	187	0	0	0	0
37.5	12.5	1,023	292	0	0	0	0
32.5	10.5	734	210	0	0	0	0
27.5	8.7	334	95	0	0	0	0
22.5	7.0	252	72	0	0	0	0
17.5	5.4	125	36	0	0	0	0
12.5	3.7	47	13	0	0	0	0
7.5	2.1	34	10	0	0	0	0
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

William Paterson University - Rec Center
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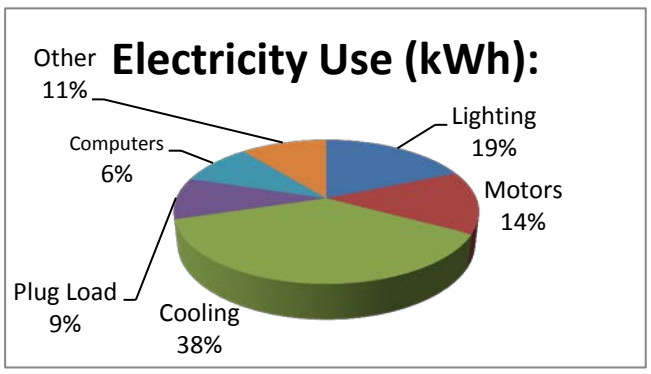
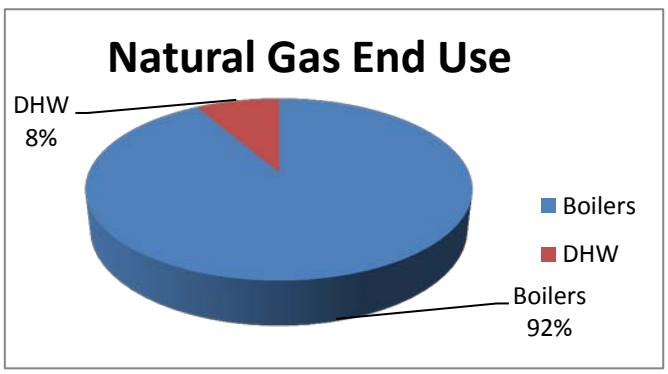
Rec Center

Utility End Use Analysis			
Electricity Use (kWh):		**Notes/Comments:**	
1,066,364	Total	Based on utility analysis	
200,000	Lighting	From Lighting Calculations	19%
150,000	Motors	Estimated	14%
400,000	Cooling	Estimated	38%
100,000	Plug Load	Estimated	9%
100,000	Computers	Estimated	9%
116,364	Other	Remaining	11%
Natural Gas Use (Therms):		**Notes/Comments:**	
45,311	Total	Based on utility analysis	
41,511	Boilers	Therms/SF x Square Feet Served	92%
3,800	DHW	Based on utility analysis	8%





William Paterson University - Rec Center
CHA Project Numer: 28661
Rec Center

ECM-1 Utilize Economizer Mode on the RTUs

Description: This ECM evaluates the energy savings associated with implementing a control system that monitor the outdoor air temperature and humidity to introduce as much outdoor air as possible when the outdoor air condition is favorable for heating or air conditioning.

Building Information:

44,000	Sq Footage	$0.18	$/kWh Blended
Y	Cooling	$1.02	$/Therm
Y	Heating		

Economizer Savings

EXISTING CONDITIONS		
Existing Facility Total Electric Usage	1,066,364	kWh
Existing Facility Total Gas Usage	45,311	Therms
Existing Facility Cooling Electric usage	400,000.0	kWh[1]
Existing Facility Heating Natural Gas usage	41,511	Therms[2]
PROPOSED CONDITIONS		
Proposed Facility Cooling Electric Savings	18,553	kWh
Proposed Facility Natural Gas Savings	1,226	Therms
SAVINGS		
Electric Savings	18,553	**kWh**
Natural Gas Savings	1,226	**Therms**

Temp	Enthalpy h (Btu/lb)	Bin Hours	Building Operating Hours	Building Not Operating Hours	Free Cooling Hours	Free Heating Hours
102.5						
97.5	35.4	6	3.0	3.0	0.0	0.0
92.5	37.4	31	15.5	15.5	0.0	0.0
87.5	35.0	131	65.5	65.5	0.0	0.0
82.5	33.0	500	250.0	250.0	0.0	0.0
77.5	31.5	620	310.0	310.0	0.0	0.0
72.5	29.9	664	332.0	332.0	66.4	0.0
67.5	27.2	854	427.0	427.0	106.8	0.0
62.5	24.0	927	463.5	463.5	0.0	115.9
57.5	20.3	600	300.0	300.0	0.0	60.0
52.5	18.2	730	365.0	365.0	0.0	0.0
47.5	16.0	491	245.5	245.5	0.0	0.0
42.5	14.5	656	328.0	328.0	0.0	0.0
37.5	12.5	1,023	511.5	511.5	0.0	0.0
32.5	10.5	734	367.0	367.0	0.0	0.0
27.5	8.7	334	167.0	167.0	0.0	0.0
22.5	7.0	252	126.0	126.0	0.0	0.0
17.5	5.4	125	62.5	62.5	0.0	0.0
12.5	3.7	47	23.5	23.5	0.0	0.0
7.5	2.1	34	17.0	17.0	0.0	0.0
2.5	1.3	1	0.5	0.5	0.0	0.0
-2.5					173.2	175.9

