GEORGE J. OTLOWSKI SR. CENTER FOR MENTAL HEALTH

577 Lee Street, Perth Amboy NJ 08861

LOCAL GOVERNMENT ENERGY AUDIT PROGRAM

FOR
NEW JERSEY
BOARD OF PUBLIC UTILITIES

June 2014

Prepared by:

6 Campus Drive
Parsippany, NJ 07054
(973) 538-2120

CHA PROJECT NO. 28344

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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 the George J. Otlowski Sr. Center for Mental Health, 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
George J Otlowski Sr. Center for Mental Health	577 Lee Street, Perth Amboy NJ 08861	40,000	1968,1988,2000

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 5.0.

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	Window Replacement	22,200	231	96	0	96	N
ECM-2A	Replace Existing HVAC System Option A- in kind	1,193,948	22,650	52.7	9,964	52.3	N
ECM-2B	Replace Existing HVAC System Option B VRV	1,519,028	23,367	65.0	8,640	64.6	Y
ECM-3	Replace Electric DHW Heater with a Gas Fired Condensing DHW Heater	31,341	1,295	24.2	0	24.2	Y
ECM-4	Install Low Flow Plumbing Fixtures	108,270	787	137.5	0	137.5	N
ECM-L1	Lighting Replacements / Upgrades	116,449	15,520	7.5	2,400	7.3	N
ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	41,310	2,415	17.1	5,355	14.9	N
ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	157,759	16,462	9.6	7,755	9.1	Y
Summary (Recommended)		1,708,128	41,124	41.5	16,395	41.1	

* Incentive shown is per the New Jersey SmartStart Program.

Although the combined payback for all recommended ECMs exceeds the typical 15-20 year term, Middlesex County is interested in replacing the entire HVAC system(s) as they have exceeded their useful life and annual maintenance costs continue to escalate. As such, ECM-2B is recommended as this system will meet the installation constraints imposed by the nature of the building use, provide energy efficiency improvement and a single homogenous system.

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

- Photovoltaic (PV) Rooftop Solar Power Generation – 30 kW System

2.0 BUILDING INFORMATION AND EXISTING CONDITIONS

Building Name: George J. Otlowski Sr. Center for Mental Health
Address: 577 Lee Street, Perth Amboy NJ 08861
Gross Floor Area: 40,000 Square feet
Number of Floors: 3 plus a basement
Year Built: 1968, 1988 and 2000

Description of Spaces: Offices, waiting rooms, cafeteria, auditorium, group study rooms, storage rooms, toilet rooms and mechanical rooms.
Description of Occupancy: This facility has 78 employees.
Number of Computers: The facility has approximately 90 desktop and laptop computers.
Building Usage: Hours of operation are 8:30 AM – 4:15 PM Monday Wednesday and Friday. Hours of operation are 8:30 AM – 9:00 PM on Tuesday and Thursday. The building is closed on weekends.

Construction Materials: The building has reinforced concrete steel walls with R-19 batt insulation and 5/8" gypsum board.
Façade: Brick veneer
Roof: The building has a flat tar roof. The roof is in good condition and therefore no roof related ECMs are considered.
Windows: The building has double pane windows in the Annex and the North Wing. , The windows in South Wing are single pane windows. A window replacement ECM was evaluated for the South wing.
Exterior Doors: The building has aluminum frame doors. The door seals appear to be in good condition, therefore, no door ECMs are evaluated.

Heating Ventilation & Air Conditioning (HVAC) Systems

Heating: This facility has three sections (North Wing, Annex and South Wing) and each section has its own heating system.

The North Wing building is heated by two (2) Slant fin Galaxy heating hot water (HHW) boilers. Each of the boilers has a rated energy input of 375 MBH and energy output of 304 MBH which results in a nameplate efficiency of 81.1%. The HHW is circulated by two HHW pumps driven by 1.5 HP motors to the floor mounted fan coil units in the North Wing building. Each fan coil unit is equipped with a HHW coil and a chilled water cooling coil.

The Annex section is heated by two Patterson-Kelly Thermific boilers which have a rated 700 MBH energy input and 595 MBH energy output which results in a nameplate efficiency of 85%. Each room in the perimeter area has a floor mounted packaged terminal air conditioning (PTAC) unit which is equipped with a HHW coil for heating.

The South Wing building has a ducted variable air volume (VAV) system with hot water reheat coils to provide heating The HHW for the VAV system is provided by an old boiler having two burners located in the South Wing penthouse mechanical room. The nameplate on the boiler is missing however the boiler capacity obtained from the drawings is 480 MBH. The HHW is circulated by two pumps driven by 1.5 HP electric motors. A Carrier air handling unit (AHU) equipped with HHW pre-heat coil and a DX cooling coil is used to provide 55F conditioned air to the VAV system. The supply fan in the Carrier AHU uses inlet guide vanes instead of VFD to adjust the air flow rate according to the duct static pressure. Perimeter serving VAV boxes are equipped with a HHW reheat coil while internal space units do not have re-heat coils. A few electric heaters are also used to provide supplemental heat in this wing.

Several alternative energy efficient heating systems are proposed in the ECMs section.

Cooling: The majority of the North Wing section is cooled by an air cooled York chiller located on the North Wing roof. The chiller has a rated cooling capacity of 44 tons. Chilled water is circulated by two chilled water pumps driven by 3 HP electric motors. Each room has a floor mounted fan coil equipped with a chilled water coil with the exception of the mail room, server room and one office which are cooled by three individual split DX cooling units.

The Annex inner offices are cooled by an AHU equipped with a Trane 20 ton DX cooling unit and the perimeter offices are cooled by packaged terminal air conditioning (PTAC) units. The Trane DX condensing unit is located outdoors on the east side. In addition to the central Trane unit, there are twelve (12) Sanyo split DX cooling units added in 2011 for the inner office rooms. Each Sanyo evaporator has a rated 11,900 BTH cooling capacity. Three Sanyo condensing units located on the east side outdoor ground are used to work with these evaporators.

The South Wing section uses the aforementioned VAV system which uses a 38 ton Carrier DX condensing unit located on the South Wing roof to provide cooling.

Several alternative energy efficient cooling systems are proposed in the ECMs section.

Ventilation: The North Wing and Annex are ventilated by the floor mounted fan coils in each perimeter room. Each unit has an exterior opening with a louver to bring outside air in which varies from 20 CFM to 40 CFM based on the room size. The South Wing is ventilated by the

Carrier AHU which brings 20% outdoor air (3,600 CFM) for ventilation constantly (according to the drawings). Demand control ventilation was evaluated for this unit.

Exhaust: This building has multiple fractional HP exhaust fans serving restrooms. No ECMs were evaluated for the exhaust fans

Controls Systems

The HVAC systems in North Wing and Annex are manually controlled by the facility staff and no thermostats were observed in these two sections. All the fan coil units and split AC units in the North Wing and Annex are controlled by manual switches. The building temperature is not well controlled. In discussions with the maintenance staff, there is no night temperature setback implemented.

A SIEBE control system is used to control the VAV system in the South Wing. Each zone (VAV box) in the South Wing has its own thermostat; however, maintenance staff personal told us that this control system is no longer functioning properly. Temperatures in the south wing were observed to be 79 ^{0}F. An ECM to upgrade the control system to full DDC is included

Domestic Hot Water Systems

The North Wing is served by a gas fired A. O Smith domestic hot water (DHW) heater. This heater has a rated 50 MBH energy input and 50 gallon storage. The Annex is served by an electric water heater made by Bradford White. This heater has a rated 18 kW heating capacity and 115 gallon storage. The South Wing has three (3) electric DHW heaters: each one serves one floor. Replacing the Annex DHW electric heater with one high efficiency gas fired condensing water heater was evaluated.

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 single 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.

Plug Load

This building has computers, copiers, residential appliances (microwave, refrigerator), and printers which contribute to the plug load in the building. No ECM was evaluated for these units due to the small capacities and quantities of these appliances.

Lighting Systems

The building has a mixture of T-12, T-8 fluorescent lighting, a few CFLs and some incandescent lights. The majority of lighting fixtures in the Annex and South Wing are T-12 fluorescent U-shape and linear fixtures. The majority of lighting fixtures in the North Wing are T-8 fluorescent U-shape and linear fixtures. The janitor storage rooms have CFLs and the mechanical rooms have incandescent lights. Many of the rooms were in use during the site visit and these rooms were not accessible because of the patient privacy policy. Therefore, the fixture counts in these rooms are provided by facility staff. All of the lights in this building are controlled by manual

switches. After discussions with facility staff, it was noted that the office lights are typically turned off after the office hours and the hallway lights are on 24/7. The exterior lights are wall mounted metal halide fixtures controlled by two timers; however, the timer schedule was unknown. 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

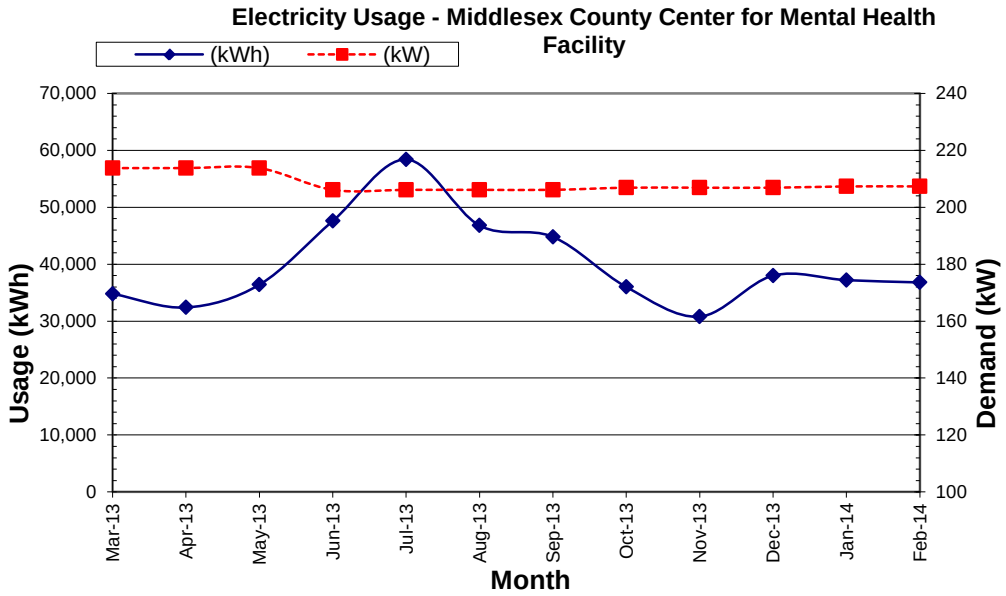
Utilities used by the building are delivered and supplied by the following utility companies:

	Electric	Natural Gas
Deliverer	PSE&G	Elizabethtown Gas
Supplier	PSE&G	Amerada Hess Corp

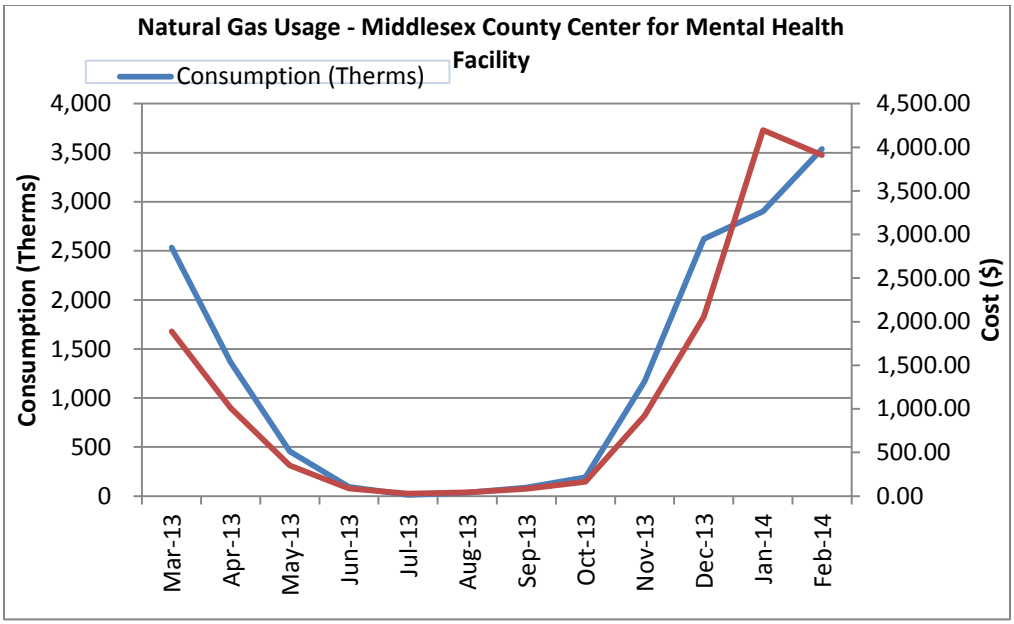
For the 12-month period ending in February 2014, the utilities usages and costs for the building were as follows:

Electric		
Annual Consumption	480,000	kWh
Annual Cost	$89,767	$
Blended Unit Rate	$0.19	$/kWh
Supply Rate	$0.12	$/kWh
Demand Rate	$12.02	$/kW
Peak Demand	213.8	kW
Natural Gas		
Annual Consumption	15,008	Therms
Annual Cost	$14,746	$
Unit Rate	$0.98	$/therm

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



The electricity usage is increased in the summer season when the air conditioning systems are used. The electric remains fairly constant during the remaining months. The peak usage appears in July which is believed to be the hottest month in 2013. The peak demand of this building remains pretty constant throughout the year.



Natural gas in 2013 was consumed by the hot water heating system and one domestic hot water heater. The NG usage according to the graph above depicts pretty typical HHW usage; the usage is increased when the outdoor temperature is decreased. The peak gas usage is in February 2014 which is believed to be the coldest month in the past 12 months.

See Appendix A for a utility analysis.

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

Comparison of Utility Rates to NJ State Average Rates*				Recommended to Shop for Third Party Supplier?
Utility	Units	Average Rate	NJ Average Rate	
Electricity	$/kWh	$0.19	$0.12	Y
Natural Gas	$/Therm	$0.98**	$0.95	Y

* Per U.S. Energy Information Administration (2013 data – Electricity and Natural Gas, 2012 data – Fuel Oil)
**estimated supply rate due to missing data

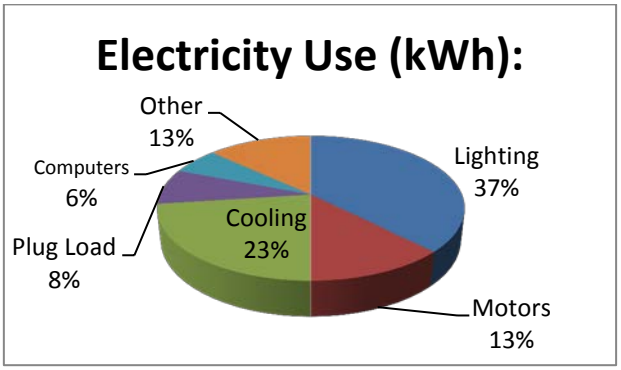
Additional information on selecting a third party energy supplier is available here:

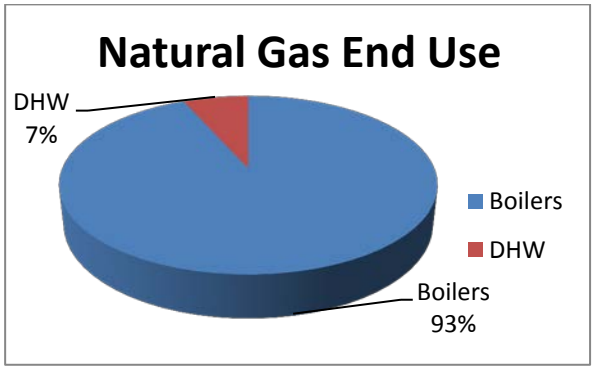
http://www.state.nj.us/bpu/commercial/shopping.html.

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.

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 Portfolio Manager benchmarking are contained in the table below.

Site EUI kBtu/ft^2/yr	Source EUI kBtu/ft^2/yr	Energy Star Rating (1-100)
78.5	168	66

The facility has an above average Energy Star Rating Score (50 being the median score), and is therefore considered a slightly above average energy efficient building. By implementing the measures outlined in this report, the site energy use intensity will decrease and the Energy Star Rating will increase.

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.

- 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.

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 Window Replacement

This measure evaluates the energy savings for replacing the old single pane windows in the South Wing which are original to the building, with double pane windows that have better seals and insulation value. Replacement of these windows will result in a reduction of the buildings heating and cooling loads, therefore resulting in both electric and natural gas savings.

Energy savings for this measure were calculated by estimating the reduction in the heat transfer loss and the infiltration rate through the windows. The U value of the windows will be reduced from 0.80 Btuh/SF/^{o}F to 0.40 Btuh/SF/^{o}F and the infiltration factor is reduced from 0.20 CFM/LF to 0.10CFM/LF after upgrading the windows to double glazed windows with better seals.

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

ECM-1 Window Replacement

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$		$	Years	Years
22,200	0	136	210	231	(0.7)	0	96.0	96.0

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

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

5.2 Replace Existing HVAC Systems

The existing HVAC systems in this building are nearing the end or past their useful life and require excessive maintenance every year. Additionally, the systems still do not provide satisfactory heating/cooling comfort for the occupants, specifically poor temperature control. It is therefore recommended to replace all of the HVAC systems. In this section, ECM-2A considers replacing the existing HVAC systems “in kind” and repairing any piping/ducting issues in the systems. ECM-2B recommends replacing the three different HVAC systems with one variable refrigerant volume (VRV) system which will reduce maintenance cost significantly and provide improved comfort levels for the occupants.

5.2.1 ECM-2A Replace Existing HVAC Systems Option A – In Kind

This building has three different heating systems: the North Wing building is heated by two (2) Slant-fin Galaxy heating hot water (HHW) boilers which supply HHW for fan coil units, the Annex section is heated by two Patterson-Kelly Thermific boilers which provide HHW for PTHP units and the South Wing has a 480 MBH boiler which supplies HHW for the VAV system. The boilers/burners are running at lead/lag mode. The existing boilers are of the non-condensing type and have maximum thermal efficiencies in the 80-85% range. New modulating condensing gas boilers are available that minimally operate at 88%, and can operate as high as 96%.

Similarly, the building has three different cooling systems. The majority of the Annex Section is cooled by a Trane 20 ton direct expansion (DX) cooling system which has the condensing unit located at grade on the east side of the building. According to the maintenance staff, this condensing unit has freezing problems during shoulder seasons. It is possible that this DX unit is oversized and/or has poor control. The South Wing also has a DX cooling unit serving the VAV system. This DX condensing unit is located on the roof and appears to be in poor condition. High efficiency DX units with EERs of 14 or greater will reduce energy consumption as well as annual maintenance costs The

North Wing building is cooled using an air-cooled scroll type chiller located on the roof. The chiller has a rated capacity of 44 tons with an energy efficiency ratio (EER) of 11.5. Additionally, it was observed that the chilled water pipes are not properly insulated, further impacting the overall system efficiency. It is suggested that a high efficiency chiller with a rated EER of 13 or higher replace the existing chiller, and that the piping be insulated. It was also noted that the terminal units are not working properly, the piping systems have insulation issues and the ductwork systems have air balance problems after discussion with the facility staff. Therefore, this measure also considers replacing the terminal units, insulating the pipes/ducts, fixing the VAV boxes, and doing an air balance adjustment for the ductwork.

The existing HVAC systems also do not have a central automatic control system or local programmable thermostats. Most of the terminal units are manually controlled and the HVAC system has difficulty to maintain the comfortable level in the building. A central Direct Digital Control (DDC) building automation system consists of automatic control of individual space heating and ventilation equipment, and provides monitoring, trending and alarms which notify an operator when a piece of equipment fails or operates outside a given set-point. This system allows for the implementation of energy efficient strategies, such as: time of day (TOD) optimization, set point optimization, staggered start, night setback, temporary daytime setback, and holiday TOD optimization. It also allows for remote access and control of the building's systems.

To implement this ECM, all the boilers would be removed and the new boilers and primary pumps put in the basement mechanical room. It is suggested to install the new condensing boilers in the penthouse mechanical room which will provide space for the boiler flue gas venting. Piping and wiring modifications would be needed. The supply and return water temperatures might need to be lowered in order to generate the highest energy savings. The DX systems for fan coil units and AHU as well as the chilled water system would be replaced. Also, the terminal units, pipes, valves, fittings, ductwork and accessories should be inspected and replaced if necessary. After the HVAC systems are fully renovated, a DDC system should be installed to optimize the energy savings potential of the new systems.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below and it should be noted that this measure could also result in significant maintenance cost savings which are listed as follows:

ECM-2A Replace Existing HVAC Systems Option A - in Kind

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive *	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Main. Savings	Total				
$	kW	kWh	Therms	$	$	%	$	Years	Years
1,193,948	10	43,651	2,224	13,745	22,650	(0.8)	9,964	52.7	52.3

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

5.2.2 ECM-2B Replace Existing HVAC Systems Option B - Variable Refrigerant Volume System

This measure is an alternative to ECM-2A. Compared with ECM-2A, the VRV system is a long term solution to the existing HVAC problems. Installing a VRV system will meet the comfort and installation needs of the facility, allowing for a less-invasive installation

and individual space temperature set points. VRV systems are becoming more common place as they do provide heating and cooling in an energy efficient manner and require less maintenance than a typical VAV or fan coil system.

Currently, the existing separated HVAC systems have a lot of maintenance problems: the heating hot water pipes have burst in cold weather, the VAV system does not work properly, the fan coil unit outdoor air intake has significant infiltration and temperature controls are nearly non-existent. Additionally it is not energy efficient to have three different types of HVAC systems in one building. This measure looks at replacing the three existing HVAC systems with one high efficiency variable refrigerant volume (VRV) system. A VRV heat pump system includes individual room mounted fan coils that are connected to a centrally located outdoor heat pump condensing unit by high pressure refrigerant piping. The advantage of this system over a traditional hydronic system or DX system is that some of the indoor fan coil units can operate in heating mode while others operate in cooling mode and the shared piping transfers the heat between the units essentially recovering the energy. This type of system also lends itself well to retrofit projects as there is less disruption to the occupants due to the relatively ease of piping installation verses installing hydronic piping and ductwork. Finally, a VRV system can be controlled by the individual occupants providing specific temperature set points and is easily networked to provide global night set-back, system troubleshooting and trending.

The calculation uses annual electrical/natural gas consumption and electrical cost as the baseline, vs. the reduced electrical consumption and cost for the proposed case. The electrical consumption of the VRV system is calculated based on manufacturer's online calculation tool. The difference between the two values is the energy savings.

The implementation cost and savings related to this ECM are presented in Appendix C and summarized below and it should be noted that this measure could also result in significant maintenance cost savings which are listed as follows:

ECM-2B Replace Existing HVAC Systems Option B - Variable Refrigerant Volume (VRV) System

Budgetary Cost	Annual Utility Savings					ROI	Potential Incentive *	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Main. Savings	Total				
$	kW	kWh	Therms	$	$	%	$	Years	Years
1,519,028	0	-15,399	12,757	13,745	23,367	(0.9)	8,640	65.0	64.6

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

An overhaul of the HVAC systems is a large capital investment. These two measures (2A and 2B) are listed for the county to consider. Since the existing three HVAC systems are problematic, it may be beneficial for the County to invest in Option 2B, and install a new modern VRV system. The benefits associated with such a system would include reduced maintenance and improved occupant comfort levels, and may justify the incremental additional cost.

5.3 ECM-3 Replace Electric DHW Heater with a Gas Fired Condensing DHW Heater

The Annex is served by an electric water heater made by Bradford White. This heater has a rated three 6 kW heating capacity. Typically, only one element (6kW) is needed

when the Annex needs hot water. Energy savings could be realized by replacing the existing units with one central high efficiency condensing gas fired heater, which can operate at efficiencies up to 96% and have less standby energy loss from the storage tank.

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

ECM-3 Replace Electric DHW Heater with a Gas Fired Condensing DHW Heater

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
31,341	6	4,808	-150	1,295	0.0	0	24.2	24.2

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

This measure is recommended.

5.4 ECM-4 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. Faucets 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-4 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
108,270	0	0	453	50	787	(0.8)	0	137.5	137.5

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

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

5.5 ECM-L1 Lighting Replacement / Upgrades

The existing lighting system consists of both T12 and T8 linear fluorescent fixtures. The Annex and South Wing are mostly T12 lights and North Wing was updated to T8 lights. 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
116,449	33	89,522	0	15,520	0.8	2,400	7.5	7.3

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

This measure is not recommended in lieu of ECM-L3.

5.6 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 ECM-L1, the energy savings for this measure was calculated by applying the known fixture wattages in the space to the estimated existing and proposed times of operation for each fixture.

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

ECM-L2 Install Lighting Controls (Occupancy Sensors)

Budgetary Cost	Annual Utility Savings				ROI	Potential Incentive*	Payback (without incentive)	Payback (with incentive)
	Electricity		Natural Gas	Total				
$	kW	kWh	Therms	$	%	$	Years	Years
41,310	0	20,129	0	2,415	(0.1)	5,355	17.1	14.9

* 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.

5.7 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
157,759	33	97,373	0	16,462	0.5	7,755	9.6	9.1

* 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.

5.8 Additional O&M Opportunities

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

- Set computers monitors to turn off and computers to sleep mode when not in use
- Disconnect unnecessary or unused small appliances and electronics when not in use to reduce phantom loads
- Develop an Energy Master Plan to measure and track energy performance

In addition to the measures mentioned above, it is also suggested that the facility consider the Curtailment Service Provider (CSP) program to shed the demand and save electricity cost. Please see Section 7 for more details.

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 owner wishes to and is eligible to participate in the ESIP program and/or the P4P Incentive Program, 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 Berkeley Heights BOE upon successful replacement and payment of the equipment.

The building does not qualify for this program because its electrical demand is greater 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)

The facility 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. Facilities that meet this criterion must also achieve a minimum performance target of 15% energy reduction by using the EPA Portfolio Manager benchmarking tool before and after implementation of the measure(s). Additionally, the overall return on investment (ROI) must exceed 10%. If the participant is a municipal electric company customer, and a customer of a regulated gas New Jersey Utility, only gas measures will be eligible under the Program. Available incentives are as follows:

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

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

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

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

<u>Electric</u>

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

Gas

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

Incentive cap: 25% of total project cost

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

Electric

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

Gas

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

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

For the purpose of demonstrating the eligibility of the ECM's to meet the minimum savings requirement of 15% annual savings and 10% ROI for the Pay for Performance Program, all ECM's identified in this report have been included in the incentive calculations. The results for the building are shown in Appendix C, along with more detailed program information provided 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. This can be done over a maximum term of 15 years. 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 ECM Photovoltaic Rooftop Solar Power Generation

The building was evaluated for the potential to install rooftop photovoltaic (PV) solar panels for power generation. Present technology incorporates the use of solar cell arrays that produce direct current (DC) electricity. This DC current is converted to alternating current (AC) with the use of an electrical device known as an inverter. The amount of available roof area determines how large of a solar array can be installed on any given roof. The table below summarizes the approximate roof area available on the building and the associated solar array size that can be installed.

Available Roof Area (Ft^2)	Potential PV Array Size (kW)
4,243	30

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

Installation of (PV) arrays in the state New Jersey will allow the owner to participate in the New Jersey Solar Renewable Energy Certificates Program (SREC). This is a program that has been set up to allow entities with large amounts of environmentally unfriendly emissions to purchase credits from zero emission (PV) solar-producers. An alternative compliance penalty (ACP) is paid for by the high emission producers and is set each year on a declining scale of 3% per year. One SREC credit is equivalent to 1000 kilowatt hours of PV electrical production; these credits can be traded for period of 15 years from the date of installation. Payments that will be received by the PV producer (facility) will change from year to year dependent upon supply and demand. There is no definitive way to calculate an exact price that will be received by the PV producer for SREC credits over the next 15 years. Renewable Energy Consultants estimates an average of $175/SREC for May 2014 and this number was utilized in the cash flow for this report.

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

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

Photovoltaic (PV) Rooftop Solar Power Generation – 30 kW System

Budgetary Cost	Annual Utility Savings			Total Savings	New Jersey Renewable SREC	Payback (without incentive)	Payback (with incentives)	Recommended
	Electricity		Natural Gas					
$	kW	kWh	Therms	$	$	Years	Years	Y/N
$120,000	30.0	34,664	0	$6,482	$6,066	18.5	9.6	FS

Note: CHA typically recommends a more detailed evaluation be conducted for the installation of PV Solar arrays when the screening evaluation shows a payback of less than 20 years. Therefore, this ECM is recommended for further study. Before implementation is pursued, the owner should consult with a certified solar PV contractor.

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.

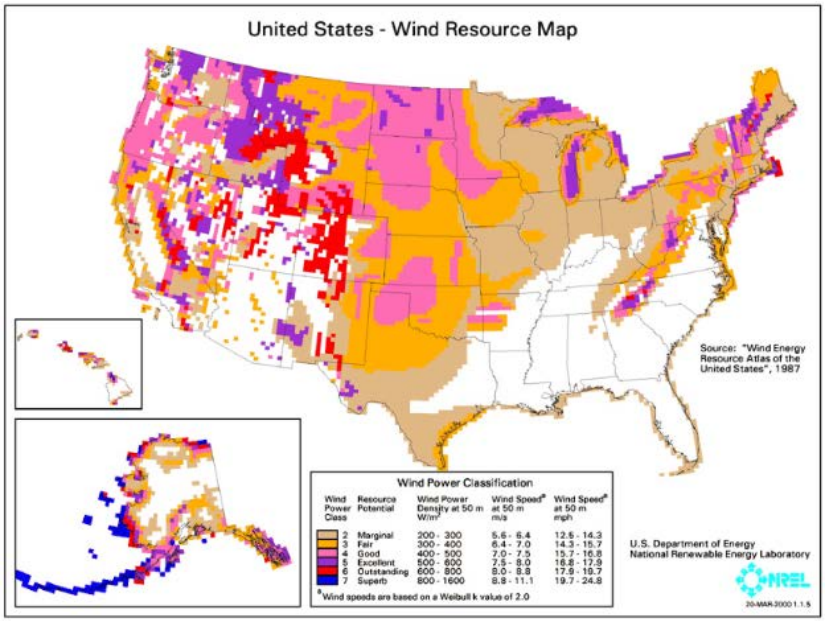
Several options exist for using active solar thermal systems for space heating. The most common method is called a passive solar hot water system involves using glazed collectors to heat a liquid held in a storage tank (similar to an active solar hot water system described above which requires pumping).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

This measure is not recommended due to the small usage of domestic hot water.

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 lack of space and wind available at the location of the facility.

7.3 Combined Heat and Power Plant

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

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

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

This measure is not recommended due to the lack of year round thermal load that is required for a CHP system to be operating cost effectively.

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 March 2013 through February 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
213.8	206.1	208.6	Y	Y

This measure is recommended.

8.0 CONCLUSIONS & RECOMMENDATIONS

The LGEA energy audit conducted by CHA for the building identified several energy savings opportunities. The following measures are recommended for implementation:

- Replace Existing HVAC System with VRV System
- Replace Electric DHW Heater with a Gas Fired Condensing DHW Heater
- Lighting Replacements with Controls (Occupancy Sensors)

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

- Photovoltaic (PV) Rooftop Solar Power Generation – 30 kW System

Next Steps: This energy audit has identified several areas of potential energy savings. George J. Otlowski sr. Middlesex county center for mental health can use this information to pursue incentives offered by the NJBPU's NJ Clean Energy Program.

APPENDIX A

Utility Usage Analysis and Alternate Utility Suppliers

Middlesex County Center for Mental Health Facility
570 Lee Street Perth Amboy NJ 08861

Utility Bills: Account Numbers

Account Number	School Building	Location	Type	Notes
42 004 777 18	Middlesex County Center for Mental Health Facility	570 Lee Street Perth Amboy NJ 08861	Electricity	
2757625131	Middlesex County Center for Mental Health Facility	570 Lee Street Perth Amboy NJ 08861	Natural Gas	

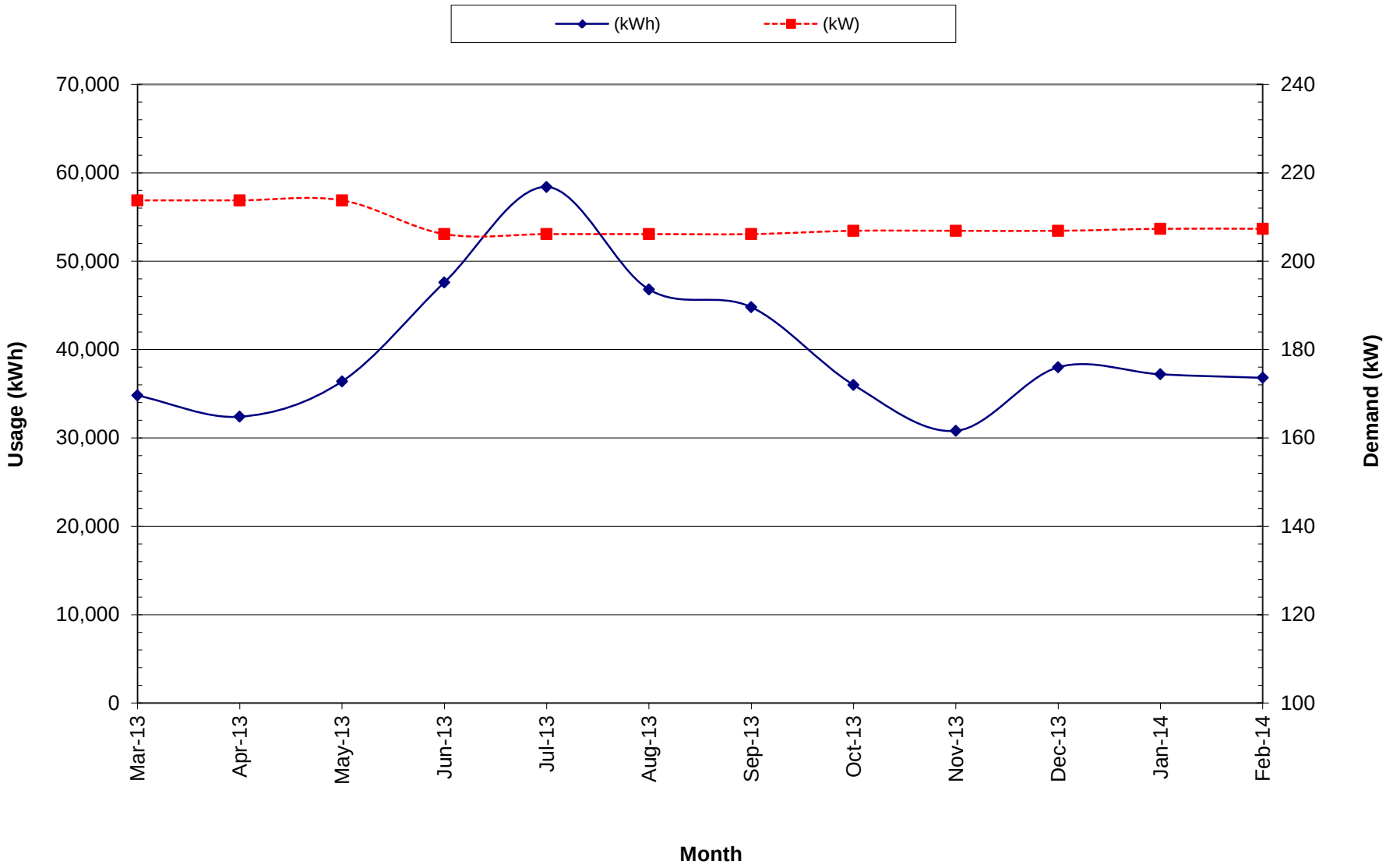
Middlesex County Center for Mental Health Facility
570 Lee Street Perth Amboy NJ 08861

For Service at: **Middlesex County Center for Mental Health Facility**
Account No.: **42 004 777 18** **Delivery -** PSE&G
Meter No.: **778018271** **Supplier -** PSE&G
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 Rate ($/kWh)**	**Demand ($/kW)**
March-13	34,800	213.8	$ 1,749.98	$ 4,495.65	$6,245.63	$ 3,894.74	$ 2,350.89	$ 0.18	$ 0.11	$ 11.00
April-13	32,400	213.8	$ 1,990.04	$ 4,794.32	$6,784.36	$ 4,234.98	$ 2,549.38	$ 0.21	$ 0.13	$ 11.93
May-13	36,400	213.8	$ 4,206.92	$ 5,636.64	$9,843.56	$ 7,137.12	$ 2,706.44	$ 0.27	$ 0.20	$ 12.66
June-13	47,600	206.1	$ 4,440.66	$ 6,292.88	$10,733.54	$ 8,055.43	$ 2,678.11	$ 0.23	$ 0.17	$ 12.99
July-13	58,400	206.1	$ 3,659.55	$ 5,346.61	$9,006.16	$ 6,455.65	$ 2,550.51	$ 0.15	$ 0.11	$ 12.37
August-13	46,800	206.1	$ 3,696.76	$ 5,281.82	$8,978.58	$ 6,399.46	$ 2,579.12	$ 0.19	$ 0.14	$ 12.51
September-13	44,800	206.1	$ 2,030.78	$ 4,449.91	$6,480.69	$ 3,953.99	$ 2,526.70	$ 0.14	$ 0.09	$ 12.26
October-13	36,000	206.9	$ 1,746.49	$ 4,080.08	$5,826.57	$ 3,427.00	$ 2,399.57	$ 0.16	$ 0.10	$ 11.60
November-13	30,800	206.9	$ 1,939.58	$ 4,519.76	$6,459.34	$ 4,088.13	$ 2,371.21	$ 0.21	$ 0.13	$ 11.46
December-13	38,000	206.9	$ 1,888.71	$ 4,460.75	$6,349.46	$ 3,944.43	$ 2,405.03	$ 0.17	$ 0.10	$ 11.63
January-14	37,200	207.3	$ 1,846.57	$ 4,605.55	$6,452.12	$ 4,075.26	$ 2,376.86	$ 0.17	$ 0.11	$ 11.46
February-14	36,800	207.3	$ 1,798.64	$ 4,808.11	$6,606.75	$ 4,024.91	$ 2,581.84	$ 0.18	$ 0.11	$ 12.45
Total (last 12-months)	**480,000**	**213.77**	**$30,994.68**	**$58,772.08**	**$89,766.76**	**$59,691.10**	**$30,075.66**	**$ 0.187**	**$ 0.12**	**$ 12.02**
Notes	1	2	3	4	5	6	7	8	9	10