Assumptions

1 38% of facility total electricity dedicated to Cooling; based on utility information
2 92% of facility total natural gas dedicated to Heating; based on utility information
3 Cooling Hours 3,733 hr/yr % of Clg Reduction 5%
4 Heating Hours 5,954 hr/yr % of Htg Reduction 3%

COMBINED SAVINGS		
Natural Gas Savings	1,226	Therms
Cooling Electricity Savings	18,553	kWh
Total Cost Savings	$ 4,606	
Estimated Total Project Cost	$ 78,200	
Simple Payback	17.0	Yrs

William Paterson University - Rec Center
CHA Project Numer: 28661
Rec Center

ECM-1 Utilize Economizer Mode on the RTUs - 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.		
						$ -	$ -	$ -	$ -	
Damper/Actuator	5	EA	$ 5,000	$ 2,500		$ 25,675	$ 15,575	$ -	$ 41,250	Estimated
Control Upgrade	5	EA	$ 1,000	$ 2,000		$ 5,135	$ 12,460	$ -	$ 17,595	Estimated
Outddor Air Temp Sensor	1	EA	$ 100	$ 100		$ 103	$ 125	$ -	$ 227	RS Means
Wiring and Misc	1	EA	$ 1,000	$ 2,000		$ 1,027	$ 2,492	$ -	$ 3,519	Estimated

$ 62,591	Subtotal
$ 15,648	25% Contingency
$ 78,200	**Total**

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

William Paterson University - Rec Center
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Rec Center

ECM-2 Install Demand Control Ventilation on the RTUs

AIR HANDLER	AREA SERVED	CFM	OA CFM	% OA
McQuay RTU	Gymnasium	5,000	1,500	30% <<Estimated
McQuay RTU	Gymnasium	5,000	1,500	30% <<Estimated
McQuay RTU	Weight Room/Multipurpose Room	2,000	600	30% <<Estimated
Trane RTU	Common Areas	2,000	600	30% <<Estimated
Daikin RTU	Racquet Ball Room	2,000	600	30% <<Estimated
			4,800	*CFM*

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	$	0.18	/kWh
Natural Gas Cost	$	1.02	/therm
Facility Ventilation Heating Load		181,440	BTU/Hour[1,2,3]
Facility Ventilation Cooling Load		51,840	BTU/Hour[1,2,3]
Existing Ventilation Heating Usage		9,916	Therms[2]
Existing Ventilation Cooling Usage		80,690	kWh[3]
Proposed Ventilation Heating Usage		9,421	Therms[7]
Proposed Ventilation Cooling Usage		76,655	kWh[7]
Total heating savings		496	**Therms**
Total cooling savings		4,034	**kWh**
Total cost savings		$ 1,235	
Estimated Total Project Cost		$39,400	[8]
Simple Payback		31.9	**years**

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

Assumptions

1	4,800	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	81%	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	$ 39,400	estimated measure cost for installation of sensors and associated controls

William Paterson University - Rec Center
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Rec Center

ECM-2 Install Demand Control Ventilation on the RTUs - 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.		
						$ -	$ -	$ -	$ -	
DCV Controls	5	EA	$ 2,000	$ 2,000		$ 10,270	$ 12,460	$ -	$ 22,730	Estimated
CO2 Sensor4	5	EA	$ 500	$ 1,000		$ 2,568	$ 6,230	$ -	$ 8,798	RS Means 2012
						$ -	$ -	$ -	$ -	

$ 31,528	Subtotal
$ 7,882	25% Contingency
$ 39,400	**Total**

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

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ECM-3 Install Programmable Thermostats for all the RTUs to Reset Temperature

Description: This ECM evaluates adding programmable thermostats that will reset temperature during unoccupied hours.

Day Setback

EXISTING CONDITIONS			
Heating			
Heating Season Facility Temp	72	F	Th
Weekly Occupied Hours	84	hrs	H
Heating Season Setback Temp	72	F	Sh
Heating Season % Savings per	1%		Ph
Annual Heating Capacity	41,511	Mbtu/yr	
Connected Heating Load	41,511	Btu/hr	Caph
Equivalent Full Load Heating	900	hrs	EFLHh
Heating Equipment Efficiency	80%		AFUEh
Cooling			
Cooling Season Facility Temp	70	F	Tc
Weekly Occupied Hours	84	hrs	H
Cooling Season Setback Temp	70	F	Sc
Cooling Season % Savings per	3%		Pc
Connected Cooling Load	220	Tons	Capc
Equivalent Full Load Cooling	381	hrs	EFLHc
Cooling Equipment EER	12.0		AFUEc
SAVINGS			
Natural Gas Savings	0	Therms[3]	
Cooling Electricity Savings	0	kWh	

Nighttime Setback

EXISTING CONDITIONS		
Heating		
Heating Season Facility Temp	72	F
Weekly Occupied Hours	84	hrs
Heating Season Setback Temp	64	F
Heating Season % Savings per	1%	
Annual Heating Capacity	41,511	Mbtu/yr
Connected Heating Load Capacity	41,511	Btu/hr
Equivalent Full Load Heating Hours	500	hrs
Heating Equipment Efficiency	80%	
Cooling		
Cooling Season Facility Temp	70	F
Weekly Occupied Hours	84	hrs
Cooling Season Setback Temp	76	F
Cooling Season % Savings per	6%	
Connected Cooling Load Capacity	220	Tons
Equivalent Full Load Cooling Hours	381	hrs
Cooling Equipment EER	12.0	
SAVINGS		
Natural Gas Savings	10	Therms[3]
Cooling Electricity Savings	6,765	kWh

$0.18 $/kWh Blended
$1.02 $/Therm

COMBINED SAVINGS		
Natural Gas Savings	10	Therms
Cooling Electricity Savings	6,765	kWh
Total Cost Savings	$ 1,234	
Estimated Total Project Cost	$ 10,818	
Simple Payback	8.8	Yrs

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

Algorithms

Cooling Energy Savings (kWh) = (((Tc*(H+5)+Sc*(168-(H+5)))/168) Tc)*(Pc*Caphp*12*EFLHc/EERhp)

Heating Energy Savings (kWh) = (((Th*(H+5)+Sh*(168-(H+5)))/168)-Th)*(Ph*Caphp*12*EFLHh/EERhp)

Heating Energy Savings (Therms) = (Th-(Th*(H+5)+Sh*(168-(H+5)))/168)*(Ph*Caph*EFLHh/AFUEh/100,000)

Definition of Variables

T_h = Heating Season Facility Temp. (°F)
T_c = Cooling Season Facility Temp. (°F)
S_h = Heating Season Setback Temp. (°F)
S_c = Cooling Season Setup Temp. (°F)
H = Weekly Occupied Hours
Cap_{hp} = Connected load capacity of heat pump/AC (Tons) – Provided on Application.
Cap_h = Connected heating load capacity (Btu/hr) – Provided on Application.
$EFLH_c$ = Equivalent full load cooling hours
$EFLH_h$ = Equivalent full load heating hours
P_h = Heating season percent savings per degree setback
P_c = Cooling season percent savings per degree setup
$AFUE_h$ = Heating equipment efficiency – Provided on Application.
EER_{hp} = Heat pump/AC equipment efficiency – Provided on Application

Occupancy Controlled Thermostats

Component	Type	Value	Source
T_h	Variable		Application
T_c	Variable		Application
S_h	Fixed	T_h-5°	
S_c	Fixed	T_c+5°	
H	Variable		Application; Default of 56 hrs/week
Cap_{hp}	Variable		Application
Cap_h	Variable		Application
$EFLH_c$	Fixed	381	1
$EFLH_h$	Fixed	900	PSE&G
P_h	Fixed	3%	2
P_c	Fixed	6%	2
$AFUE_h$	Variable		Application
EER_{hp}	Variable		Application

Sources:
1. JCP&L metered data from 1995-1999
2. ENERGY STAR Products website

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Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-3 Install Programmable Thermostats for all the RTUs to Reset Temperature - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
Programmable Controller	4	ea	$ 1,500	$ 500		$ 6,162	$ 2,492	$ -	$ 8,654	RS Means 2012
						$ -	$ -	$ -	$ -	

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

$ 8,654	Subtotal
$ 2,164	25% Contingency
$ 10,818	**Total**

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ECM-4 Install Vending Misers

Description : Vending machines generally operate 24/7 regardless of the actual usage. This measure proposes installing vending machine controls to reduce the total run time of these units. Cold beverage machines will cycle on for 15 minutes every two hours in order to keep beverages at a desired temperature. The result is a reduction in total electrical energy usage.

Unit Cost: $0.181 $/kWh blended

Energy Savings Calculations:

	Existing	
Cold Beverage Vending Machine Electric usage	7,008	kWh[1,4,7]
Snack Vending Machine Electric usage	3,504	kWh[2,5,7]
Dual Vending Machine Electric Usage	-	kWh[3,6,7]
Total Vending Machine Electric Usage	10,512	kWh

	Proposed	
Cold Beverage Vending Machine Electric usage	756	kWh[8]
Snack Vending Machine Electric usage	432	kWh
Dual Vending Machine Electric Usage	0	kWh
Total Vending Machine Electric Usage	1,188	kWh

Vending Machine Controls Usage Savings	**9,324**	**kWh**
Total cost savings	**$ 1,688**	
Estimated Total Project Cost	**$ 1,120**	[9]
Simple Payback	**1**	**years**