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

Electricity Usage - Middlesex County Center for Mental Health Facility



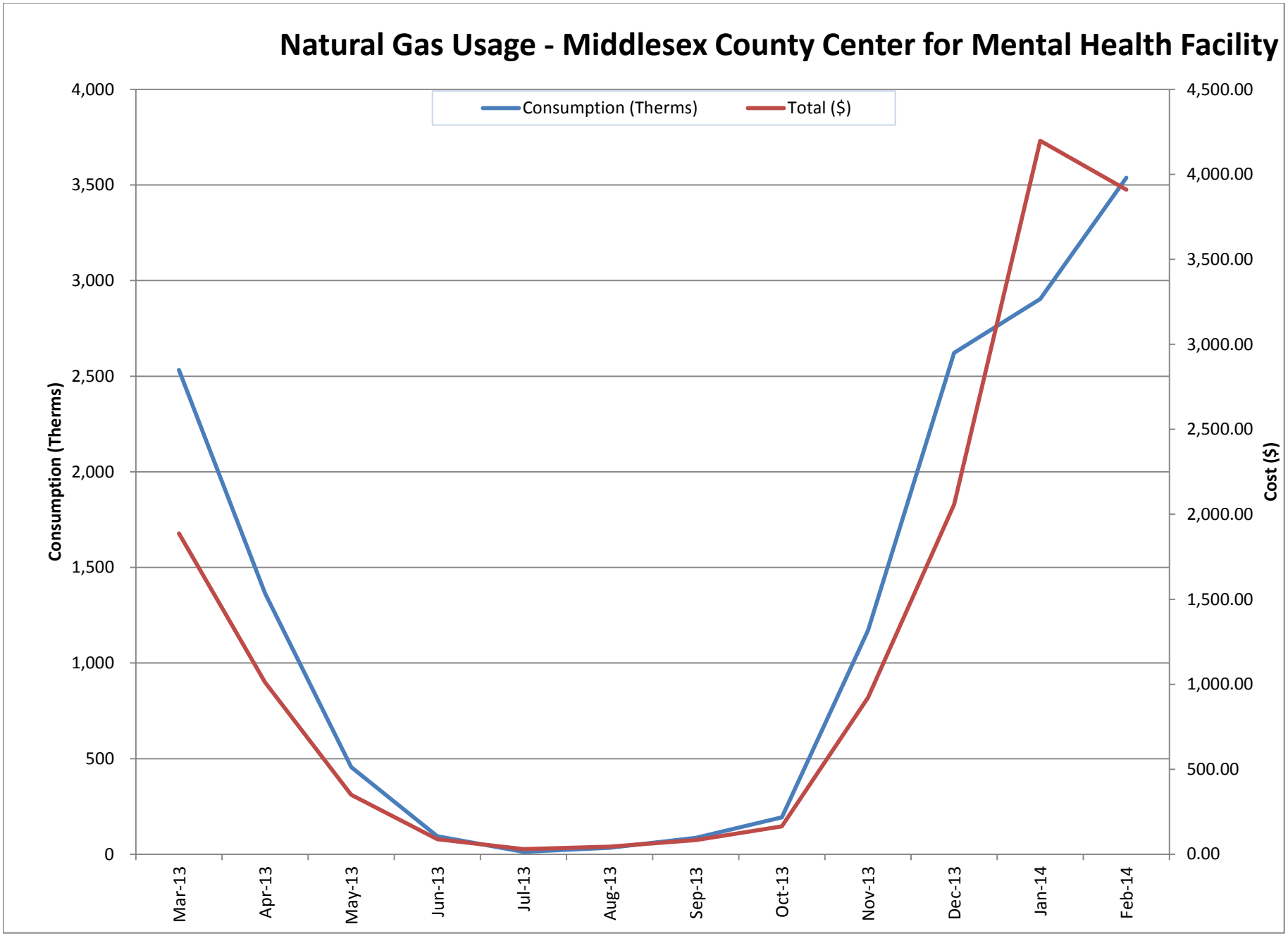
Utility Data - Middlesex County Center for Mental Health Facility
Electric Graph

Middlesex County Center for Mental Health Facility
570 Lee Street Perth Amboy NJ 08861

For Service at: **Middlesex County Center for Mental Health Facility**
Account No.: **2757625131**
Meter No.: **9538502**
Natural Gas Service
Delivery - Elizabethtown Gas
Supplier - Amerada Hess Corp

		Charges			Unit Costs		
Month	**Consumption (Therms)**	**Delivery ($)**	**Supply ($)**	**Total ($)**	**Delivery ($/Therm)**	**Supply ($/Therm)**	**Total ($/Therm)**
March-13	2,533	$ 875	$ 1,013	$ 1,888	$ 0.35	$ 0.40	$ 0.75
April-13	1,365	$ 465	$ 546	$ 1,011	$ 0.34	$ 0.40	$ 0.74
May-13	456	$ 168	$ 182	$ 350	$ 0.37	$ 0.40	$ 0.77
June-13	94	$ 51	$ 38	$ 88	$ 0.54	$ 0.40	$ 0.94
July-13	13	$ 24	$ 5	$ 30	$ 1.83	$ 0.40	$ 2.23
August-13	33	$ 31	$ 13	$ 44	$ 0.93	$ 0.40	$ 1.33
September-13	86	$ 49	$ 35	$ 83	$ 0.56	$ 0.40	$ 0.96
October-13	193	$ 88	$ 77	$ 165	$ 0.45	$ 0.40	$ 0.85
November-13	1,170	$ 454	$ 468	$ 922	$ 0.39	$ 0.40	$ 0.79
December-13	2,623	$ 1,008	$ 1,049	$ 2,057	$ 0.38	$ 0.40	$ 0.78
January-14	2,904	$ 3,037	$ 1,162	$ 4,198	$ 1.05	$ 0.40	$ 1.45
February-14	3,538	$ 2,494	$ 1,415	$ 3,910	$ 0.70	$ 0.40	$ 1.10
Total (12 - Month)	**15,008**			**$ 14,746.04**			**$ 0.98**

Estimed value due to missing bills


Natural Gas Usage - Middlesex County Center for Mental Health Facility
Consumption (Therms)
Total ($)
Consumption (Therms)
Cost ($)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
4,500.00
4,000.00
3,500.00
3,000.00
2,500.00
2,000.00
1,500.00
1,000.00
500.00
0.00
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Feb-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 # 28344
Middlesex County Mental Health Center

Description	QTY	Manufacturer Name	Model No.	Serial No.	Equipment Type / Utility	Capacity/Size /Efficiency	Location	Areas/Equipment Served	Date Installed	Remaining Useful Life (years)	Other Info.	Current year	Years Old	ASHRAE life expectancy
B-3	1	Slant Fin Galaxy	GG-375 HEC	G0025144	HHW Boiler	375 MBH input, 304 MBH output 81.1 % Eff.	North Basement MR	North Wing Building	2001	12		2014	13	25
B-4	1	Slant Fin Galaxy	GG-375 HEC		HHW Boiler	375 MBH input, 304 MBH output 81.1 % Eff.	North Basement MR	North Wing Building	2001	12		2014	13	25
HHW Pump-6 Motor	1	Dayton	3KW28G	HR5066209107	HHW Pump/Motor	1.5HP 84%	North Basement MR-2	North Wing Building	2001	7		2014	13	20
HHW Pump-7 Motor	1	Baldor	M37647	35810147586H1	HHW Pump/Motor	1.5HP 84%	North Basement MR-2	North Wing Building	2001	7		2014	13	20
Chiller-North	1	York	YCAL0044SC1	RAKM6310AA	Air Cooled Chiller for the North Building CHW System	44 ton cooling	North Building Roof	North Wing Building	2001	7		2014	13	20
CHW Pump Motor	1	Baldor	M32111	35L411R620H1	CHW Pump/Motor	3HP 86.5%	North Basement MR-2	North Wing Building	2001	7		2014	13	20
CHW Pump Motor	1	Baldor	M32111		CHW Pump/Motor	3HP 86.5%	North Basement MR-2	North Wing Building	2001	7		2014	13	20
Split Unit -1	1	Sanyo	H0951	00014551	Split Unit	9 MBH Cooling	Annex Roof	North Wing Building Offices & Mail Room	2001	7		2014	13	20
Split Unit -2	1	Sanyo	CL0952	0026232	Split Unit	9 MBH Cooling	Annex Roof	North Wing Building Offices & Mail Room	2001	7		2014	13	20
Split Unit -3	1	Mitsubishi	MUY-D36NA	2001559	Split Unit	34.6 MBH Cooling	Annex Roof	North Wing Building Offices & Mail Room	2001	7		2014	13	20
B-1	1	Patterson-Kelly	N-700		HHW Boiler	700 MBH Input and 595 MBH Output, 85% Eff.	Annex Basement MR	Annex Buuilding	1998	4		2014	16	20
B-2	1	Patterson-Kelly	N-700		HHW Boiler	700 MBH Input and 595 MBH Output, 85% Eff.	Annex Basement MR	Annex Buuilding	1998	4		2014	16	20
DHW-1	1	A O Smith	BT 65 222	MG98-0755895-222	Natural gas fired domestic hotw water heater	50 MBH input 50 gallon	Annex Basement MR	North Building	1994	0		2014	20	20
DHW-2	1	Bradford White	M11120183CF37	C08406159	Electric DHW Heater	18kW	Annex Basement MR	Annex Buuilding	1998	4		2014	16	20
DX for Annex	1	Trane	TTA240	M2733G7AH	Split DX Cooling System	20 ton cooling	Ground floor next to the east side of the Annex building	Annex Buuilding	1997	3		2014	17	20
Split Unit -1	1	Sanyo	CMH2472	28764	Split Unit	23.2 MBH Cooling	Ground floor next to the east side of the Annex building	Annex Buuilding	2011	17		2014	3	20
Split Unit -2	1	Sanyo	CMH2472	28764	Split Unit	23.2 MBH Cooling	Ground floor next to the east side of the Annex building	Annex Buuilding	2011	17		2014	3	20
Split Unit -3	1	Sanyo	CMH3172A	0007211	Split Unit	30.6 MBH Cooling	Ground floor next to the east side of the Annex building	Annex Buuilding	2011	17		2014	3	20
DX for South Wing	1	Fade Away N/A	Fade Away N/A	Fade Away N/A	Split DX Cooling System	Fade Away N/A	South Wing Roof	South Wing Building	1988	-6		2014	26	20
Boiler - South Wing	1	Hydrotherm	N/A	N/A	HHW Boiler	N/A	South Wing Roof Penthouse MR	South Wing Building	1988	-6		2014	26	20
AHU - South Wing	1	Carrier	VAV AHU System	N/A	AHU	18000 CFM with 3600 CFM O.A	South Wing Roof Penthouse MR	South Wing Building	1988	-6		2014	26	20
DHW-3	1	Bradford White	M120U6SS-1NAL	DC8879453	Electric DHW Heater	1.5 kW	South Wing 1st Floor	South Wing Building	2000	6		2014	14	20
DHW-4	1	Bradford White	M120U6SS-1NAL		Electric DHW Heater	1.5 kW	South Wing 2nd Floor	South Wing Building	2000	6		2014	14	20
DHW-5	1	Bradford White	M120U6SS-1NAL		Electric DHW Heater	1.5 kW	South Wing 3rd Floor	South Wing Building	2000	6		2014	14	20

Energy Audit of Middlesex County Mental Health Center
CHA Project No.28344
Existing Lighting & Audit Input

Cost of Electricity: **$0.120** **$/kWh**
$12.02 **$/kW**

			EXISTING CONDITIONS									
	Area Description	Usage	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Retrofit Control	
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
7LED	North Wing Room 300	Offices	10	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.60	SW	1600	960	C-OCC	
18LED	North Wing Room 303	Offices	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	1600	717	C-OCC	
18LED	North Wing Room 304	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 305	Offices	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	1600	717	C-OCC	
18LED	North Wing Room 306	Offices	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	1600	717	C-OCC	
18LED	North Wing Room 307	Offices	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	1600	717	C-OCC	
18LED	North Wing Room 308	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 309	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 310	Offices	3	T 32 R F 4 (ELE)	F44ILL	112	0.34	SW	1600	538	C-OCC	
18LED	North Wing Room 311	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 312	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 313	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 314	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 315	Conference	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	1600	717	C-OCC	
18LED	Men's Room	Restroom w/o OCC	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	1600	179	C-OCC	
18LED	Women's Room	Restroom w/o OCC	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	1600	179	C-OCC	
18LED	3rd Floor Hallway	Hallways	12	T 32 R F 4 (ELE)	F44ILL	112	1.34	SW	8736	11,741	NONE	
18LED	North Wing Group Room 200	Conference	6	T 32 R F 4 (ELE)	F44ILL	112	0.67	SW	1600	1,075	C-OCC	
18LED	North Wing Group Room 201	Conference	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	1600	717	C-OCC	
18LED	North Wing Room 202	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 203	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 204	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 205	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 206	Offices	3	T 32 R F 4 (ELE)	F44ILL	112	0.34	SW	1600	538	C-OCC	
18LED	North Wing Room 207	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 208	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 209	Offices	3	T 32 R F 4 (ELE)	F44ILL	112	0.34	SW	1600	538	C-OCC	
18LED	North Wing Room 210	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 211	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 212	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 213	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 214	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 215	Offices	4	T 32 R F 4 (ELE)	F44ILL	112	0.45	SW	1600	717	C-OCC	
18LED	Men's Room	Restroom w/o OCC	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	1600	179	C-OCC	
7LED	Men's Room	Restroom w/o OCC	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	1600	96	C-OCC	
18LED	Women's Room	Restroom w/o OCC	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	1600	179	C-OCC	
7LED	Women's Room	Restroom w/o OCC	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	1600	96	C-OCC	
18LED	2nd Floor Hallway	Hallways	15	T 32 R F 4 (ELE)	F44ILL	112	1.68	SW	8736	14,676	C-OCC	
18LED	North Wing Room 103	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 104	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 105	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 106	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 107	Offices	3	T 32 R F 4 (ELE)	F44ILL	112	0.34	SW	1600	538	C-OCC	
18LED	North Wing Room 108	Offices	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	1600	179	C-OCC	
18LED	North Wing Room 109	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 110	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 111	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 112	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 113	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 114	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 115	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Room 116	Offices	3	T 32 R F 4 (ELE)	F44ILL	112	0.34	SW	1600	538	C-OCC	
18LED	2nd Floor Hallway	Hallways	16	T 32 R F 4 (ELE)	F44ILL	112	1.79	SW	8736	15,655	NONE	
18LED	Men's Room	Restroom w/o OCC	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	1600	179	C-OCC	
18LED	Women's Room	Restroom w/o OCC	1	T 32 R F 4 (ELE)	F44ILL	112	0.11	SW	1600	179	C-OCC	
18LED	North Wing Basement Computer Storage Room	Storage Areas	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Basement Maintenance Supervisor Office	Offices	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
18LED	North Wing Basement Supply Room	Storage Areas	2	T 32 R F 4 (ELE)	F44ILL	112	0.22	SW	1600	358	C-OCC	
46LED	Open Area	Storage Areas	10	W 32 C F 2 (ELE)	F42LL	60	0.60	SW	1600	960	C-OCC	
46LED	Maintenance Area	Storage Areas	3	W 32 C F 2 (ELE)	F42LL	60	0.18	SW	1600	288	C-OCC	
18LED	Records Room	Storage Areas	3	T 32 R F 4 (ELE)	F44ILL	112	0.34	SW	1600	538	C-OCC	
7LED	Boiler Room	Mechanical Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.06	SW	8736	524	C-OCC	
18LED	Maintenance Area	Storage Areas	5	T 32 R F 4 (ELE)	F44ILL	112	0.56	SW	1600	896	C-OCC	
6LED	Annex Room 225	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 226	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 227	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 228	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 229	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 230	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 231	Offices	3	T 34 R F 4 (MAG)	F44EE	144	0.43	SW	1600	691	C-OCC	
6LED	Annex Room 232	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	

Energy Audit of Middlesex County Mental Health Center
CHA Project No.28344
Existing Lighting & Audit Input

Cost of Electricity: **$0.120** **$/kWh**
$12.02 **$/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
6LED	Annex Room 233	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 234 Records Room	Conference	8	T 34 R F 4 (MAG)	F44EE	144	1.15	SW	1600	1,843	C-OCC	
6LED	Annex Room 235 Lunch Room	Conference	8	T 34 R F 4 (MAG)	F44EE	144	1.15	SW	1600	1,843	C-OCC	
6LED	Annex Room 236	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 237	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 238	Offices	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
6LED	Annex Room 238A	Offices	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
4LED	Annex Room 238A	Offices	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.07	SW	1600	115	C-OCC	
6LED	Client Waiting Room	Hallways	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	8736	1,258	C-OCC	
6LED	Annex Room 123	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Annex Room 124	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	Men's Room	Restroom w/o OCC	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
6LED	Women's Room	Restroom w/o OCC	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
6LED	Annex Room 125	Offices	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
6LED	Annex Room 126	Offices	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
4LED	Annex Room 127	Offices	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.29	SW	1600	461	C-OCC	
61LED	Annex Room 128	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 129	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 130	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 131	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 132	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 133	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 134	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 135	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 136	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Annex Room 137	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
4LED	Hallway	Hallways	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.86	SW	8736	7,548	C-OCC	
6LED	South Wing Room 321	Offices	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
6LED	South Wing Room 322	Offices	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
6LED	South Wing Room 325	Offices	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	1600	230	C-OCC	
6LED	South Wing Room 326	Offices	7	T 34 R F 4 (MAG)	F44EE	144	1.01	SW	1600	1,613	C-OCC	
4LED	South Wing Room 327	Offices	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.86	SW	1600	1,382	C-OCC	
6LED	South Wing Room 328	Offices	6	T 34 R F 4 (MAG)	F44EE	144	0.86	SW	1600	1,382	C-OCC	
4LED	Traditional Room	Offices	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.43	SW	1600	691	C-OCC	
6LED	Traditional Room	Offices	4	T 34 R F 4 (MAG)	F44EE	144	0.58	SW	1600	922	C-OCC	
88	Restroom	Restroom w/o OCC	1	CF 13 1 LAMP	CFQ13/1-L	15	0.02	SW	1600	24	C-OCC	
88	Restroom	Restroom w/o OCC	1	CF 13 1 LAMP	CFQ13/1-L	15	0.02	SW	1600	24	C-OCC	
88	Closet	Storage Areas	1	CF 13 1 LAMP	CFQ13/1-L	15	0.02	SW	1600	24	C-OCC	
4LED	Hallway	Hallways	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.07	SW	8736	629	C-OCC	
6LED	Hallway	Hallways	1	T 34 R F 4 (MAG)	F44EE	144	0.14	SW	8736	1,258	C-OCC	
6LED	South Wing Room 240	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 241	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 242	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 243	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 244	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 245	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 246	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 247	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 248	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 249	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 250	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 251	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 252	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
6LED	South Wing Room 253	Offices	2	T 34 R F 4 (MAG)	F44EE	144	0.29	SW	1600	461	C-OCC	
41LED	Men's Room	Restroom w/o OCC	1	1B 40 R F 2 (MAG)	F42SS	94	0.09	SW	1600	150	C-OCC	
3	Men's Room	Restroom w/o OCC	1	W 34 W F 1 (MAG)	F41EE	43	0.04	SW	1600	69	C-OCC	
41LED	Women's Room	Restroom w/o OCC	1	1B 40 R F 2 (MAG)	F42SS	94	0.09	SW	1600	150	C-OCC	
3	Women's Room	Restroom w/o OCC	1	W 34 W F 1 (MAG)	F41EE	43	0.04	SW	1600	69	C-OCC	
4LED	Hallway	Hallways	9	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.65	SW	8736	5,661	C-OCC	
6LED	Secretarial Area	Offices	3	T 34 R F 4 (MAG)	F44EE	144	0.43	SW	1600	691	C-OCC	
61LED	Nurse Office Room 145	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Storage Room 114	Storage Areas	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Room 143	Offices	2	T 34 R F 3 (MAG)	F43EE	115	0.23	SW	1600	368	C-OCC	
61LED	Room 138	Offices	1	T 34 R F 3 (MAG)	F43EE	115	0.12	SW	1600	184	C-OCC	
61LED	Room 139	Offices	1	T 34 R F 3 (MAG)	F43EE	115	0.12	SW	1600	184	C-OCC	
61LED	Magic Fork Café	Cafeteria	17	T 34 R F 3 (MAG)	F43EE	115	1.96	SW	1000	1,955	C-OCC	
4LED	Magic Fork Café	Cafeteria	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.43	SW	1000	432	C-OCC	
41LED	Men's Room	Restroom w/o OCC	1	1B 40 R F 2 (MAG)	F42SS	94	0.09	SW	1600	150	C-OCC	
3	Men's Room	Restroom w/o OCC	1	W 34 W F 1 (MAG)	F41EE	43	0.04	SW	1600	69	C-OCC	
41LED	Women's Room	Restroom w/o OCC	1	1B 40 R F 2 (MAG)	F42SS	94	0.09	SW	1600	150	C-OCC	
3	Women's Room	Restroom w/o OCC	1	W 34 W F 1 (MAG)	F41EE	43	0.04	SW	1600	69	C-OCC	