Assumptions

1	2	Number of cold beverage vending machines
2	2	Number of snack vending machines
3	0	Number of dual snack/beverage vending machines
4	400	Average wattage, typical of cold beverage machines based on prior project experience
5	200	Average wattage, typical of snack machines based on prior project experience
6	300	Average wattage, typical of dual snack/beverage machines based on prior project experience
7	8760	Hours per year vending machine plugged in
8	2160	Building Occupied Hours
9	0.50	Vending Machine Traffic Factor (0.75 for High Traffic, 0.5 for Medium, 0.25 for low)

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ECM-4 Install Vending Misers - 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.		
									$ -	
Vending Miser	4	EA	$ 200	$ 15	$ -	$ 822	$ 75	$ -	$ 896	Vendor Estimation
						$ -	$ -	$ -	$ -	

$ 896	Subtotal
$ 224	25% Contingency
$ 1,120	**Total**

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

William Paterson University - Rec Center
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ECM: Replace urinals and flush valves with low flow

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

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$7.50	$ / kGal
Urinals in Building to be replaced	7	
Average Flushes / Urinal (per Day)	20	
Average Gallons / Flush	1.5	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	7	
Proposed Gallons / Flush	0.125	Gal
Proposed Material Cost of new urinal & valve	$1,200	RS Means 2012
Proposed Installation Cost of new urinal & valve	$1,000	RS Means 2012
Total cost of new urinals & valves		

SAVINGS		
Current Urinal Water Use	76.65	kGal / year
Proposed Urinal Water Use	6.39	kGal / year
Water Savings	70.26	kGal / year
Cost Savings	$527	/ year

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

William Paterson University - Rec Center
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Rec Center

ECM: Replace toilets and flush valves with low flow

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

EXISTING CONDITIONS		
Cost of Water / 1000 Gallons	$7.50	$ / kGal
Toilets in Building	18	
Average Flushes / Toilet (per Day)	1	
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	18	
Proposed Gallons / Flush	1.28	Gal

SAVINGS		
Current Toilet Water Use	23.00	kGal / year
Proposed Toilet Water Use	8.41	kGal / year
Water Savings	14.59	kGal / year
Cost Savings	$109	/ year

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ECM: 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	$7.50	$ / kGal
Faucets in Building	14	
Average Uses / Faucet (per day)	2	# Uses
Average Time of Use	30	seconds
Average Flowrate	2.0	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	14	
Proposed Flowrate	0.5	gpm

HEATING SAVINGS		
Fuel Cost	$ 1.02	/therm
Number of Faucets	14	
Hours per Day of Usage	0.017	hrs
Days per Year of Facility Usage	238	days
Average Flowrate	2.0	gpm
Proposed Flowrate	0.5	gpm
Heat Content of Water	8.33	Btu/gal/F
Temperature Difference (Intake and Output)	35	F
Water Heating Equipment Efficiency	81%	
SAVINGS		
Current Faucet Water Use	6.66	kGal / year
Proposed Faucet Water Use	1.67	kGal / year
Water Savings	5.00	kGal / year
Heating Savings	18	therms
Cost Savings	$56	/ 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

William Paterson University - Rec Center
CHA Project Numer: 28661
Rec Center

ECM: 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	$7.50	$ / kGal
Faucets in Building	6	
Average Uses / Faucet (per day)	1	# Uses
Average Time of Use	300	seconds
Average Flowrate	3.0	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	6	
Proposed Flowrate	1.5	gpm

HEATING SAVINGS		
Fuel Cost	$ 1.02	/therm
Number of Faucets	6	
Hours per Day of Usage	0.042	hrs
Days per Year of Facility Usage	238	days
Average Flowrate	3.0	gpm
Proposed Flowrate	1.5	gpm
Heat Content of Water	8.33	Btu/gal/F
Temperature Difference (Intake and Output)	35	F
Water Heating Equipment Efficiency	81%	
SAVINGS		
Current Faucet Water Use	10.71	kGal / year
Proposed Faucet Water Use	5.36	kGal / year
Water Savings	5.36	kGal / year
Heating Savings	19	therms
Cost Savings	$60	/ 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

William Paterson University - Rec Center
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Rec Center

#REF!

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									$ -	
Low-Flow Urinal	7	EA	$ 1,200	$ 1,000	$ -	$ 8,627	$ 8,722	$ -	$ 17,349	Vendor Estimate
Low-Flow Toilet	18	EA	$ 1,400	$ 1,000	$ -	$ 25,880	$ 22,428	$ -	$ 48,308	Vendor Estimate
Low-Flow Faucet	14	EA	$ 700	$ 300	$ -	$ 10,065	$ 5,233	$ -	$ 15,298	Vendor Estimate
Low-Flow Shower	6	EA	$ 700	$ 300	$ -	$ 4,313	$ 2,243	$ -	$ 6,556	Vendor Estimate

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

$ 87,511	Subtotal
$ 21,878	25% Contingency
$ 109,389	**Total**

William Paterson University - Rec Center
CHA Project Numer: 28661
Rec Center

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)	44,000
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)	$193,092	$46,111
Existing Usage (from utility)	1,066,364	45,311
Proposed Savings	72,576	1,769
Existing Total MMBtus	8,171	
Proposed Savings MMBtus	425	
% Energy Reduction	**5.2%**	
Proposed Annual Savings	$16,197	

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

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

Total Project Cost	$283,797

		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	$283,797	

Project Payback (years)	
w/o Incentives	w/ Incentives
17.5	17.5

* 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 Rec Center
CHA Project No.28661
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
250	Gymnasium	72	T 54 W F 3 (ELE) (T-5)	F44GHL	234	16.8	SW	3360	56,609	72	T 54 W F 3 (ELE) (T-5)	F44GHL	234	16.8	SW	3,360	56,609	-	0.0	$ -	$ -	$0		#DIV/0!
15LED	Storage Room 102	12	S 32 C F 2 (ELE)	F42LL	60	0.7	SW	3360	2,419	12	4 ft LED Tube	200732x2	30	0.4	SW	3,360	1,210	1,210	0.4	$ 245.07	$ 2,804.40	$420	11.4	9.7
20LED	Men's Room	4	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	3360	417	4	4 ft LED Tube	200732x1	15	0.1	SW	3,360	202	215	0.1	$ 43.57	$ 580.80	$140	13.3	10.1
32LED	Men's Room	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,210	6	4 ft LED Tube	200732x2	30	0.2	SW	3,360	605	605	0.2	$ 122.54	$ 1,402.20	$210	11.4	9.7
32LED	Women's Room	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3360	605	3	4 ft LED Tube	200732x2	30	0.1	SW	3,360	302	302	0.1	$ 61.27	$ 701.10	$105	11.4	9.7
32LED	Corridor	30	1T 32 R F 2 (ELE)	F42LL	60	1.8	SW	3360	6,048	30	4 ft LED Tube	200732x2	30	0.9	SW	3,360	3,024	3,024	0.9	$ 612.68	$ 7,011.00	$1,050	11.4	9.7
15LED	Men's Locker Room	10	S 32 C F 2 (ELE)	F42LL	60	0.6	SW	3360	2,016	10	4 ft LED Tube	200732x2	30	0.3	SW	3,360	1,008	1,008	0.3	$ 204.23	$ 2,337.00	$350	11.4	9.7
25	Men's Locker Room	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3360	282	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3,360	282	-	0.0	$ -	$ -	$0		#DIV/0!
15LED	Women's Locker Room	10	S 32 C F 2 (ELE)	F42LL	60	0.6	SW	3360	2,016	10	4 ft LED Tube	200732x2	30	0.3	SW	3,360	1,008	1,008	0.3	$ 204.23	$ 2,337.00	$350	11.4	9.7
25	Women's Locker Room	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3360	282	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3,360	282	-	0.0	$ -	$ -	$0		#DIV/0!
35LED	Weight Room 145	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	3360	4,536	15	T 59 R LED	RTLED38	38	0.6	SW	3,360	1,915	2,621	0.8	$ 530.99	$ 3,543.75	$0	6.7	6.7
35LED	Multipurpose Room 144	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	3360	4,838	16	T 59 R LED	RTLED38	38	0.6	SW	3,360	2,043	2,796	0.8	$ 566.39	$ 3,780.00	$0	6.7	6.7
500	Racquetball Court 146	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,226	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3,360	3,226	-	0.0	$ -	$ -	$0		#DIV/0!
500	Racquetball Court 147	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,226	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3,360	3,226	-	0.0	$ -	$ -	$0		#DIV/0!
500	Racquetball Court 148	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,226	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3,360	3,226	-	0.0	$ -	$ -	$0		#DIV/0!
500	Racquetball Court 149	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,226	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3,360	3,226	-	0.0	$ -	$ -	$0		#DIV/0!
32LED	Corridor 150	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,210	6	4 ft LED Tube	200732x2	30	0.2	SW	3,360	605	605	0.2	$ 122.54	$ 1,402.20	$210	11.4	9.7
5LED	Office 138/138A	8	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.5	SW	3360	1,613	8	2T XX R LED	2RTLED	25	0.2	SW	3,360	672	941	0.3	$ 190.61	$ 1,620.00	$400	8.5	6.4
5LED	Office 135	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	SW	3,360	336	470	0.1	$ 95.31	$ 810.00	$200	8.5	6.4
5LED	Office 136	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	SW	3,360	336	470	0.1	$ 95.31	$ 810.00	$200	8.5	6.4
5LED	Office 137	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	SW	3,360	336	470	0.1	$ 95.31	$ 810.00	$200	8.5	6.4
5LED	Office 138	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	SW	3,360	336	470	0.1	$ 95.31	$ 810.00	$200	8.5	6.4
5LED	Office 139	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	SW	3,360	336	470	0.1	$ 95.31	$ 810.00	$200	8.5	6.4
15LED	Storage Room 141	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	3360	1,008	5	4 ft LED Tube	200732x2	30	0.2	SW	3,360	504	504	0.2	$ 102.11	$ 1,168.50	$175	11.4	9.7
231LED	Outdoor	10	WP400MH1	MH400/1	458	4.6	Breaker	4368	20,005	10	WPLED2T78	WPLED2T78	91	0.9	Breaker	4,368	3,975	16,031	3.7	$ 3,090.29	$ 10,241.91	$1,000	3.3	3.0
	Total	**265**				**35.0**			**122,049**	**265**			**1,342**	**26.2**			**88,828**	**33,220**	**8.8**	**$6,573**	**$42,980**	**$5,410**		
																		Demand Savings		**8.8**	**$1,258**			
																		kWh Savings		**33,220**	**$5,315**			
																		Total savings			**$6,573**		**6.5**	**5.7**