Energy Audit of Middlesex County Mental Health Center
CHA Project No.28344
Existing Lighting & Audit Input

Cost of Electricity: **$0.120** **$/kWh**
$12.02 **$/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
4LED	Hallway	Hallways	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.29	SW	8736	2,516	C-OCC	
6LED	Particial Care Group Room	Offices	10	T 34 R F 4 (MAG)	F44EE	144	1.44	SW	1600	2,304	C-OCC	
71	Boiler Room	Mechanical Room	4	I 60	I60/1	60	0.24	SW	8736	2,097	C-OCC	
4LED	Restroom	Restroom w/o OCC	2	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.14	SW	1600	230	C-OCC	
41LED	Pump Room	Mechanical Room	2	1B 40 R F 2 (MAG)	F42SS	94	0.19	SW	8736	1,642	C-OCC	
61LED	Men's Room	Restroom w/o OCC	1	T 34 R F 3 (MAG)	F43EE	115	0.12	SW	1600	184	C-OCC	
3	Men's Room	Restroom w/o OCC	1	W 34 W F 1 (MAG)	F41EE	43	0.04	SW	1600	69	C-OCC	
61LED	Women's Room	Restroom w/o OCC	1	T 34 R F 3 (MAG)	F43EE	115	0.12	SW	1600	184	C-OCC	
3	Women's Room	Restroom w/o OCC	1	W 34 W F 1 (MAG)	F41EE	43	0.04	SW	1600	69	C-OCC	
61LED	Auditorium	Auditorium	15	T 34 R F 3 (MAG)	F43EE	115	1.73	SW	1300	2,243	C-OCC	
4LED	Auditorium	Auditorium	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.43	SW	1300	562	C-OCC	
71	Auditorium	Auditorium	3	I 60	I60/1	60	0.18	SW	1300	234	C-OCC	
61LED	Auditorium Storage	Auditorium	3	T 34 R F 3 (MAG)	F43EE	115	0.35	SW	1300	449	C-OCC	
9LED	Outdoor Lighting	Outdoor Lighting	16	High Bay MH 200 35 Feet High	MH200/1	232	3.71	Breaker	4368	16,214	NONE	
	Total		**475**				**53.85**			**147,461**		

APPENDIX C

ECM Calculations

Middlesex County LGEA
CHA Project Numer: 28344

Rate of Discount (used for NPV) 3.0%

	Utility Costs		Yearly Usage	Metric Ton Carbon Dioxide Equivalent	Building Area	Annual Utility Cost		
	$ 0.187	$/kWh blended		0.000420205	40,000	Electric	Natural Gas	Fuel Oil
	$ 0.120	$/kWh supply	480,000	0.000420205		$ 89,767	$ 14,746	
	$ 12.02	$/kW	213.8	0				
	$ 0.98	$/Therm	15,008	0.00533471				
Estimated	$ 7.50	$/kgals		0				
		$/Gal						

Middlesex County Mental Health 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
N	ECM-1	Window Replacement	0.0	105	135	0	0	152	$ 22,200	145.7	30	0.8	$ -	N	145.7	0.0	3,165	4,060	0	$ 4,571	(0.8)	($19,214)	-8.2%
N	ECM-2A	Replace Existing HVAC System Option A- in kind	10.3	43,651	2,224	0	0	22,650	$ 1,193,948	52.7	20	30.2	$ 9,964	N	52.3	206.4	873,025	44,475	0	$ 236,606	(0.8)	($847,009)	-7.8%
Y	ECM-2B	Replace Existing HVAC System Option B VRV	0.0	(15,399)	12,757	0	0	23,367	$ 1,519,028	65.0	20	61.6	$ 8,640	N	64.6	0.0	(307,985)	255,136	0	$ 192,440	(0.9)	($1,162,746)	-9.3%
Y	ECM-3	Replace Electric DHW Heater with a Gas Fired Condensing DHW	6.0	4,808	(150)	0	0	1,295	$ 31,341	24.2	20	1.2		N	24.2	120.0	96,162	(3,004)	0	$ 32,348	0.0	($12,071)	-1.7%
N	ECM-4	Install Low Flow Plumbing Fixtures	0.0	0	453	0	46	787	$ 108,270	137.5	25	2.4		N	137.5	0.0	0	11,316	1,146	$ 19,684	(0.8)	($94,559)	-10.3%
N	ECM-L1	Lighting Replacements / Upgrades	33.1	89,522	0	0	0	15,520	$ 116,449	7.5	10	37.6	$ 2,400	N	7.3	331.2	895,223	0	0	$ 215,182	0.8	$18,342	6.0%
N	ECM-L2	Install Lighting Controls (Add Occupancy Sensors)	0.0	20,129	0	0	0	2,415	$ 41,310	17.1	10	8.5	$ 5,355	N	14.9	0.0	201,289	0	0	$ 37,641	(0.1)	($15,351)	-6.6%
Y	ECM-L3	Lighting Replacements with Controls (Occupancy Sensors)	33.1	97,373	0	0	0	16,462	$ 157,759	9.6	10	40.9	$ 7,755	N	9.1	331.2	973,727	0	0	$ 229,862	0.5	($9,578)	1.7%
		Total (Does Not Include ECM-L1 & ECM-L2)	**49.4**	**130,538**	**15,418**	**0**	**46**	**$ 64,714**	**$ 3,032,546**	**46.9**	**20.8**	**137**	**$ 26,359**		**46.45328875**	**658**	**1,638,094**	**311,983**	**1,146**	**$ 715,511**	**(0.8)**	**-2043403.15**	**-7.0%**
		Recommended Measures (highlighted green above)	**39.1**	**86,782**	**12,607**	**0**	**0**	**$ 41,124**	**$ 1,708,128**	**41.5**	**16.7**	**104**	**$ 16,395**	**0**	**41.13689849**	**451**	**761,904**	**252,132**	**-**	**$ 454,650**	**(0.7)**	**-1175164.512**	**-9.4%**
		% of Existing	**18%**	**18%**	**84%**	**0**	**0**																

	City:	Newark, NJ				
	Occupied Hours/Week	48				
		Building Operating	Auditorium Occupied	Gymnasium Occupied	Library Occupied	Classrooms Occupied
Temp	Enthalpy h (Btu/lb)	Bin Hours	Hours	Hours	Hours	Hours	Hours
102.5							
97.5	35.4	6	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

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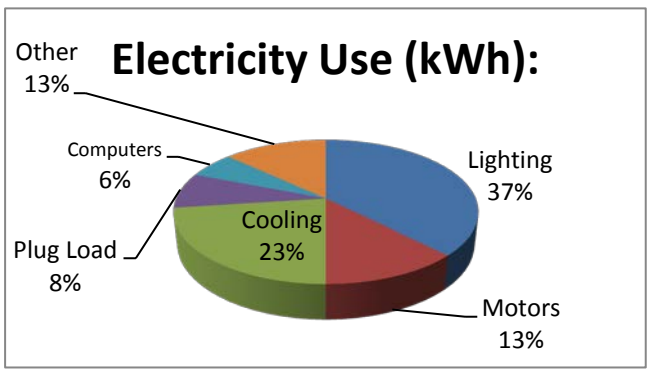
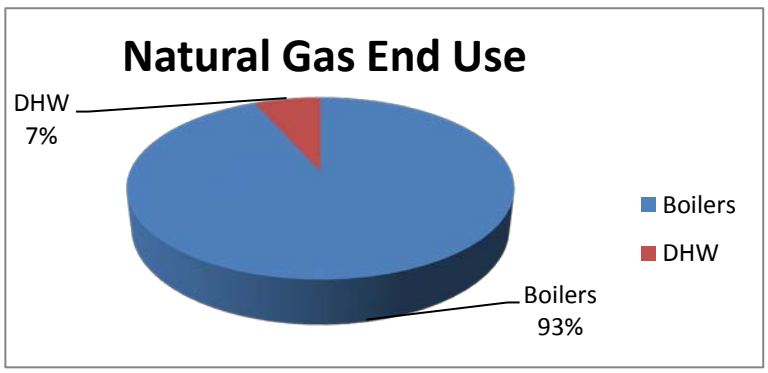
Utility End Use Analysis			
Electricity Use (kWh):		**Notes/Comments:**	
480,000	Total	Based on utility analysis	
180,000	Lighting	From Lighting Calculations	38%
60,000	Motors	Estimated	13%
110,000	Cooling	Estimated	23%
38,400	Plug Load	Estimated	8%
28,500	Computers	Estimated	6%
63,100	Other	Remaining	13%
Natural Gas Use (Therms):		**Notes/Comments:**	
15,008	Total	Based on utility analysis	
14,008	Boilers	Therms/SF x Square Feet Served	93%
1,000	DHW	Based on utility analysis	7%





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

ECM-1 Window Replacement

Existing: The South Wing windows are single pane windows. This can lead to increased energy consumption due to infiltration/exfiltration and heat gain/loss.
Proposed: Install weather strip or caulking to properly seal windows

Linear Feet of window Edge	240.0 LF	Cooling System Efficiency	1.2 kW/ton	Heating System Efficiency	80%			
Area of window glass	160.0 SF	Ex Occupied Clng Temp.	72 *F	Heating On Temp.	60 *F			
Existing Infiltration Factor	**0.20 cfm/LF**	Ex Unoccupied Clng Temp.	72 *F	Ex Occupied Htg Temp.	72 *F			
Proposed Infiltration Factor	**0.10 cfm/LF**	Cooling Occ Enthalpy Setpoint	27.5 Btu/lb	Ex Unoccupied Htg Temp.	72 *F			
Existing U Value	**1.13 Btuh/SF/°F**	Cooling Unocc Enthalpy Setpoint	27.5 Btu/lb	Electricity	$ 0.187 $/kWh			
Proposed U Value	**0.60 Btuh/SF/°F**			Natural Gas	$ 0.98 $/therm			

					EXISTING LOADS		PROPOSED LOADS		COOLING ENERGY		HEATING ENERGY	
					Occupied	Unoccupied	Occupied	Unoccupied				
Avg Outdoor Air Temp. Bins °F	Avg Outdoor Air Enthalpy	Existing Equipment Bin Hours	Occupied Equipment Bin Hours	Unoccupied Equipment Bin Hours	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Window Infiltration & Heat Load BTUH	Existing Cooling Energy kWh	Proposed Cooling Energy kWh	Existing Heating Energy Therms	Proposed Heating Energy Therms
A		B	C	D	E	F	G	H	I	J	K	L
102.5	50.1	0	0	0	-8,786	-8,786	-5,369	-5,369	0	0	0	0
97.5	42.5	6	2	4	-6,504	-6,504	-4,068	-4,068	4	2	0	0
92.5	39.5	45	16	29	-5,216	-5,216	-3,264	-3,264	23	15	0	0
87.5	36.6	146	52	94	-3,950	-3,950	-2,471	-2,471	58	36	0	0
82.5	34.0	298	106	192	-2,748	-2,748	-1,710	-1,710	82	51	0	0
77.5	31.6	476	170	306	-1,590	-1,590	-971	-971	76	46	0	0
72.5	29.2	662	237	426	-431	-431	-232	-232	29	15	0	0
67.5	27.0	740	264	476	0	0	0	0	0	0	0	0
62.5	24.5	765	273	492	0	0	0	0	0	0	0	0
57.5	21.4	733	262	471	2,608	2,608	1,768	1,768	0	0	24	16
52.5	18.7	668	239	430	3,507	3,507	2,377	2,377	0	0	29	20
47.5	16.2	659	235	424	4,406	4,406	2,987	2,987	0	0	36	25
42.5	14.4	685	245	441	5,305	5,305	3,597	3,597	0	0	45	31
37.5	12.6	739	264	475	6,204	6,204	4,206	4,206	0	0	57	39
32.5	10.7	717	256	461	7,104	7,104	4,816	4,816	0	0	64	43
27.5	8.6	543	194	349	8,003	8,003	5,425	5,425	0	0	54	37
22.5	6.8	318	114	205	8,902	8,902	6,035	6,035	0	0	35	24
17.5	5.5	245	88	158	9,801	9,801	6,645	6,645	0	0	30	20
12.5	4.1	156	56	100	10,700	10,700	7,254	7,254	0	0	21	14
7.5	2.6	92	33	59	11,600	11,600	7,864	7,864	0	0	13	9
2.5	1.0	36	13	23	12,499	12,499	8,473	8,473	0	0	6	4
-2.5	0.0	19	7	12	13,398	13,398	9,083	9,083	0	0	3	2
-7.5	-1.5	8	3	5	14,297	14,297	9,693	9,693	0	0	1	1
TOTALS		**8,760**	**3,129**	**5,631**					271	166	**420**	**285**

Existing Window Infiltration	**48**	**cfm**	
Existing Window Heat Transfer	**128**	**Btuh/°F**	
Proposed Window Infiltration	**24**	**cfm**	
Proposed Window Heat Transfer	**96**	**Btuh/°F**	

Savings	**135**	**Therms**	**$**	**133**
	105	**kWh**	**$**	**20**
			$	**152**

Window ID	Location	Quantity	Width (ft)	Height (ft)	Linear Feet (LF)	Area (SF)	Infiltration Rate (CFM/LF)	U Value (Btuh/SF/°F)	Infiltration (CFM)	Heat Transfer (Btuh/°F)
1	South Wing	20	2	4	240.0	160.0	0.2	0.8	48.0	128.0
Total		**20**	**2**	**4**	**240.0**	**160.0**	**0.20**	**0.80**	**48.0**	**128.0**

Multipliers	
Material:	1.10
Labor:	1.35
Equipment:	1.10

ECM-1 Window Replacement - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
Window Replacement	160	sqft	$ 65	$ 40	$ -	$ 10,400	$ 6,400	$ -	$ 16,800	Vendor Est per SF

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

$ 16,800	Subtotal
$ 1,680	10% Contingency
$ 3,696	20% Contractor O&P
$ -	0% Engineering Fees
$ 22,200	**Total**

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ECM-2A (1) Replace Boilers with Condensing Boilers

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

Item	Value	Units	Formula/Comments
Baseline Fuel Cost	$ 0.98	/ Therm	Natural Gas
Baseline Fuel Cost		/ Gal	No. 2 Oil
FORMULA CONSTANTS			
Oversize Factor	0.8		
Hours per Day	24		
Infrared Conversion Factor	1.0		1.0 if Boiler, 0.8 if Infrared Heater
EXISTING			
Capacity	1,315,000	btu/hr	Total Capacity of Five Boilers throughout the Building
Heating Combustion Efficiency	80%		Estimated averaged Efficiency
Heating Degree-Day	2,651	Degree-day	
Design Temperature Difference	56	F	
Fuel Conversion	100,000	btu/therm	
PROPOSED			
Capacity	1,315,000	btu/hr	
Efficiency	90%		
SAVINGS			
Fuel Savings	1,660	therms	NJ Protocols Calculation
Fuel Cost Savings	$ 1,627		

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

Total Savings of ECM-2A

Electric Savings	**43,651**	**kWh**
Demand Savings	**10**	**kW**
Natural Gas Savings	**2,224**	**therms**

Algorithms

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

Definition of Variables

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

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

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

HDD_{mod} = HDD by zone and building type

24 = Hours/Day

ΔT = design temperature difference

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

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

EFF_B = Efficiency of baseline heaters (AFUE %)

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

Furnaces and Boilers

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

Sources:

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

Adjusted Heating Degree Days by Building Type

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

Heating Degree Days and Outdoor Design Temperature by Zone

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

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ECM-2A (2) Replace DX Units with High Efficient Units
(utilize remote outdoor condensers)

ASSUMPTIONS			Comments
Electric Cost	$0.187	/ kWh	
Average run hours per Week	80	Hours	Unit is manually turned on , runs at night
Space Balance Point	55	F	
Space Temperature Setpoint	72	deg F	setpoint
BTU / Hr Rating of existing AC units	690,000	Btu / Hr	Total BTU/H of DX units
Average EER	11.0		Estimated

Item	Value	Units	Comments
Total Number of Units	1		
Existing Annual Electric Usage	120,361	kWh	
Proposed EER	12.5		New DX units
Proposed Annual Electric Usage	105,918	kWh	Unit will cycle on w/ temp of room. Possible operating time shown below

ANNUAL SAVINGS		
Annual Savings	14,443	kWh
Annual Cost Savings	$2,701	

OAT - DB Bin Temp F	Annual Hours	Cooling Hrs at Temp Above balance point	Assumed % of time of operation	Assumed hrs of Operation
102.5	0	0	100%	0
97.5	35	6	100%	6
92.5	37	31	100%	31
87.5	35	131	100%	131
82.5	33	500	100%	500
77.5	32	620	100%	620
72.5	30	664	95%	631
67.5	27	854	0%	0
62.5	24	927	0%	0
57.5	20	600	0%	0
52.5	18	730	0%	0
47.5	16	491	0%	0
42.5	15	656	0%	0
37.5	13	1023	0%	0
32.5	10	734	0%	0
27.5	9	334	0%	0
22.5	7	252	0%	0
17.5	5	125	0%	0
12.5	4	47	0%	0
7.5	2	34	0%	0
2.5	1	1	0%	0
-2.5	0	0	0%	0
-7.5	0	0	0%	0

Total	374	8,760	100%	1919

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ECM-2A (3) Replace Chiller with High Efficient Chiller

Description: This ECM evaluates the electrical energy savings associated with replacing older, less efficient air cooled chiller with high efficiency air cooled chiller.

Item	Value	Units	Formula/Comments
Demand Unit Cost	$ 12.02	/ kW	
Consumption Rate	$ 0.12	/ kWh	
FORMULA CONSTANTS			
Peak Duty Cycle	67%		NJ Protocols
Equivalent full Load Hours	947	hrs	NJ Protocols
Capacity of Chillers	44	tons	
PART-LOAD OPERATION			
Baseline IPLV	1.02	kW/ton	
Proposed IPLV	0.80	kW/ton	
Demand Savings	6.5	kW	
Energy Savings	9,167	kWh	
FULL LOAD OPERATION			
Baseline FLV	1.05	kW/ton	
Proposed FLV	0.92	kW/ton	
Demand Savings	3.8	kW	
Energy Savings	5,417	kWh	
ENERGY SAVINGS			
Demand Savings	10	kW	
Energy Savings	14,584	kWh	
Cost Savings	$ 3,238		

Savings calculation formulas are taken from NJ Protocols document for Electric Chiller

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ECM-2A (4) Install a DDC System

Description: This ECM evaluates the energy savings associated with implementing a full wireless direct digital control system that enable remote automatic control, monitoiring and alarming of all HVAC equipment. Specific energy savings sequences would include optium Start/ Stop, night setback, temporary occupied set back, economizer control of UVs and AHU's. This energy savings percentage is based on past performance of similar buildings which have a fully functioning DDC control system.

Building Information:

40,000	Sq Footage	$0.19	$/kWh Blended
Y	Cooling	$0.98	$/Therm
Y	Heating		

FULL DDC - TEMPERATURE SETBACK SAVINGS CALCULATION

EXISTING CONDITIONS		
Heating		
Heating Season Facility Temp	72	F
Weekly Occupied Hours	48	hrs
Heating Season Setback Temp	67	F
Heating Season % Savings per Degree Setback	3%	
Annual Boiler Capacity	1,315	Mbtu/yr
Connected Heating Load Capacity	1,315,000	Btu/hr
Equivalent Full Load Heating Hours	50	hrs
Heating System Efficiency	80%	
Cooling		
Cooling Season Facility Temp	72	F
Weekly Occupied Hours	48	hrs
Cooling Season Setback Temp	77	F
Cooling Season % Savings per Degree Setback	3%	
Connected Cooling Load Capacity	102	Tons
Equivalent Full Load Cooling Hours	50	hrs
Cooling Equipment EER	10.0	
SAVINGS		
Natural Gas Savings	84	Therms
Cooling Electricity Savings	7,674	kWh

FULL DDC - ADDITIONAL CONTROLS SAVINGS CALCULATION

EXISTING CONDITIONS		
Existing Facility Total Electric usage	480,000	kWh
Existing Facility Total Gas usage	15,008	Therms
Existing Facility Cooling Electric usage	110,000.0	kWh[1]
Existing Facility Heating Natural Gas usage	14,008	Therms[2]
PROPOSED CONDITIONS		
Proposed Facility Cooling Electric Savings	3,300	kWh
Proposed Facility Natural Gas Savings	420	Therms
SAVINGS		
Electric Savings	3,300	**kWh**
Natural Gas Savings	420	**Therms**

Assumptions

1	23%	of facility total electricity dedicated to Cooling; based on utility information
2	93%	of facility total natural gas dedicated to Heating; based on utility information
3	3%	Typical Savings associated with installation of DDC controls

Nighttime Setback

EXISTING CONDITIONS		
Heating		
Heating Season Facility Temp	72	F
Weekly Occupied Hours	48	hrs
Heating Season Setback Temp	65	F
Heating Season % Savings per Degree Setback	3%	
Annual Boiler Capacity	1,315	Mbtu/yr
Connected Heating Load Capacity	1,315,000	Btu/hr
Equivalent Full Load Heating Hours	25	hrs
Heating Equipment Efficiency	80%	
Cooling		
Cooling Season Facility Temp	72	F
Weekly Occupied Hours	48	hrs
Cooling Season Setback Temp	80	F
Cooling Season % Savings per Degree Setback	3%	
Connected Cooling Load Capacity	102	Tons
Equivalent Full Load Cooling Hours	25	hrs
Cooling Equipment EER	10.0	
SAVINGS		
Natural Gas Savings	59	Therms[3]
Cooling Electricity Savings	3,650	kWh

COMBINED SAVINGS		
Natural Gas Savings	564	Therms
Cooling Electricity Savings	14,624	kWh
Total Cost Savings	$ 3,287	
Estimated Total Project Cost	$ 98,582	
Simple Payback	30.0	Yrs

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

Savings calculations for additional controls are estimated based on the level of control to be added and prior experience

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Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-2A Replace Existing HVAC System Option A- in kind - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
1,000 MBH NG Condensing Boiler	2	EA	$ 20,000	$ 10,000		$ 41,080	$ 24,920	$ -	$ 66,000	Vendor Estimate
Flue Installation	2	LS	$ 2,500	$ 2,500		$ 5,135	$ 6,230	$ -	$ 11,365	Vendor Estimate
Controls	2	EA	$ 500	$ 1,500		$ 1,027	$ 3,738	$ -	$ 4,765	Vendor Estimate
Miscellaneous Electrical	2	LS	$ 1,000	$ 2,500		$ 2,054	$ 6,230	$ -	$ 8,284	Estimated
Boiler piping (HHW and Gas)	2	EA	$ 5,000	$ 5,000		$ 10,270	$ 12,460	$ -	$ 22,730	Estimated
Pumps	2	EA	$ 3,500	$ 1,500		$ 7,189	$ 3,738	$ -	$ 10,927	Estimated
North Wing Fan Coil Units	45	EA	$2,500	$ 2,500		$ 115,538	$ 140,175	$ -	$ 255,713	Estimated
North Wing HHW Pipes Supply/Return	45	EA	$500	$ 500		$ 23,108	$ 28,035	$ -	$ 51,143	Estimated
North Wing CHW Pipes Supply/Return	45	EA	$500	$ 500		$ 23,108	$ 28,035	$ -	$ 51,143	Estimated
45 Ton Chiller	1	EA	$ 35,300	$ 15,000	$ -	$ 36,253	$ 18,690	$ -	$ 54,943	RS Means 2012
Miscellaneous CHW piping	1	EA	$ 2,500	$ 5,000		$ 2,568	$ 6,230	$ -	$ 8,798	Estimated
20 Ton DX	1	EA	$ 7,500	$ 2,500	$ -	$ 7,703	$ 3,115	$ -	$ 10,818	RS Means 2012
38 Ton DX	1	EA	$ 10,000	$ 3,500	$ -	$ 10,270	$ 4,361	$ -	$ 14,631	RS Means 2012
Ref Piping & Misc ref specialties	1	EA	$ 15,000	$ 15,000		$ 15,405	$ 18,690	$ -	$ 34,095	Estimated
PTAC units	15	EA	$ 1,500	$ 500		$ 23,108	$ 9,345	$ -	$ 32,453	RS Means 2012
VAV boxes	29	EA	$ 1,500	$ 1,500		$ 44,675	$ 54,201	$ -	$ 98,876	RS Means 2012
Valves for heating coils	68	EA	$ 261	$ 18		$ 18,227	$ 1,512	$ -	$ 19,740	RS Means 2012
Valves for Cooling Coils	68	EA	$ 261	$ 18		$ 18,227	$ 1,512	$ -	$ 19,740	RS Means 2012
Head End Controller & Programming	1	LS	$ 15,000	$ 15,000		$ 15,405	$ 18,690	$ -	$ 34,095	Estimated
DDC valves	100	EA	$ 250	$ 250		$ 25,675	$ 31,150	$ -	$ 56,825	Estimated
DDC dampers/ actuators	25	EA	$ 550	$ 250		$ 14,121	$ 7,788	$ -	$ 21,909	Estimated
DDC wiring	1	LS	$ 25,000	$ 25,000		$ 25,675	$ 31,150	$ -	$ 56,825	Estimated
TAB	1	LS	$ -	$ 5,000		$ -	$ 6,230	$ -	$ 6,230	Estimated
Start up	1	LS	$ -	$ 2,500		$ -	$ 3,115	$ -	$ 3,115	Estimated
						$ -	$ -	$ -	$ -	

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

$ 955,159	Subtotal
$ 238,790	25% Contingency
$ 1,193,948	**Total**

Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health Center

ECM-2B Replace Existing HVAC System Option B VRV

Description: This ECM evaluates the energy energy savings associated with replacing older, less efficient HVAC systems with a modern high efficiency VRV system.

Item	Value	Units	Formula/Comments
Baseline Utility Cost	$ 0.19	/ kWh	Blended Electricity Rate
	$ 0.98	/ Therm	Natural Gas Rate
Existing HVAC Energy Consumption			
Cooling Usage	110,000	kWh	Estimated from Utility Data
Heating Usage	12,757	Therm	Estimated from Utility Data (85% Gas Savings)
Proposed VRV Energy Consumption			
VRV Electric Usage	125,399	kWh	From Daikin Online Calculator
VRV Gas Usage	-	Therm	From Daikin Online Calculator
Energy Savings			
Electricity Savings	(15,399)	kWh	
Natural Gas Savings	12,757	Therm	
Cost Savings			
Electricity Cost Savings	$ (2,880)	$/yr	
Natural Gas Cost Savings	$ 12,502	$/yr	
Total Cost Savings	$ 9,622	$/yr	

VRV System Energy Calculation Tool

Project Name : Middlesex Mental Health Center
Address : 577 Lee Street, Perth Amboy NJ 08861

5/6/2014
Middlesex County

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Ver.1.00	June 24, 2005
Ver.1.01	July 11, 2005
Ver.1.02	July 19, 2005
Ver.1.03	September 1, 2005
Ver.2.0B3	March 20, 2006
Ver.2.1	March 6, 2007
Ver.2.2	May 23, 2007
Ver.2.3	June 18, 2007
Ver.2.4	July 4, 2007
Ver.2.5	November 14, 2007
Ver.2.6	March 4, 2009
Ver.2.7	April 18, 2011
Ver.2.8	March 20, 2014

VRV System Energy Calculation Tool

Project					
Project Name			Middlesex Mental Health Center		
Address			577 Lee Street, Perth Amboy NJ 08861		
Company			Middlesex County		
Date			5/6/2014		
Design Conditions					
Country / State			NJ		
City			Newark		
Indoor Temperature	Cooling		72.0	[FDB]	
	Heating		72.0	[FDB]	
Outdoor Temperature	Cooling		93.0	[FDB]	Unique to City
	Heating		9.9	[FDB]	Unique to City
Building Load	Cooling		1112.0	[MBH]	Ref. Selected System Capacity 1008 [MBH]
	Heating		935.0	[MBH]	Ref. Selected System Capacity 1134 [MBH]
Conditioned Area			40000.0	[sqft]	
Operating Conditions					
Operation Period	Cooling	From	4	Apr.	
		To	9	Sep.	
	Heating	From	9	Sep.	
		To	4	Apr.	
Operation Days per Week			5	[Days/Week]	
Operation Time		From	8:00am		
		To	9:00pm		
Outdoor Temperature Limit of Operation		Cooling	40.0	[FDB]	
		Heating	60.0	[FDB]	
Cost Information					
Electricity			0.19	[Dollars/kWh]	

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5/6/2014
Project Name:Middlesex Mental Health Center

< VRV system >

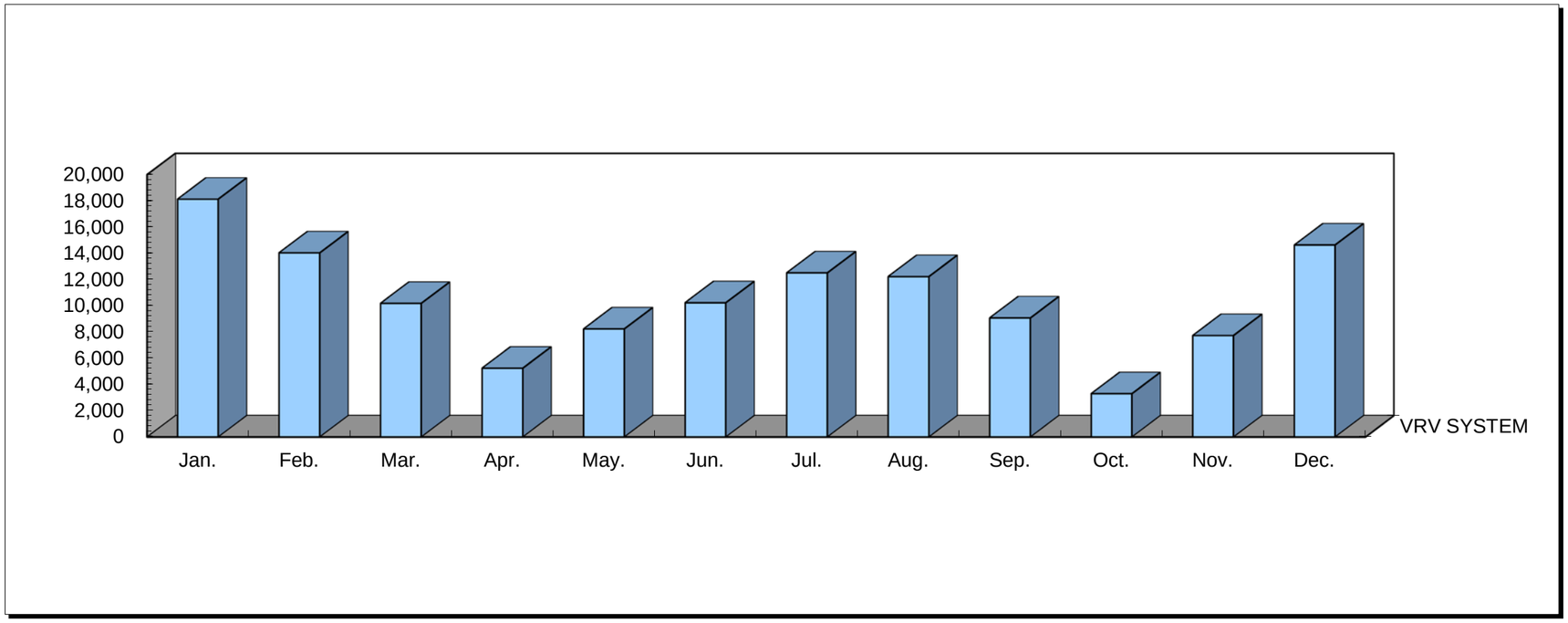
Outdoor Unit							
Type	Model	USRT	Cooling Specifications		Heating Specifications		No.of
			Capacity[MBH]	Power Input[kW]	Capacity[MBH]	Power Input[kW]	Units
VRV III HEAT RECOVERY 230V	REYQ336PBTJ	28	336.0	29.60	378.0	30.50	3
Total		84	1008.0	88.80	1134.0	91.50	3

Indoor Unit							
Refrigerant	Type	Model	Cooling Specifications		Heating Specifications		No.of
			Capacity[MBH]	Power Input[kW]	Capacity[MBH]	Power Input[kW]	Units
R410A	DC Ducted Concealed Ceiling Unit	FXMQ12PA	12.0	0.06	13.5	0.05	31
R410A	DC Ducted Concealed Ceiling Unit	FXMQ18PA	18.0	0.12	20.0	0.11	22
R410A	DC Ducted Concealed Ceiling Unit	FXMQ24PA	24.0	0.13	27.0	0.12	14
Total			1104.0	6.57	1236.5	5.82	67

5/6/2014
Project Name:Middlesex Mental Health Center

VRV SYSTEM

		Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Sum.
LOAD [MBH]		154,767	119,692	87,975	78,649	157,829	201,689	235,333	237,661	184,079	15,340	65,391	124,208	1,662,613
POWER CONSUMPTION [kWh]	Outdoor Unit	16,445	12,510	8,495	3,405	6,333	8,390	10,605	10,323	7,231	1,616	6,099	12,948	104,399
	Indoor Unit(Fan)	1,676	1,514	1,676	1,829	1,890	1,829	1,890	1,890	1,829	1,676	1,622	1,676	21,000
	Ventilation fan	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	18,122	14,025	10,172	5,234	8,223	10,219	12,495	12,213	9,060	3,293	7,721	14,624	125,399



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Part Load Characteristics < VRV System - Cooling>

Building Load			Occurrence		Total		Outdoor Temp.	Outdoor Unit	Indoor Unit	Venti -lation	System	Range of Load
								PI	PI	PI	PI	
[%]	[USRT]	[MBH]	[%]	[h]	[USRT-h]	[MBH-h]	[degF]	[kWh]	[kWh]	[kWh]	[kWh]	
100%	93	1,112	1.6%	26.4	2,435.4	29,224.3	93.0	1,733	174	0	1,906	95%<=Load
90%	83	1,001	5.5%	93.6	7,752.3	93,027.9	87.7	4,806	614	0	5,421	85%<=Load<95%
80%	74	890	19.0%	323.6	23,845.4	286,144.3	82.4	12,977	2,125	0	15,102	75%<=Load<85%
70%	65	778	17.2%	291.4	18,867.4	226,409.2	77.1	9,076	1,914	0	10,989	65%<=Load<75%
60%	56	667	15.6%	265.0	14,877.8	178,533.8	71.8	6,739	1,740	0	8,479	55%<=Load<65%
50%	46	556	16.9%	286.4	13,269.5	159,234.5	66.5	5,899	1,881	0	7,779	45%<=Load<55%
40%	37	445	7.6%	128.6	4,842.4	58,108.4	61.2	2,166	844	0	3,010	35%<=Load<45%
30%	28	334	6.5%	110.7	3,084.3	37,011.0	55.9	1,462	727	0	2,189	25%<=Load<35%
20%	19	222	5.5%	93.6	1,820.4	21,844.4	50.6	987	614	0	1,602	15%<=Load<25%
10%	9	111	4.7%	80.0	475.2	5,702.7	45.3	440	525	0	966	Load<15%
Totals			100.0%	1,699.3	91,270.0	1,095,240.6	-	46,285	11,158	0	57,443	-
Yearly Cost at			0.19	[Dollars/kWh]				$8,655	$2,086	$0	$10,742	-

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Part Load Characteristics < VRV System - Heating>

Building Load		Occurrence		Total	Outdoor Temp.	Outdoor Unit	Indoor Unit	Venti -lation	System	Range of Load
						PI	PI	PI	PI	
[%]	[MBH]	[%]	[h]	[MBH-h]	[degF]	[kWh]	[kWh]	[kWh]	[kWh]	
100%	935	0.8%	12.9	12,609.3	9.9	1,280	75	0	1,355	95%<=Load
90%	842	1.0%	16.4	13,700.5	14.9	1,699	96	0	1,795	85%<=Load<95%
80%	748	2.9%	48.6	35,672.6	19.9	4,094	283	0	4,377	75%<=Load<85%
70%	655	4.9%	82.9	53,588.8	24.9	5,986	483	0	6,468	65%<=Load<75%
60%	561	11.2%	189.3	105,191.6	29.9	11,719	1,102	0	12,822	55%<=Load<65%
50%	468	18.9%	319.3	148,627.4	35.0	15,386	1,860	0	17,246	45%<=Load<55%
40%	374	15.8%	267.1	100,653.1	40.0	9,234	1,556	0	10,790	35%<=Load<45%
30%	281	10.4%	175.7	49,683.0	45.0	4,014	1,023	0	5,037	25%<=Load<35%
20%	187	9.9%	167.9	31,341.0	50.0	2,671	978	0	3,649	15%<=Load<25%
10%	94	24.3%	410.0	16,304.8	55.0	2,030	2,388	0	4,418	Load<15%
Totals		100.0%	1,690.0	567,372.2	-	58,114	9,843	0	67,956	-
Yearly Cost at		0.19	[Dollars/kWh]			$10,867	$1,841	$0	$12,708	-

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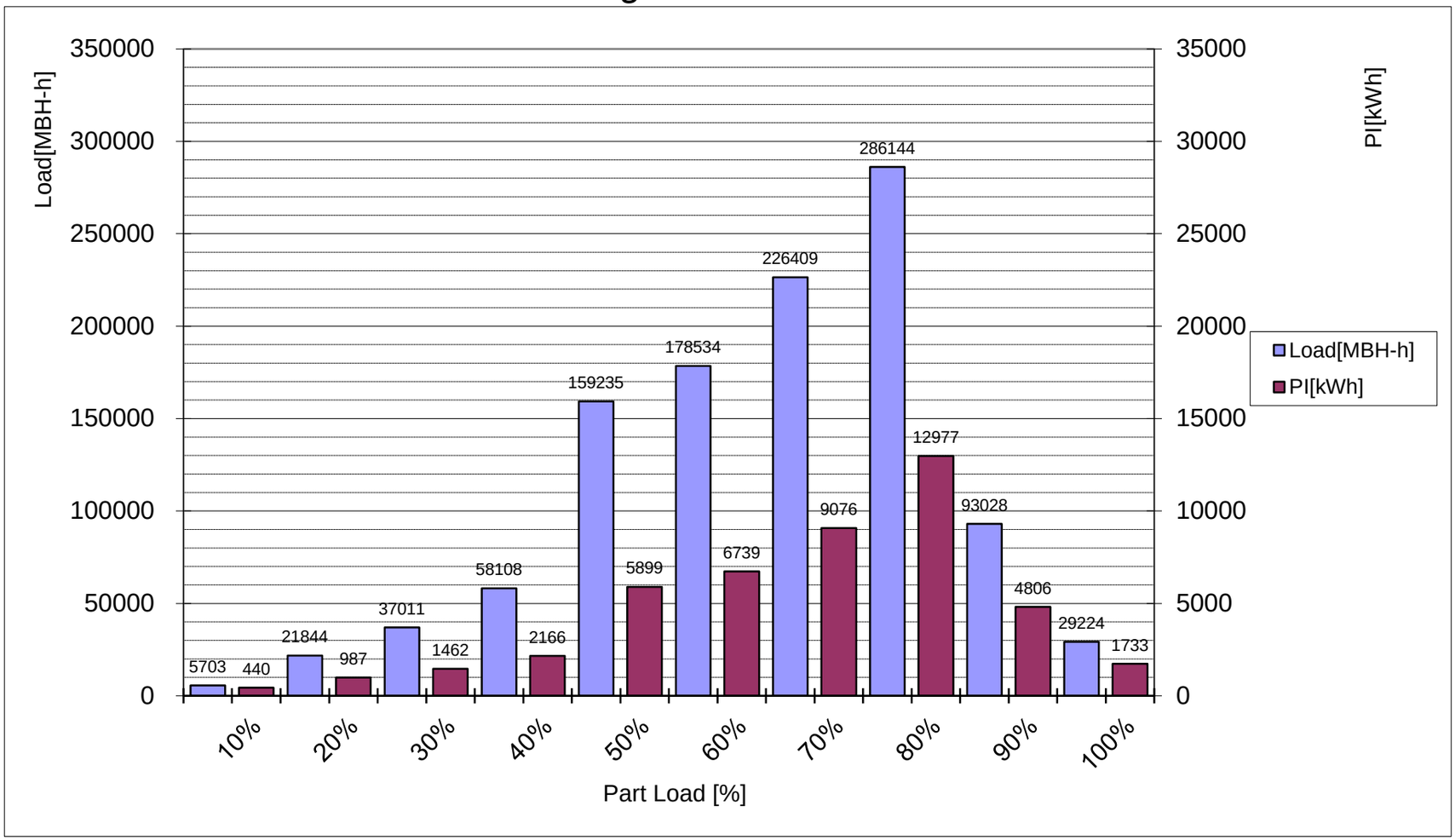
5/6/2014
Project Name:Middlesex Mental Health Center