Energy Audit of Rec Center
CHA Project No.28861
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)	($/kWh) * (kW Saved)	Cost for renovations to lighting system		Length of time for renovations cost to be recovered	Length of time for renovations cost to be recovered
250	Gymnasium	72	T 54 W F 3 (ELE) (T-5)	F44GHL	234	16.8	SW	3360	56,609.3	72	T 54 W F 3 (ELE) (T-5)	F44GHL	234	16.8	NONE	3360	56,609.3	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
15LED	Storage Room 102	12	S 32 C F 2 (ELE)	F42LL	60	0.7	SW	3360	2,419.2	12	S 32 C F 2 (ELE)	F42LL	60	0.7	C-OCC	2688	1,935.4	483.8	0.0	$77.41	$270.00	$35.00	3.5	3.0
20LED	Men's Room	4	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	3360	416.6	4	S 28 P F 1 (ELE)	F41ILL	31	0.1	NONE	3360	416.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	Men's Room	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,209.6	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	NONE	3360	1,209.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	Women's Room	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3360	604.8	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	NONE	3360	604.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	Corridor	30	1T 32 R F 2 (ELE)	F42LL	60	1.8	SW	3360	6,048.0	30	1T 32 R F 2 (ELE)	F42LL	60	1.8	NONE	3360	6,048.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
15LED	Men's Locker Room	10	S 32 C F 2 (ELE)	F42LL	60	0.6	SW	3360	2,016.0	10	S 32 C F 2 (ELE)	F42LL	60	0.6	NONE	3360	2,016.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
25	Men's Locker Room	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3360	282.2	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	NONE	3360	282.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
15LED	Women's Locker Room	10	S 32 C F 2 (ELE)	F42LL	60	0.6	SW	3360	2,016.0	10	S 32 C F 2 (ELE)	F42LL	60	0.6	NONE	3360	2,016.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
25	Women's Locker Room	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3360	282.2	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	NONE	3360	282.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	Weight Room 145	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	3360	4,536.0	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	NONE	3360	4,536.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
35LED	Multipurpose Room 144	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	3360	4,838.4	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	NONE	3360	4,838.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
500	Racquetball Court 146	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,225.6	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	NONE	3360	3,225.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
500	Racquetball Court 147	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,225.6	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	NONE	3360	3,225.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
500	Racquetball Court 148	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,225.6	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	NONE	3360	3,225.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
500	Racquetball Court 149	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,225.6	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	NONE	3360	3,225.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
32LED	Corridor 150	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,209.6	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	NONE	3360	1,209.6	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
5LED	Office 138/138A	8	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.5	SW	3360	1,612.8	8	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.5	NONE	3360	1,612.8	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
5LED	Office 135	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806.4	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	C-OCC	2688	645.1	161.3	0.0	$25.80	$270.00	$35.00	10.5	9.1
5LED	Office 136	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806.4	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	C-OCC	2688	645.1	161.3	0.0	$25.80	$270.00	$35.00	10.5	9.1
5LED	Office 137	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806.4	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	C-OCC	2688	645.1	161.3	0.0	$25.80	$270.00	$35.00	10.5	9.1
5LED	Office 138	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806.4	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	C-OCC	2688	645.1	161.3	0.0	$25.80	$270.00	$35.00	10.5	9.1
5LED	Office 139	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806.4	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	C-OCC	2688	645.1	161.3	0.0	$25.80	$270.00	$35.00	10.5	9.1
15LED	Storage Room 141	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	3360	1,008.0	5	S 32 C F 2 (ELE)	F42LL	60	0.3	C-OCC	2688	806.4	201.6	0.0	$32.26	$270.00	$35.00	8.4	7.3
231LED	Outdoor	10	WP400MH1	MH400/1	458	4.6	Breaker	4368	20,005.4	10	WP400MH1	MH400/1	458	4.6	NONE	4368	20,005.4	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
	Total	**265**				**35.0**			**122048.6**	**265.0**				**35.0**			**120556.8**	**1491.8**	**0.0**	**238.7**	**1890.0**	**245.0**		
																	Demand Savings			**0.0**	**$0**			
																	kWh Savings			**1,492**	**$239**			
																	Total Savings				**$239**		**7.9**	**6.9**