Part Load Characteristics < Cooling >



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Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health Center

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.00

ECM-2B Replace Existing HVAC System Option B VRV - Cost

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
						$ -	$ -	$ -	$ -	
General conditions	1	ls		$ 30,000						
Demolition	1	ls		$ 10,000						
Outdoor Units	3	ea	$ 15,000	$ 5,000		$ 46,215	$ 18,690	$ -	$ 64,905	Vendor Quote*
Indoor Units	121	ea	$ 4,000	$ 500		$ 497,068	$ 75,383	$ -	$ 572,451	Vendor Quote
Refrigerant Piping	1	ea	$ 75,000	$ 35,000		$ 77,025	$ 43,610	$ -	$ 120,635	Vendor Quote
Controls	1	ea	$ 10,000	$ 5,000		$ 10,270	$ 6,230		$ 16,500	Estimated
Energy recovery Ventilator	3	ea	$ 25,000	$ 6,000		$ 77,025	$ 22,428		$ 99,453	Estimated
Ductwork	3	ea	$ 7,500	$ 17,000		$ 23,108	$ 63,546		$ 86,654	Estimated
Start up, TAB	1	ls		$ 10,000		$ -	$ 12,460		$ 12,460	Estimated
General construction	1	ls	$ 5,000	$ 30,000		$ 5,135	$ 37,380		$ 42,515	Estimated
Wiring	121	ea	$ 1,000	$ 500		$ 124,267	$ 75,383		$ 199,650	Estimated
						$ -	$ -	$ -	$ -	

$ 1,215,223	Subtotal
$ 303,806	25% Contingency
$ 1,519,028	**Total**

**Cost Estimates are for Energy Savings calculations only, do not use for procurement
***regular work hours are included in the cost , no premium time costs are included

Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health Center

ECM-3 Replace Electric DHW Heater with a Gas Fired Condensing DHW Heater

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

Item	Value	Units	Formula/Comments
Occupied days per week	5	days/wk	
Occupied weeks per year	52	week/yr	
Water supply Temperature	55	˚F	Termperature of water coming into building
Hot Water Temperature	120	˚F	
Hot Water Usage per day	40	gal/day	Calculated from usage below
Annual Hot Water Energy Demand	5,657	MBTU/yr	Energy required to heat annual quantity of hot water to setpoint
Existing Tank Size	119	Gallons	Per manufacturer nameplate
Hot Water Temperature	120	˚F	Per building personnel
Average Room Temperature	72	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	1.2	MBH	
Annual Standby Hot Water Load	10,424	MBTU/yr	
Total Annual Hot Water Demand (w/ standby losses)	16,082	Mbtu/yr	Building demand plus standby losses
Existing Water Heater Efficiency	98%		Per Manufacturer
Total Annual Energy Required	16,410	Mbtu/yr	
Total Annual Electric Required	**4,808**	**kWh/yr**	**Electrical Savings**
Average Annual Electric Demand	0.55	kW	
Peak Electric Demand	**6.00**	**kW**	**Per Manufacturer's Nameplate (Demand Savings)**
New Tank Size	100	Gallons	
Hot Water Temperature	120	˚F	
Average Room Temperature	72	˚F	
Standby Losses (% by Volume)	2.5%		(2.5% of stored capacity per hour, per U.S. Department of Energy)
Standby Losses (Heat Loss)	1.0	MBH	
Annual Standby Hot Water Load	8,760	MBTU/yr	
Prop Annual Hot Water Demand (w/ standby losses)	14,417	MBTU/yr	
Proposed Avg. Hot water heater efficiency	96%		Based on Navien CR180 instantaneous, condensing DHW Heater
Proposed Total Annual Energy Required	15,018	MBTU/yr	
Proposed Fuel Use	150	Therms/yr	Standby Losses and inefficient DHW heater eliminated
Elec Utility Demand Unit Cost	$12.02	$/kW	
Elec Utility Supply Unit Cost	$0.12	$/kWh	
NG Utility Unit Cost	$0.98	$/Therm	
Existing Operating Cost of DHW	$1,442	$/yr	
Proposed Operating Cost of DHW	$147	$/yr	
Annual Utility Cost Savings	**$1,295**	**$/yr**	

Daily Hot Water Demand

			#USES PER DAY		FULL TIME OCCUPANTS**				
FIXTURE	*BASE WATER USE GPM	DURATION OF USE (MIN)	MALE	FEMALE	MALE	FEMALE	TOTAL GAL/DAY	% HOT WATER	TOTAL HW GAL/DAY
LAVATORY	2.5	0.25	2	2	20	20	50	50%	25
SHOWER	2.5	5	0.01	0.01	1	1	0	75%	0
KITCHEN SINK	2.5	0.5	1	1	0	0	0	75%	0
MOP SINK	2.5	2	1	1	2	2	20	75%	15
Dishwasher (gal per use)	10	1	1	0	0	0	0	100%	0
						TOTAL	70		**40**

*GPM is per standard fixtures, adjust as necessary if actual GPM is known.
**These are the occupanct that use the fixtures. If fixture does not exist change to (0).

Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health Center

ECM-3 Replace Electric DHW Heater with a Gas Fired Condensing DHW Heater - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
DHW Heater Removal	4	LS		$ 50		$ -	$ 249	$ -	$ 249	RS Means 2012
High Efficiency Gas-Fired DHW Heater	1	EA	$ 5,500	$ 1,000		$ 5,649	$ 1,246	$ -	$ 6,895	From Internet Price/ Estimated Labor Cost*
Miscellaneous Electrical	1	LS	$ 300			$ 308	$ -	$ -	$ 308	RS Means 2012
Venting Kit	1	EA	$ 450	$ 650		$ 462	$ 810	$ -	$ 1,272	RS Means 2012
Miscellaneous Piping and Valves	1	LS	$ 5,000	$ 9,000		$ 5,135	$ 11,214	$ -	$ 16,349	Estimated

* Rheem SPIDEfire

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

$ 25,073	Subtotal
$ 6,268	25% Contingency
$ 31,341	**Total**

Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health Center

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	8	
Average Flushes / Urinal (per Day)	3	
Average Gallons / Flush	1.5	Gal

PROPOSED CONDITIONS		
Proposed Urinals to be Replaced	8	
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	13.14	kGal / year
Proposed Urinal Water Use	1.10	kGal / year
Water Savings	12.05	kGal / year
Cost Savings	$90	/ year

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

Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health 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	20	
Average Flushes / Toilet (per Day)	2	
Average Gallons / Flush	3.5	Gal

PROPOSED CONDITIONS		
Proposed Toilets to be Replaced	20	
Proposed Gallons / Flush	1.28	Gal

SAVINGS		
Current Toilet Water Use	51.10	kGal / year
Proposed Toilet Water Use	18.69	kGal / year
Water Savings	32.41	kGal / year
Cost Savings	$243	/ year

Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health 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	12	
Average Uses / Faucet (per day)	2	# Uses
Average Time of Use	10.0	seconds
Average Flowrate	2.0	gpm

PROPOSED CONDITIONS		
Proposed Faucets to be Replaced	12	
Proposed Flowrate	0.5	gpm

HEATING SAVINGS		
Fuel Cost	$ 0.98	/kWh
Number of Faucets	12	
Hours per Day of Usage	0.5	hrs
Days per Year of Facility Usage	230	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	80%	
Conversion Factor	100,000	Btu/Therm
SAVINGS		
Current Faucet Water Use	1.84	kGal / year
Proposed Faucet Water Use	0.46	kGal / year
Water Savings	1.38	kGal / year
Heating Savings	453	Therms
Cost Savings	$454	/ 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

Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health Center

ECM-4 Install Low Flow Plumbing Fixtures - Cost

Multipliers	
Material:	1.03
Labor:	1.25
Equipment:	1.12

Description	QTY	UNIT	UNIT COSTS			SUBTOTAL COSTS			TOTAL COST	REMARKS
			MAT.	LABOR	EQUIP.	MAT.	LABOR	EQUIP.		
									$ -	
Low-Flow Urinal	8	EA	$ 1,200	$ 1,000	$ -	$ 9,859	$ 9,968	$ -	$ 19,827	Vendor Estimate
Low-Flow Toilet	20	EA	$ 1,400	$ 1,000	$ -	$ 28,756	$ 24,920	$ -	$ 53,676	Vendor Estimate
Low-Flow Faucet	12	EA	$ 700	$ 300	$ -	$ 8,627	$ 4,486	$ -	$ 13,112	Vendor Estimate
						$ -	$ -	$ -	$ -	

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

$ 86,616	Subtotal
$ 21,654	25% Contingency
$ 108,270	**Total**

Middlesex County LGEA
CHA Project Numer: 28344
Middlesex County Mental Health 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

- 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)	40,000
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)	$89,767	$14,746
Existing Usage (from utility)	480,000	15,008
Proposed Savings	86,782	12,607
Existing Total MMBtus	3,139	
Proposed Savings MMBtus	1,557	
% Energy Reduction	**49.6%**	
Proposed Annual Savings	$41,124	

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

	Incentives $		
	Elec	Gas	Total
Incentive #1	$0	$0	$5,000
Incentive #2	$9,546	$15,758	$25,304
Incentive #3	$9,546	$15,758	$25,304
Total All Incentives	**$19,092**	**$31,517**	**$55,608**

Total Project Cost	$1,708,128

		Allowable Incentive
% Incentives #1 of Utility Cost*	4.8%	$5,000
% Incentives #2 of Project Cost**	1.5%	$25,304
% Incentives #3 of Project Cost**	1.5%	$25,304
Total Eligible Incentives***	**$55,608**	
Project Cost w/ Incentives	$1,652,520	

Project Payback (years)	
w/o Incentives	w/ Incentives
41.5	40.2

* 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 Middlesex County Mental Health Center
CHA Project No.28344
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
7LED	North Wing Room 300	10	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.6	SW	1600	960	10	2T 46 R LED	2RTLED	25	0.3	SW	1,600	400	560	0.4	$ 117.68	$ 2,025.00	$0	17.2	17.2
18LED	North Wing Room 303	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	SW	1,600	320	397	0.2	$ 83.39	$ 945.00	$0	11.3	11.3
18LED	North Wing Room 304	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 305	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	SW	1,600	320	397	0.2	$ 83.39	$ 945.00	$0	11.3	11.3
18LED	North Wing Room 306	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	SW	1,600	320	397	0.2	$ 83.39	$ 945.00	$0	11.3	11.3
18LED	North Wing Room 307	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	SW	1,600	320	397	0.2	$ 83.39	$ 945.00	$0	11.3	11.3
18LED	North Wing Room 308	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 309	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 310	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	SW	1,600	240	298	0.2	$ 62.54	$ 708.75	$0	11.3	11.3
18LED	North Wing Room 311	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 312	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 313	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 314	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 315	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	SW	1,600	320	397	0.2	$ 83.39	$ 945.00	$0	11.3	11.3
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	99	0.1	$ 20.85	$ 236.25	$0	11.3	11.3
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	99	0.1	$ 20.85	$ 236.25	$0	11.3	11.3
18LED	3rd Floor Hallway	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	8736	11,741	12	T 74 R LED	RTLED50	50	0.6	SW	8,736	5,242	6,500	0.7	$ 887.26	$ 2,835.00	$0	3.2	3.2
18LED	North Wing Group Room 200	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	1600	1,075	6	T 74 R LED	RTLED50	50	0.3	SW	1,600	480	595	0.4	$ 125.08	$ 1,417.50	$0	11.3	11.3
18LED	North Wing Group Room 201	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	SW	1,600	320	397	0.2	$ 83.39	$ 945.00	$0	11.3	11.3
18LED	North Wing Room 202	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 203	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 204	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 205	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 206	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	SW	1,600	240	298	0.2	$ 62.54	$ 708.75	$0	11.3	11.3
18LED	North Wing Room 207	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 208	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 209	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	SW	1,600	240	298	0.2	$ 62.54	$ 708.75	$0	11.3	11.3
18LED	North Wing Room 210	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 211	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 212	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 213	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 214	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 215	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	SW	1,600	320	397	0.2	$ 83.39	$ 945.00	$0	11.3	11.3
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	99	0.1	$ 20.85	$ 236.25	$0	11.3	11.3
7LED	Men's Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	1600	96	1	2T 46 R LED	2RTLED	25	0.0	SW	1,600	40	56	0.0	$ 11.77	$ 202.50	$0	17.2	17.2
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	99	0.1	$ 20.85	$ 236.25	$0	11.3	11.3
7LED	Women's Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	1600	96	1	2T 46 R LED	2RTLED	25	0.0	SW	1,600	40	56	0.0	$ 11.77	$ 202.50	$0	17.2	17.2
18LED	2nd Floor Hallway	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	8736	14,676	15	T 74 R LED	RTLED50	50	0.8	SW	8,736	6,552	8,124	0.9	$ 1,109.08	$ 3,543.75	$0	3.2	3.2
18LED	North Wing Room 103	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 104	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 105	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 106	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 107	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	SW	1,600	240	298	0.2	$ 62.54	$ 708.75	$0	11.3	11.3
18LED	North Wing Room 108	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	99	0.1	$ 20.85	$ 236.25	$0	11.3	11.3
18LED	North Wing Room 109	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 110	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 111	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 112	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 113	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 114	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 115	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Room 116	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	SW	1,600	240	298	0.2	$ 62.54	$ 708.75	$0	11.3	11.3
18LED	2nd Floor Hallway	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	8736	15,655	16	T 74 R LED	RTLED50	50	0.8	SW	8,736	6,989	8,666	1.0	$ 1,183.02	$ 3,780.00	$0	3.2	3.2
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	99	0.1	$ 20.85	$ 236.25	$0	11.3	11.3
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	99	0.1	$ 20.85	$ 236.25	$0	11.3	11.3
18LED	North Wing Basement Computer Storage Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Basement Maintenance Supervisor Office	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
18LED	North Wing Basement Supply Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	198	0.1	$ 41.69	$ 472.50	$0	11.3	11.3
46LED	Open Area	10	W 32 C F 2 (ELE)	F42LL	60	0.6	SW	1600	960	10	4 ft LED Tube	200732x2	30	0.3	SW	1,600	480	480	0.3	$ 100.87	$ 2,187.00	$0	21.7	21.7
46LED	Maintenance Area	3	W 32 C F 2 (ELE)	F42LL	60	0.2	SW	1600	288	3	4 ft LED Tube	200732x2	30	0.1	SW	1,600	144	144	0.1	$ 30.26	$ 656.10	$0	21.7	21.7
18LED	Records Room	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	SW	1,600	240	298	0.2	$ 62.54	$ 708.75	$0	11.3	11.3
7LED	Boiler Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	8736	524	1	2T 46 R LED	2RTLED	25	0.0	SW	8,736	218	306	0.0	$ 41.74	$ 202.50	$0	4.9	4.9
18LED	Maintenance Area	5	T 32 R F 4 (ELE)	F44ILL	112	0.6	SW	1600	896	5	T 74 R LED	RTLED50	50	0.3	SW	1,600	400	496	0.3	$ 104.23	$ 1,181.25	$0	11.3	11.3
6LED	Annex Room 225	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 226	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 227	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 228	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 229	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 230	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 231	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	1600	691	3	T 74 R LED	RTLED50	50	0.2	SW	1,600	240	451	0.3	$ 94.82	$ 708.75	$0	7.5	7.5
6LED	Annex Room 232	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 233	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 234 Records Room	8	T 34 R F 4 (MAG)	F44EE	144	1.2	SW	1600	1,843	8	T 74 R LED	RTLED50	50	0.4	SW	1,600	640	1,203	0.8	$ 252.85	$ 1,890.00	$0	7.5	7.5
6LED	Annex Room 235 Lunch Room	8	T 34 R F 4 (MAG)	F44EE	144	1.2	SW	1600	1,843	8	T 74 R LED	RTLED50	50	0.4	SW	1,600	640	1,203	0.8	$ 252.85	$ 1,890.00	$0	7.5	7.5
6LED	Annex Room 236	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 237	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 238	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
6LED	Annex Room 238A	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
4LED	Annex Room 238A	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	1600	115	1	2T XX R LED	2RTLED	25	0.0	SW	1,600	40	75	0.0	$ 15.80	$ 202.50	$0	12.8	12.8
6LED	Client Waiting Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	8736	1,258	1	T 74 R LED	RTLED50	50	0.1	SW	8,736	437	821	0.1	$ 112.10	$ 236.25	$0	2.1	2.1
6LED	Annex Room 123	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Annex Room 124	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	Men's Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
6LED	Women's Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
6LED	Annex Room 125	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
6LED	Annex Room 126	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
4LED	Annex Room 127	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.3	SW	1600	461	4	2T XX R LED	2RTLED	25	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 810.00	$0	12.8	12.8
61LED	Annex Room 128	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 129	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 130	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 131	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 132	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 133	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 134	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 135	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 136	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Annex Room 137	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
4LED	Hallway	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.9	SW	8736	7,548	12	2T XX R LED	2RTLED	25	0.3	SW	8,736	2,621	4,927	0.6	$ 672.60	$ 2,430.00	$0	3.6	3.6
6LED	South Wing Room 321	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
6LED	South Wing Room 322	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
6LED	South Wing Room 325	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 236.25	$0	7.5	7.5
6LED	South Wing Room 326	7	T 34 R F 4 (MAG)	F44EE	144	1.0	SW	1600	1,613	7	T 74 R LED	RTLED50	50	0.4	SW	1,600	560	1,053	0.7	$ 221.25	$ 1,653.75	$0	7.5	7.5
4LED	South Wing Room 327	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.9	SW	1600	1,382	12	2T XX R LED	2RTLED	25	0.3	SW	1,600	480	902	0.6	$ 189.64	$ 2,430.00	$0	12.8	12.8
6LED	South Wing Room 328	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	1600	1,382	6	T 74 R LED	RTLED50	50	0.3	SW	1,600	480	902	0.6	$ 189.64	$ 1,417.50	$0	7.5	7.5
4LED	Traditional Room	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1600	691	6	2T XX R LED	2RTLED	25	0.2	SW	1,600	240	451	0.3	$ 94.82	$ 1,215.00	$0	12.8	12.8
6LED	Traditional Room	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	1600	922	4	T 74 R LED	RTLED50	50	0.2	SW	1,600	320	602	0.4	$ 126.43	$ 945.00	$0	7.5	7.5
88	Restroom	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1,600	24	-	0.0	$ -	$ -	$0		#DIV/0!
88	Restroom	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1,600	24	-	0.0	$ -	$ -	$0		#DIV/0!
88	Closet	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1,600	24	-	0.0	$ -	$ -	$0		#DIV/0!
4LED	Hallway	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	8736	629	1	2T XX R LED	2RTLED	25	0.0	SW	8,736	218	411	0.0	$ 56.05	$ 202.50	$0	3.6	3.6
6LED	Hallway	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	8736	1,258	1	T 74 R LED	RTLED50	50	0.1	SW	8,736	437	821	0.1	$ 112.10	$ 236.25	$0	2.1	2.1
6LED	South Wing Room 240	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 241	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 242	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 243	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 244	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 245	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 246	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 247	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 248	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 249	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 250	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5

Energy Audit of Middlesex County Mental Health Center

CHA Project No.28344

ECM-L1 Lighting Replacements

		EXISTING CONDITIONS							RETROFIT CONDITIONS							COST & SAVINGS ANALYSIS						
Field Code	Area Description Unique description of the location - Room number/Room name: Floor number (if applicable)	No. of Fixtures No. of fixtures before the retrofit	Standard Fixture Code "Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Fixt No.)	Exist Control Pre-inst. control device	Annual Hours Estimated daily hours for the usage group	Annual kWh (kW/space) * (Annual Hours)	Number of Fixtures No. of fixtures after the retrofit	Standard Fixture Code "Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape	Fixture Code Code from Table of Standard Fixture Wattages	Watts per Fixture Value from Table of Standard Fixture Wattages	kW/Space (Watts/Fixt) * (Number of Fixtures)	Retrofit Control Retrofit control device	Annual Hours Estimated annual hours for the usage group	Annual kWh (kW/space) * (Annual Hours)	Annual kWh Saved (Original Annual kWh) - (Retrofit Annual kWh)	Annual kW Saved (Original Annual kW) - (Retrofit Annual kW)	Annual $ Saved (kWh Saved) * ($/kWh)	Retrofit Cost Cost for renovations to lighting system	NJ Smart Start Lighting Incentive Prescriptive Lighting Measures	Simple Payback With Out Incentive Length of time for renovations cost to be recovered	Simple Payback Length of time for renovations cost to be recovered
6LED	South Wing Room 251	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 252	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
6LED	South Wing Room 253	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	SW	1,600	160	301	0.2	$ 63.21	$ 472.50	$0	7.5	7.5
41LED	Men's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150	1	4 ft LED Tube	200732x2	30	0.0	SW	1,600	48	102	0.1	$ 21.52	$ 218.70	$0	10.2	10.2
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	SW	1,600	42	27	0.0	$ 5.72	$ 189.00	$0	33.1	33.1
41LED	Women's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150	1	4 ft LED Tube	200732x2	30	0.0	SW	1,600	48	102	0.1	$ 21.52	$ 218.70	$0	10.2	10.2
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	SW	1,600	42	27	0.0	$ 5.72	$ 189.00	$0	33.1	33.1
4LED	Hallway	9	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.6	SW	8736	5,661	9	2RTLED	2RTLED	25	0.2	SW	8,736	1,966	3,695	0.4	$ 504.45	$ 1,822.50	$0	3.6	3.6
6LED	Secretarial Area	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	1600	691	3	T 74 R LED	RTLED50	50	0.2	SW	1,600	240	451	0.3	$ 94.82	$ 708.75	$0	7.5	7.5
61LED	Nurse Office Room 145	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Storage Room 114	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Room 143	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	SW	1,600	122	246	0.2	$ 51.78	$ 472.50	$0	9.1	9.1
61LED	Room 138	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184	1	T 59 R LED	RTLED38	38	0.0	SW	1,600	61	123	0.1	$ 25.89	$ 236.25	$0	9.1	9.1
61LED	Room 139	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184	1	T 59 R LED	RTLED38	38	0.0	SW	1,600	61	123	0.1	$ 25.89	$ 236.25	$0	9.1	9.1
61LED	Magic Fork Café	17	T 34 R F 3 (MAG)	F43EE	115	2.0	SW	1000	1,955	17	T 59 R LED	RTLED38	38	0.6	SW	1,000	646	1,309	1.3	$ 345.89	$ 4,016.25	$0	11.6	11.6
4LED	Magic Fork Café	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1000	432	6	2T XX R LED	2RTLED	25	0.2	SW	1,000	150	282	0.3	$ 74.52	$ 1,215.00	$0	16.3	16.3
41LED	Men's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150	1	4 ft LED Tube	200732x2	30	0.0	SW	1,600	48	102	0.1	$ 21.52	$ 218.70	$0	10.2	10.2
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	SW	1,600	42	27	0.0	$ 5.72	$ 189.00	$0	33.1	33.1
41LED	Women's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150	1	4 ft LED Tube	200732x2	30	0.0	SW	1,600	48	102	0.1	$ 21.52	$ 218.70	$0	10.2	10.2
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	SW	1,600	42	27	0.0	$ 5.72	$ 189.00	$0	33.1	33.1
4LED	Hallway	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.3	SW	8736	2,516	4	2T XX R LED	2RTLED	25	0.1	SW	8,736	874	1,642	0.2	$ 224.20	$ 810.00	$0	3.6	3.6
6LED	Particial Care Group Room	10	T 34 R F 4 (MAG)	F44EE	144	1.4	SW	1600	2,304	10	T 74 R LED	RTLED50	50	0.5	SW	1,600	800	1,504	0.9	$ 316.07	$ 2,362.50	$0	7.5	7.5
71	Boiler Room	4	I 60	I60/1	60	0.2	SW	8736	2,097	4	CF 26	CFQ26/1-L	27	0.1	SW	8,736	943	1,153	0.1	$ 157.42	$ 27.00	$0	0.2	0.2
4LED	Restroom	2	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	1600	230	2	2T XX R LED	2RTLED	25	0.1	SW	1,600	80	150	0.1	$ 31.61	$ 405.00	$0	12.8	12.8
41LED	Pump Room	2	1B 40 R F 2 (MAG)	F42SS	94	0.2	SW	1600	1,642	2	4 ft LED Tube	200732x2	30	0.1	SW	8,736	524	1,118	0.1	$ 152.65	$ 437.40	$0	2.9	2.9
61LED	Men's Room	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184	1	T 59 R LED	RTLED38	38	0.0	SW	1,600	61	123	0.1	$ 25.89	$ 236.25	$0	9.1	9.1
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	SW	1,600	42	27	0.0	$ 5.72	$ 189.00	$0	33.1	33.1
61LED	Women's Room	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184	1	T 59 R LED	RTLED38	38	0.0	SW	1,600	61	123	0.1	$ 25.89	$ 236.25	$0	9.1	9.1
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	SW	1,600	42	27	0.0	$ 5.72	$ 189.00	$0	33.1	33.1
61LED	Auditorium	15	T 34 R F 3 (MAG)	F43EE	115	1.7	SW	1300	2,243	15	T 59 R LED	RTLED38	38	0.6	SW	1,300	741	1,502	1.2	$ 346.78	$ 3,543.75	$0	10.2	10.2
4LED	Auditorium	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1300	562	6	2T XX R LED	2RTLED	25	0.2	SW	1,300	195	367	0.3	$ 84.67	$ 1,215.00	$0	14.4	14.4
71	Auditorium	3	I 60	I60/1	60	0.2	SW	1300	234	3	CF 26	CFQ26/1-L	27	0.1	SW	1,300	105	129	0.1	$ 29.72	$ 20.25	$0	0.7	0.7
61LED	Auditorium Storage	3	T 34 R F 3 (MAG)	F43EE	115	0.3	SW	1300	449	3	T 59 R LED	RTLED38	38	0.1	SW	1,300	148	300	0.2	$ 69.36	$ 708.75	$0	10.2	10.2
9LED	Outdoor Lighting	16	High Bay MH 200 35 Feet High	MH200/1	232	3.7	Breaker	4368	16,214	16	FXLED78	FXLED78/1	78	1.2	Breaker	4,368	5,451	10,763	2.5	$ 1,646.94	$ 13,507.13	$2,400	8.2	6.7
	Total	475				53.9			147,461	475			6,778	20.7			57,939	89,522	33.1	$15,520	$116,449	$2,400		
																		Demand Savings		33.1	$4,778			
																		kWh Savings		89,522	$10,743			
																		Total savings			$15,520		7.5	7.3

Energy Audit of Middlesex County Mental Health Center
CHA Project No.28344
ECM-L2 Install Occupancy Sensors

		EXISTING CONDITIONS								RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	**No. of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Exist Control**	**Annual Hours**	**Annual kWh**	**Number of Fixtures**	**Standard Fixture Code**	**Fixture Code**	**Watts per Fixture**	**kW/Space**	**Retrofit Control**	**Annual Hours**	**Annual kWh**	**Annual kWh Saved**	**Annual kW Saved**	**Annual $ Saved**	**Retrofit Cost**	**NJ Smart Start Lighting Incentive**	**Simple Payback With Out Incentive**	**Simple Payback**
Field Code	**Unique description of the location - Room number/Room name: Floor number (if applicable)**	**No. of fixtures before the retrofit**	**Lighting Fixture Code**	**Code from Table of Standard Fixture Wattages**	**Value from Table of Standard Fixture Wattages**	**(Watts/Fixt) * (Fixt No.)**	**Pre-inst. control device**	**Estimated annual hours for the usage group**	**(kW/space) * (Annual Hours)**	**No. of fixtures after the retrofit**	**"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape**	**Code from Table of Standard Fixture Wattages**	**Value from Table of Standard Fixture Wattages**	**(Watts/Fixt) * (Number of Fixtures)**	**Retrofit control device**	**Estimated annual hours for the usage group**	**(kW/space) * (Annual Hours)**	**(Original Annual kWh) - (Retrofit Annual kWh)**	**(Original Annual kW) - (Retrofit Annual kW)**	**(kW Saved) * ($/kWh)**	**Cost for renovations to lighting system**		**Length of time for renovations cost to be recovered**	**Length of time for renovations cost to be recovered**
7LED	North Wing Room 300	10	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.6	SW	1600	960.0	10	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.6	C-OCC	1200	720.0	240.0	0.0	$28.80	$270.00	$35.00	9.4	8.2
18LED	North Wing Room 303	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	716.8	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1200	537.6	179.2	0.0	$21.50	$270.00	$35.00	12.6	10.9
18LED	North Wing Room 304	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 305	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	716.8	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1200	537.6	179.2	0.0	$21.50	$270.00	$35.00	12.6	10.9
18LED	North Wing Room 306	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	716.8	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1200	537.6	179.2	0.0	$21.50	$270.00	$35.00	12.6	10.9
18LED	North Wing Room 307	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	716.8	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1200	537.6	179.2	0.0	$21.50	$270.00	$35.00	12.6	10.9
18LED	North Wing Room 308	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 309	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 310	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	537.6	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	C-OCC	1200	403.2	134.4	0.0	$16.13	$270.00	$35.00	16.7	14.6
18LED	North Wing Room 311	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 312	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 313	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 314	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 315	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	716.8	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	800	358.4	358.4	0.0	$43.01	$270.00	$35.00	6.3	5.5
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179.2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	800	89.6	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179.2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	800	89.6	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	3rd Floor Hallway	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	8736	11,741.2	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	NONE	8736	11,741.2	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18LED	North Wing Group Room 200	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	1600	1,075.2	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	C-OCC	800	537.6	537.6	0.0	$64.51	$270.00	$35.00	4.2	3.6
18LED	North Wing Group Room 201	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	716.8	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	800	358.4	358.4	0.0	$43.01	$270.00	$35.00	6.3	5.5
18LED	North Wing Room 202	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 203	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 204	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 205	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 206	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	537.6	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	C-OCC	1200	403.2	134.4	0.0	$16.13	$270.00	$35.00	16.7	14.6
18LED	North Wing Room 207	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 208	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 209	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	537.6	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	C-OCC	1200	403.2	134.4	0.0	$16.13	$270.00	$35.00	16.7	14.6
18LED	North Wing Room 210	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 211	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 212	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 213	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 214	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 215	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	716.8	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	C-OCC	1200	537.6	179.2	0.0	$21.50	$270.00	$35.00	12.6	10.9
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179.2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	800	89.6	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
7LED	Men's Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	1600	96.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	800	48.0	48.0	0.0	$5.76	$270.00	$35.00	46.9	40.8
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179.2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	800	89.6	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
7LED	Women's Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	1600	96.0	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	800	48.0	48.0	0.0	$5.76	$270.00	$35.00	46.9	40.8
18LED	2nd Floor Hallway	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	8736	14,676.5	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	C-OCC	8736	14,676.5	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
18LED	North Wing Room 103	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 104	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 105	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 106	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 107	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	537.6	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	C-OCC	1200	403.2	134.4	0.0	$16.13	$270.00	$35.00	16.7	14.6
18LED	North Wing Room 108	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179.2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	1200	134.4	44.8	0.0	$5.38	$270.00	$35.00	50.2	43.7
18LED	North Wing Room 109	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 110	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 111	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 112	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 113	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 114	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 115	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Room 116	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	537.6	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	C-OCC	1200	403.2	134.4	0.0	$16.13	$270.00	$35.00	16.7	14.6
18LED	2nd Floor Hallway	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	8736	15,654.9	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	NONE	8736	15,654.9	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179.2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	800	89.6	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179.2	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	C-OCC	800	89.6	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Basement Computer Storage Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	800	179.2	179.2	0.0	$21.50	$270.00	$35.00	12.6	10.9
18LED	North Wing Basement Maintenance Supervisor Office	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	1200	268.8	89.6	0.0	$10.75	$270.00	$35.00	25.1	21.9
18LED	North Wing Basement Supply Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358.4	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	C-OCC	800	179.2	179.2	0.0	$21.50	$270.00	$35.00	12.6	10.9
46LED	Open Area	10	W 32 C F 2 (ELE)	F42LL	60	0.6	SW	1600	960.0	10	W 32 C F 2 (ELE)	F42LL	60	0.6	C-OCC	800	480.0	480.0	0.0	$57.60	$270.00	$35.00	4.7	4.1
46LED	Maintenance Area	3	W 32 C F 2 (ELE)	F42LL	60	0.2	SW	1600	288.0	3	W 32 C F 2 (ELE)	F42LL	60	0.2	C-OCC	800	144.0	144.0	0.0	$17.28	$270.00	$35.00	15.6	13.6
18LED	Records Room	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	537.6	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	C-OCC	800	268.8	268.8	0.0	$32.26	$270.00	$35.00	8.4	7.3
7LED	Boiler Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	8736	524.2	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	C-OCC	8736	524.2	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
18LED	Maintenance Area	5	T 32 R F 4 (ELE)	F44ILL	112	0.6	SW	1600	896.0	5	T 32 R F 4 (ELE)	F44ILL	112	0.6	C-OCC	800	448.0	448.0	0.0	$53.76	$270.00	$35.00	5.0	4.4
6LED	Annex Room 225	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 226	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 227	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 228	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 229	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 230	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 231	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	1600	691.2	3	T 34 R F 4 (MAG)	F44EE	144	0.4	C-OCC	1200	518.4	172.8	0.0	$20.74	$270.00	$35.00	13.0	11.3
6LED	Annex Room 232	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 233	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 234 Records Room	8	T 34 R F 4 (MAG)	F44EE	144	1.2	SW	1600	1,843.2	8	T 34 R F 4 (MAG)	F44EE	144	1.2	C-OCC	800	921.6	921.6	0.0	$110.59	$270.00	$35.00	2.4	2.1
6LED	Annex Room 235 Lunch Room	8	T 34 R F 4 (MAG)	F44EE	144	1.2	SW	1600	1,843.2	8	T 34 R F 4 (MAG)	F44EE	144	1.2	C-OCC	800	921.6	921.6	0.0	$110.59	$270.00	$35.00	2.4	2.1
6LED	Annex Room 236	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 237	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 238	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	1200	172.8	57.6	0.0	$6.91	$270.00	$35.00	39.1	34.0
6LED	Annex Room 238A	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	1200	172.8	57.6	0.0	$6.91	$270.00	$35.00	39.1	34.0
4LED	Annex Room 238A	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	1600	115.2	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	C-OCC	1200	86.4	28.8	0.0	$3.46	$270.00	$35.00	78.1	68.0
6LED	Client Waiting Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	8736	1,258.0	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	8736	1,258.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
6LED	Annex Room 123	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 124	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Men's Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	800	115.2	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Women's Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	800	115.2	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	Annex Room 125	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	1200	172.8	57.6	0.0	$6.91	$270.00	$35.00	39.1	34.0
6LED	Annex Room 126	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	1200	172.8	57.6	0.0	$6.91	$270.00	$35.00	39.1	34.0
4LED	Annex Room 127	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.3	SW	1600	460.8	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
61LED	Annex Room 128	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 129	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 130	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 131	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 132	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 133	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 134	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 135	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 136	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Annex Room 137	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
4LED	Hallway	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.9	SW	8736	7,547.9	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.9	C-OCC	8736	7,547.9	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
6LED	South Wing Room 321	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	1200	172.8	57.6	0.0	$6.91	$270.00	$35.00	39.1	34.0
6LED	South Wing Room 322	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	1200	172.8	57.6	0.0	$6.91	$270.00	$35.00	39.1	34.0
6LED	South Wing Room 325	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230.4	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	1200	172.8	57.6	0.0	$6.91	$270.00	$35.00	39.1	34.0
6LED	South Wing Room 326	7	T 34 R F 4 (MAG)	F44EE	144	1.0	SW	1600	1,612.8	7	T 34 R F 4 (MAG)	F44EE	144	1.0	C-OCC	1200	1,209.6	403.2	0.0	$48.38	$270.00	$35.00	5.6	4.9
4LED	South Wing Room 327	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.9	SW	1600	1,382.4	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.9	C-OCC	1200	1,036.8	345.6	0.0	$41.47	$270.00	$35.00	6.5	5.7
6LED	South Wing Room 328	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	1600	1,382.4	6	T 34 R F 4 (MAG)	F44EE	144	0.9	C-OCC	1200	1,036.8	345.6	0.0	$41.47	$270.00	$35.00	6.5	5.7
4LED	Traditional Room	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1600	691.2	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	C-OCC	1200	518.4	172.8	0.0	$20.74	$270.00	$35.00	13.0	11.3
6LED	Traditional Room	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	1600	921.6	4	T 34 R F 4 (MAG)	F44EE	144	0.6	C-OCC	1200	691.2	230.4	0.0	$27.65	$270.00	$35.00	9.8	8.5
88	Restroom	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24.0	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	C-OCC	800	12.0	12.0	0.0	$1.44	$270.00	$35.00	187.5	163.2
88	Restroom	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24.0	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	C-OCC	800	12.0	12.0	0.0	$1.44	$270.00	$35.00	187.5	163.2
88	Closet	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24.0	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	C-OCC	800	12.0	12.0	0.0	$1.44	$270.00	$35.00	187.5	163.2
4LED	Hallway	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	8736	629.0	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	C-OCC	8736	629.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
6LED	Hallway	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	8736	1,258.0	1	T 34 R F 4 (MAG)	F44EE	144	0.1	C-OCC	8736	1,258.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
6LED	South Wing Room 240	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 241	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 242	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 243	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 244	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 245	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 246	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 247	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 248	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 249	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 250	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0