Energy Audit of Rec Center
CHA Project No.28661
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 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
250	Gymnasium	72	T 54 W F 3 (ELE) (T-5)	F44GHL	234	16.8	SW	3360	56,609	72	T 54 W F 3 (ELE) (T-5)	F44GHL	234	16.8	NONE	3,360	56,609	-	0.0	$ -	$ -	$ -		
15LED	Storage Room 102	12	S 32 C F 2 (ELE)	F42LL	60	0.7	SW	3360	2,419	12	4 ft LED Tube	200732x2	30	0.4	C-OCC	2,688	968	1,452	0.4	$ 283.78	$ 3,074.40	$ 455	10.8	9.2
20LED	Men's Room	4	S 28 P F 1 (ELE)	F41ILL	31	0.1	SW	3360	417	4	4 ft LED Tube	200732x1	15	0.1	NONE	3,360	202	215	0.1	$ 43.57	$ 580.80	$ 140	13.3	10.1
32LED	Men's Room	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,210	6	4 ft LED Tube	200732x2	30	0.2	NONE	3,360	605	605	0.2	$ 122.54	$ 1,402.20	$ 210	11.4	9.7
32LED	Women's Room	3	1T 32 R F 2 (ELE)	F42LL	60	0.2	SW	3360	605	3	4 ft LED Tube	200732x2	30	0.1	NONE	3,360	302	302	0.1	$ 61.27	$ 701.10	$ 105	11.4	9.7
32LED	Corridor	30	1T 32 R F 2 (ELE)	F42LL	60	1.8	SW	3360	6,048	30	4 ft LED Tube	200732x2	30	0.9	NONE	3,360	3,024	3,024	0.9	$ 612.68	$ 7,011.00	$ 1,050	11.4	9.7
15LED	Men's Locker Room	10	S 32 C F 2 (ELE)	F42LL	60	0.6	SW	3360	2,016	10	4 ft LED Tube	200732x2	30	0.3	NONE	3,360	1,008	1,008	0.3	$ 204.23	$ 2,337.00	$ 350	11.4	9.7
25	Men's Locker Room	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3360	282	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	NONE	3,360	282	-	0.0	$ -	$ -	$ -		
15LED	Women's Locker Room	10	S 32 C F 2 (ELE)	F42LL	60	0.6	SW	3360	2,016	10	4 ft LED Tube	200732x2	30	0.3	NONE	3,360	1,008	1,008	0.3	$ 204.23	$ 2,337.00	$ 350	11.4	9.7
25	Women's Locker Room	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	SW	3360	282	3	R 13 C CF 2 (ELE)	CFQ13/2-L	28	0.1	NONE	3,360	282	-	0.0	$ -	$ -	$ -		
35LED	Weight Room 145	15	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	3360	4,536	15	T 59 R LED	RTLED38	38	0.6	NONE	3,360	1,915	2,621	0.8	$ 530.99	$ 3,543.75	$ -	6.7	6.7
35LED	Multipurpose Room 144	16	T 32 R F 3 (ELE)	F43ILL/2	90	1.4	SW	3360	4,838	16	T 59 R LED	RTLED38	38	0.6	NONE	3,360	2,043	2,796	0.8	$ 566.39	$ 3,780.00	$ -	6.7	6.7
500	Racquetball Court 146	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,226	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	NONE	3,360	3,226	-	0.0	$ -	$ -	$ -		
500	Racquetball Court 147	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,226	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	NONE	3,360	3,226	-	0.0	$ -	$ -	$ -		
500	Racquetball Court 148	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,226	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	NONE	3,360	3,226	-	0.0	$ -	$ -	$ -		
500	Racquetball Court 149	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	SW	3360	3,226	8	2T 32 R F 2 (u) (ELE)	FU4LL	120	1.0	NONE	3,360	3,226	-	0.0	$ -	$ -	$ -		
32LED	Corridor 150	6	1T 32 R F 2 (ELE)	F42LL	60	0.4	SW	3360	1,210	6	4 ft LED Tube	200732x2	30	0.2	NONE	3,360	605	605	0.2	$ 122.54	$ 1,402.20	$ 210	11.4	9.7
5LED	Office 138/138A	8	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.5	SW	3360	1,613	8	2T XX R LED	2RTLED	25	0.2	NONE	3,360	672	941	0.3	$ 190.61	$ 1,620.00	$ 400	8.5	6.4
5LED	Office 135	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	C-OCC	2,688	269	538	0.1	$ 106.06	$ 1,080.00	$ 235	10.2	8.0
5LED	Office 136	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	C-OCC	2,688	269	538	0.1	$ 106.06	$ 1,080.00	$ 235	10.2	8.0
5LED	Office 137	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	C-OCC	2,688	269	538	0.1	$ 106.06	$ 1,080.00	$ 235	10.2	8.0
5LED	Office 138	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	C-OCC	2,688	269	538	0.1	$ 106.06	$ 1,080.00	$ 235	10.2	8.0
5LED	Office 139	4	2T 32 R F 2 (u) (ELE)	FU2LL	60	0.2	SW	3360	806	4	2T XX R LED	2RTLED	25	0.1	C-OCC	2,688	269	538	0.1	$ 106.06	$ 1,080.00	$ 235	10.2	8.0
15LED	Storage Room 141	5	S 32 C F 2 (ELE)	F42LL	60	0.3	SW	3360	1,008	5	4 ft LED Tube	200732x2	30	0.2	C-OCC	2,688	403	605	0.2	$ 118.24	$ 1,438.50	$ 210	12.2	10.4
231LED	Outdoor	10	WP400M/1	MH400/1	458	4.6	Breaker	4368	20,005	10	WPLED2T78	WPLED2T78	91	0.9	NONE	4,368	3,975	16,031	3.7	$ 3,090.29	$ 10,241.91	$ 1,000	3.3	3.0
S	**Total**	**265**				**35.0**			**122,049**	**265**				**26.2**			**88,150**		**8.8**	**6,682**	**44,870**	**$5,655**		
S																		**Demand Savings**		**8.8**	**$1,258**			
S																		**kWh Savings**		**33,899**	**$5,424**			
S																		**Total Savings**			**$6,682**		**6.7**	**5.9**

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

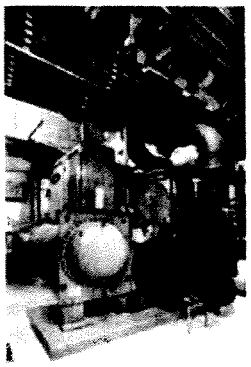
ENERGY BENCHMARKING

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

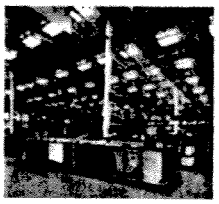
TOOLS AND RESOURCES

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.

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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

DIRECT INSTALL

ENERGY BENCHMARKING

OIL, PROPANE & MUNICIPAL ELECTRIC CUSTOMERS

EDA PROGRAMS

SBC CREDIT PROGRAM

PAST PROGRAMS

TOOLS AND RESOURCES

PROGRAM UPDATES

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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.

APPENDIX F

Photos

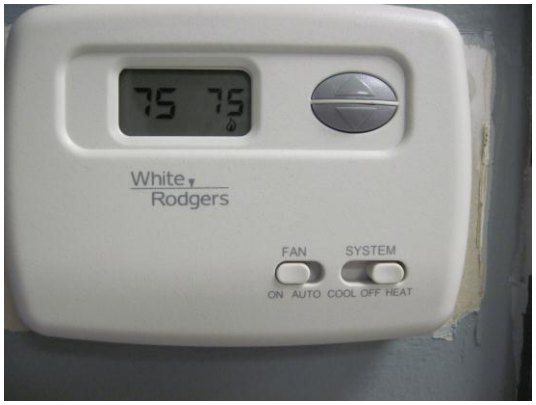
ECM-1 Utilize Economizer Mode on the RTUs

Existing Timers

ECM-2 Install Demand Control Ventilation for the RTUs

Existing RTU

ECM-3 Install Programmable Thermostats for all the RTUs to Reset Temperature



Existing controls

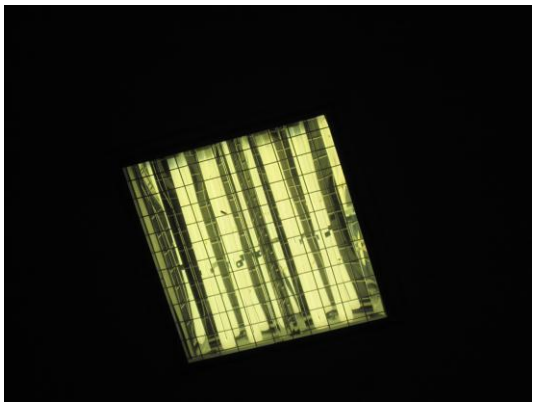
ECM-3 Install Vending Misers

Existing Vending Machines

ECM-5 Replace High Flow Plumbing Fixtures with Low Flow Plumbing Fixtures

No Pictures Available

ECM-L1 Lighting Replacement / Upgrades



Existing Lights

ECM-L2 Install Lighting Controls (Occupancy Sensors)

No Pictures Available

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

See ECM L-1 and L-2

APPENDIX G

EPA Benchmarking Report

ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

Rec Center

Primary Property Function: College/University
Gross Floor Area (ft²): 44,000
Built: 1982

For Year Ending: January 31, 2014
Date Generated: July 20, 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
Rec Center 300 Pompton Road Wayne, New Jersey 07470	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4113369

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
185.7 kBtu/ft²

Source EUI
367.8 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	4,531,123 (56%)
Electric - Grid (kBtu)	3,638,435 (44%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	132.6
National Median Source EUI (kBtu/ft²)	262.6
% Diff from National Median Source EUI	40%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	701

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)