Energy Audit of Middlesex County Mental Health Center

CHA Project No.28344

ECM-L2 Install Occupancy Sensors

		EXISTING CONDITIONS							RETROFIT CONDITIONS								COST & SAVINGS ANALYSIS						
	Area Description	No. of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Exist Control	Annual Hours	Annual kWh	Number of Fixtures	Standard Fixture Code	Fixture Code	Watts per Fixture	kW/Space	Retrofit Control	Annual Hours	Annual kWh	Annual kWh Saved	Annual kW Saved	Annual $ Saved	Retrofit Cost	NJ Smart Start Lighting Incentive	Simple Payback With Out Incentive	Simple Payback
Field Code	**Unique description of the location - Room number/Room name: Floor number (if applicable)**	**No. of fixtures before the retrofit**	**Lighting Fixture Code**	**Code from Table of Standard Fixture Wattages**	**Value from Table of Standard Fixture Wattages**	**(Watts/Fixt) * (Fixt No.)**	**Pre-inst. control device**	**Estimated annual hours for the usage group**	**(kW/space) * (Annual Hours)**	**No. of fixtures after the retrofit**	**"Lighting Fixture Code" Example 2T 40 R F(U) = 2'x2' Troff 40 w Recess. Floor 2 lamps U shape**	**Code from Table of Standard Fixture Wattages**	**Value from Table of Standard Fixture Wattages**	**(Watts/Fixt) * (Number of Fixtures)**	**Retrofit control device**	**Estimated annual hours for the usage group**	**(kW/space) * (Annual Hours)**	**(Original Annual kWh) - (Retrofit Annual kWh)**	**(Original Annual kW) - (Retrofit Annual kW)**	**(kW Saved) * ($/kWh)**	**Cost for renovations to lighting system**		**Length of time for renovations cost to be recovered**	**Length of time for renovations cost to be recovered**
6LED	South Wing Room 251	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 252	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
6LED	South Wing Room 253	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	460.8	2	T 34 R F 4 (MAG)	F44EE	144	0.3	C-OCC	1200	345.6	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
41LED	Men's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150.4	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	C-OCC	800	75.2	75.2	0.0	$9.02	$270.00	$35.00	29.9	26.0
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	68.8	1	W 34 W F 1 (MAG)	F41EE	43	0.0	C-OCC	800	34.4	34.4	0.0	$4.13	$270.00	$35.00	65.4	56.9
41LED	Women's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150.4	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	C-OCC	800	75.2	75.2	0.0	$9.02	$270.00	$35.00	29.9	26.0
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	68.8	1	W 34 W F 1 (MAG)	F41EE	43	0.0	C-OCC	800	34.4	34.4	0.0	$4.13	$270.00	$35.00	65.4	56.9
4LED	Hallway	9	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.6	SW	8736	5,660.9	9	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.6	C-OCC	8736	5,660.9	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
6LED	Secretarial Area	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	1600	691.2	3	T 34 R F 4 (MAG)	F44EE	144	0.4	C-OCC	1200	518.4	172.8	0.0	$20.74	$270.00	$35.00	13.0	11.3
61LED	Nurse Office Room 145	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Storage Room 114	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	800	184.0	184.0	0.0	$22.08	$270.00	$35.00	12.2	10.6
61LED	Room 143	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368.0	2	T 34 R F 3 (MAG)	F43EE	115	0.2	C-OCC	1200	276.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
61LED	Room 138	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184.0	1	T 34 R F 3 (MAG)	F43EE	115	0.1	C-OCC	1200	138.0	46.0	0.0	$5.52	$270.00	$35.00	48.9	42.6
61LED	Room 139	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184.0	1	T 34 R F 3 (MAG)	F43EE	115	0.1	C-OCC	1200	138.0	46.0	0.0	$5.52	$270.00	$35.00	48.9	42.6
61LED	Magic Fork Café	17	T 34 R F 3 (MAG)	F43EE	115	2.0	SW	1000	1,955.0	17	T 34 R F 3 (MAG)	F43EE	115	2.0	C-OCC	1000	1,955.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
4LED	Magic Fork Café	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1000	432.0	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	C-OCC	1000	432.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
41LED	Men's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150.4	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	C-OCC	800	75.2	75.2	0.0	$9.02	$270.00	$35.00	29.9	26.0
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	68.8	1	W 34 W F 1 (MAG)	F41EE	43	0.0	C-OCC	800	34.4	34.4	0.0	$4.13	$270.00	$35.00	65.4	56.9
41LED	Women's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150.4	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	C-OCC	800	75.2	75.2	0.0	$9.02	$270.00	$35.00	29.9	26.0
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	68.8	1	W 34 W F 1 (MAG)	F41EE	43	0.0	C-OCC	800	34.4	34.4	0.0	$4.13	$270.00	$35.00	65.4	56.9
4LED	Hallway	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.3	SW	8736	2,516.0	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.3	C-OCC	8736	2,516.0	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
6LED	Particial Care Group Room	10	T 34 R F 4 (MAG)	F44EE	144	1.4	SW	1600	2,304.0	10	T 34 R F 4 (MAG)	F44EE	144	1.4	C-OCC	1200	1,728.0	576.0	0.0	$69.12	$270.00	$35.00	3.9	3.4
71	Boiler Room	4	I 60	I60/1	60	0.2	SW	8736	2,096.6	4	I 60	I60/1	60	0.2	C-OCC	8736	2,096.6	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
4LED	Restroom	2	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	1600	230.4	2	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	C-OCC	800	115.2	115.2	0.0	$13.82	$270.00	$35.00	19.5	17.0
41LED	Pump Room	2	1B 40 R F 2 (MAG)	F42SS	94	0.2	SW	8736	1,642.4	2	1B 40 R F 2 (MAG)	F42SS	94	0.2	C-OCC	8736	1,642.4	0.0	0.0	$0.00	$270.00	$35.00		#DIV/0!
61LED	Men's Room	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184.0	1	T 34 R F 3 (MAG)	F43EE	115	0.1	C-OCC	800	92.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	68.8	1	W 34 W F 1 (MAG)	F41EE	43	0.0	C-OCC	800	34.4	34.4	0.0	$4.13	$270.00	$35.00	65.4	56.9
61LED	Women's Room	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184.0	1	T 34 R F 3 (MAG)	F43EE	115	0.1	C-OCC	800	92.0	92.0	0.0	$11.04	$270.00	$35.00	24.5	21.3
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	68.8	1	W 34 W F 1 (MAG)	F41EE	43	0.0	C-OCC	800	34.4	34.4	0.0	$4.13	$270.00	$35.00	65.4	56.9
61LED	Auditorium	15	T 34 R F 3 (MAG)	F43EE	115	1.7	SW	1300	2,242.5	15	T 34 R F 3 (MAG)	F43EE	115	1.7	C-OCC	650	1,121.3	1,121.3	0.0	$134.55	$270.00	$35.00	2.0	1.7
4LED	Auditorium	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1300	561.6	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	C-OCC	650	280.8	280.8	0.0	$33.70	$270.00	$35.00	8.0	7.0
71	Auditorium	3	I 60	I60/1	60	0.2	SW	1300	234.0	3	I 60	I60/1	60	0.2	C-OCC	650	117.0	117.0	0.0	$14.04	$270.00	$35.00	19.2	16.7
61LED	Auditorium Storage	3	T 34 R F 3 (MAG)	F43EE	115	0.3	SW	1300	448.5	3	T 34 R F 3 (MAG)	F43EE	115	0.3	C-OCC	650	224.3	224.3	0.0	$26.91	$270.00	$35.00	10.0	8.7
9LED	Outdoor Lighting	16	High Bay MH 200 35 Feet High	MH200/1	232	3.7	Breaker	4368	16,214.0	16	High Bay MH 200 35 Feet High	MH200/1	232	3.7	NONE	4368	16,214.0	0.0	0.0	$0.00	$0.00	$0.00		#DIV/0!
	Total	**475**				**53.9**			**147461.1**	**475.0**				**53.9**			**127332.2**	**20128.9**	**0.0**	**2415.5**	**41310.0**	**5355.0**		
																	Demand Savings			**0.0**	**$0**			
																	kWh Savings			**20,129**	**$2,415**			
																	Total Savings				**$2,415**		**17.1**	**14.9**

Energy Audit of Middlesex County Mental Health Center
CHA Project No.28344
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
7LED	North Wing Room 300	10	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.6	SW	1600	960	10	2T 46 R LED	2RTLED	25	0.3	C-OCC	1,200	300	660	0.4	$ 129.68	$ 2,295.00	$ 35	17.7	17.4
18LED	North Wing Room 303	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	240	477	0.2	$ 92.99	$ 1,215.00	$ 35	13.1	12.7
18LED	North Wing Room 304	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 305	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	240	477	0.2	$ 92.99	$ 1,215.00	$ 35	13.1	12.7
18LED	North Wing Room 306	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	240	477	0.2	$ 92.99	$ 1,215.00	$ 35	13.1	12.7
18LED	North Wing Room 307	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	240	477	0.2	$ 92.99	$ 1,215.00	$ 35	13.1	12.7
18LED	North Wing Room 308	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 309	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 310	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	180	358	0.2	$ 69.74	$ 978.75	$ 35	14.0	13.5
18LED	North Wing Room 311	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 312	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 313	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 314	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 315	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	C-OCC	800	160	557	0.2	$ 102.59	$ 1,215.00	$ 35	11.8	11.5
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	C-OCC	800	40	139	0.1	$ 25.65	$ 506.25	$ 35	19.7	18.4
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	C-OCC	800	40	139	0.1	$ 25.65	$ 506.25	$ 35	19.7	18.4
18LED	3rd Floor Hallway	12	T 32 R F 4 (ELE)	F44ILL	112	1.3	SW	8736	11,741	12	T 74 R LED	RTLED50	50	0.6	NONE	8,736	5,242	6,500	0.7	$ 887.26	$ 2,835.00	$ -	3.2	3.2
18LED	North Wing Group Room 200	6	T 32 R F 4 (ELE)	F44ILL	112	0.7	SW	1600	1,075	6	T 74 R LED	RTLED50	50	0.3	C-OCC	800	240	835	0.4	$ 153.88	$ 1,687.50	$ 35	11.0	10.7
18LED	North Wing Group Room 201	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	C-OCC	800	160	557	0.2	$ 102.59	$ 1,215.00	$ 35	11.8	11.5
18LED	North Wing Room 202	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 203	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 204	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 205	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 206	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	180	358	0.2	$ 69.74	$ 978.75	$ 35	14.0	13.5
18LED	North Wing Room 207	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 208	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 209	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	180	358	0.2	$ 69.74	$ 978.75	$ 35	14.0	13.5
18LED	North Wing Room 210	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 211	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 212	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 213	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 214	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 215	4	T 32 R F 4 (ELE)	F44ILL	112	0.4	SW	1600	717	4	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	240	477	0.2	$ 92.99	$ 1,215.00	$ 35	13.1	12.7
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	C-OCC	800	40	139	0.1	$ 25.65	$ 506.25	$ 35	19.7	18.4
7LED	Men's Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	1600	96	1	2T 46 R LED	2RTLED	25	0.0	C-OCC	800	20	76	0.0	$ 14.17	$ 472.50	$ 35	33.3	30.9
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	C-OCC	800	40	139	0.1	$ 25.65	$ 506.25	$ 35	19.7	18.4
7LED	Women's Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	1600	96	1	2T 46 R LED	2RTLED	25	0.0	C-OCC	800	20	76	0.0	$ 14.17	$ 472.50	$ 35	33.3	30.9
18LED	2nd Floor Hallway	15	T 32 R F 4 (ELE)	F44ILL	112	1.7	SW	8736	14,676	15	T 74 R LED	RTLED50	50	0.8	C-OCC	8,736	6,552	8,124	0.9	$ 1,109.08	$ 3,813.75	$ 35	3.4	3.4
18LED	North Wing Room 103	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 104	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 105	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 106	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 107	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	180	358	0.2	$ 69.74	$ 978.75	$ 35	14.0	13.5
18LED	North Wing Room 108	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	60	119	0.1	$ 23.25	$ 506.25	$ 35	21.8	20.3
18LED	North Wing Room 109	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 110	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 111	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 112	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 113	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 114	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 115	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Room 116	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	180	358	0.2	$ 69.74	$ 978.75	$ 35	14.0	13.5
18LED	2nd Floor Hallway	16	T 32 R F 4 (ELE)	F44ILL	112	1.8	SW	8736	15,655	16	T 74 R LED	RTLED50	50	0.8	NONE	8,736	6,989	8,666	1.0	$ 1,183.02	$ 3,780.00	$ -	3.2	3.2
18LED	Men's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	C-OCC	800	40	139	0.1	$ 25.65	$ 506.25	$ 35	19.7	18.4
18LED	Women's Room	1	T 32 R F 4 (ELE)	F44ILL	112	0.1	SW	1600	179	1	T 74 R LED	RTLED50	50	0.1	C-OCC	800	40	139	0.1	$ 25.65	$ 506.25	$ 35	19.7	18.4
18LED	North Wing Basement Computer Storage Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	800	80	278	0.1	$ 51.29	$ 742.50	$ 35	14.5	13.8
18LED	North Wing Basement Maintenance Supervisor Office	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	238	0.1	$ 46.49	$ 742.50	$ 35	16.0	15.2
18LED	North Wing Basement Supply Room	2	T 32 R F 4 (ELE)	F44ILL	112	0.2	SW	1600	358	2	T 74 R LED	RTLED50	50	0.1	C-OCC	800	80	278	0.1	$ 51.29	$ 742.50	$ 35	14.5	13.8
46LED	Open Area	10	W 32 C F 2 (ELE)	F42LL	60	0.6	SW	1600	960	10	4 ft LED Tube	200732x2	30	0.3	C-OCC	800	240	720	0.3	$ 129.67	$ 2,457.00	$ 35	18.9	18.7
46LED	Maintenance Area	3	W 32 C F 2 (ELE)	F42LL	60	0.2	SW	1600	288	3	4 ft LED Tube	200732x2	30	0.1	C-OCC	800	72	216	0.1	$ 38.90	$ 926.10	$ 35	23.8	22.9
18LED	Records Room	3	T 32 R F 4 (ELE)	F44ILL	112	0.3	SW	1600	538	3	T 74 R LED	RTLED50	50	0.2	C-OCC	800	120	418	0.2	$ 76.94	$ 978.75	$ 35	12.7	12.3
7LED	Boiler Room	1	2T 32 R F 2 (u) (ELE) Thin Tube	FU2LL	60	0.1	SW	8736	524	1	2T 46 R LED	2RTLED	25	0.0	C-OCC	8,736	218	306	0.0	$ 41.74	$ 472.50	$ 35	11.3	10.5
18LED	Maintenance Area	5	T 32 R F 4 (ELE)	F44ILL	112	0.6	SW	1600	896	5	T 74 R LED	RTLED50	50	0.3	C-OCC	800	200	696	0.3	$ 128.23	$ 1,451.25	$ 35	11.3	11.0
6LED	Annex Room 225	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 226	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 227	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 228	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 229	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 230	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 231	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	1600	691	3	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	180	511	0.3	$ 102.02	$ 978.75	$ 35	9.6	9.3
6LED	Annex Room 232	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 233	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 234 Records Room	8	T 34 R F 4 (MAG)	F44EE	144	1.2	SW	1600	1,843	8	T 74 R LED	RTLED50	50	0.4	C-OCC	800	320	1,523	0.8	$ 291.25	$ 2,160.00	$ 35	7.4	7.3
6LED	Annex Room 235 Lunch Room	8	T 34 R F 4 (MAG)	F44EE	144	1.2	SW	1600	1,843	8	T 74 R LED	RTLED50	50	0.4	C-OCC	800	320	1,523	0.8	$ 291.25	$ 2,160.00	$ 35	7.4	7.3
6LED	Annex Room 236	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 237	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 238	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	60	170	0.1	$ 34.01	$ 506.25	$ 35	14.9	13.9
6LED	Annex Room 238A	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	60	170	0.1	$ 34.01	$ 506.25	$ 35	14.9	13.9
4LED	Annex Room 238A	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	1600	115	1	2T XX R LED	2RTLED	25	0.0	C-OCC	1,200	30	85	0.0	$ 17.00	$ 472.50	$ 35	27.8	25.7
6LED	Client Waiting Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	8736	1,258	1	T 74 R LED	RTLED50	50	0.1	C-OCC	8,736	437	821	0.1	$ 112.10	$ 506.25	$ 35	4.5	4.2
6LED	Annex Room 123	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Annex Room 124	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	Men's Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	800	40	190	0.1	$ 36.41	$ 506.25	$ 35	13.9	12.9
6LED	Women's Room	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	800	40	190	0.1	$ 36.41	$ 506.25	$ 35	13.9	12.9
6LED	Annex Room 125	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	60	170	0.1	$ 34.01	$ 506.25	$ 35	14.9	13.9
6LED	Annex Room 126	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	60	170	0.1	$ 34.01	$ 506.25	$ 35	14.9	13.9
4LED	Annex Room 127	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.3	SW	1600	461	4	2T XX R LED	2RTLED	25	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 1,080.00	$ 35	15.9	15.4
61LED	Annex Room 128	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 129	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 130	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 131	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 132	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 133	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 134	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 135	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 136	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Annex Room 137	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
4LED	Hallway	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.9	SW	8736	7,548	12	2T XX R LED	2RTLED	25	0.3	C-OCC	8,736	2,621	4,927	0.6	$ 672.60	$ 2,700.00	$ 35	4.0	4.0
6LED	South Wing Room 321	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	60	170	0.1	$ 34.01	$ 506.25	$ 35	14.9	13.9
6LED	South Wing Room 322	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	60	170	0.1	$ 34.01	$ 506.25	$ 35	14.9	13.9
6LED	South Wing Room 325	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	1600	230	1	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	60	170	0.1	$ 34.01	$ 506.25	$ 35	14.9	13.9
6LED	South Wing Room 326	7	T 34 R F 4 (MAG)	F44EE	144	1.0	SW	1600	1,613	7	T 74 R LED	RTLED50	50	0.4	C-OCC	1,200	420	1,193	0.7	$ 238.05	$ 1,923.75	$ 35	8.1	7.9
4LED	South Wing Room 327	12	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.9	SW	1600	1,382	12	2T XX R LED	2RTLED	25	0.3	C-OCC	1,200	360	1,022	0.6	$ 204.04	$ 2,700.00	$ 35	13.2	13.1
6LED	South Wing Room 328	6	T 34 R F 4 (MAG)	F44EE	144	0.9	SW	1600	1,382	6	T 74 R LED	RTLED50	50	0.3	C-OCC	1,200	360	1,022	0.6	$ 204.04	$ 1,687.50	$ 35	8.3	8.1
4LED	Traditional Room	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1600	691	6	2T XX R LED	2RTLED	25	0.2	C-OCC	1,200	180	511	0.3	$ 102.02	$ 1,485.00	$ 35	14.6	14.2
6LED	Traditional Room	4	T 34 R F 4 (MAG)	F44EE	144	0.6	SW	1600	922	4	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	240	682	0.4	$ 136.03	$ 1,215.00	$ 35	8.9	8.7
88	Restroom	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	C-OCC	800	12	12	0.0	$ 1.44	$ 270.00	$ 35	187.5	163.2
88	Restroom	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	C-OCC	800	12	12	0.0	$ 1.44	$ 270.00	$ 35	187.5	163.2
88	Closet	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	SW	1600	24	1	CF 13 1 LAMP	CFQ13/1-L	15	0.0	C-OCC	800	12	12	0.0	$ 1.44	$ 270.00	$ 35	187.5	163.2
4LED	Hallway	1	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	8736	629	1	2T XX R LED	2RTLED	25	0.0	C-OCC	8,736	218	411	0.0	$ 56.05	$ 472.50	$ 35	8.4	7.8
6LED	Hallway	1	T 34 R F 4 (MAG)	F44EE	144	0.1	SW	8736	1,258	1	T 74 R LED	RTLED50	50	0.1	C-OCC	8,736	437	821	0.1	$ 112.10	$ 506.25	$ 35	4.5	4.2
6LED	South Wing Room 240	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 241	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 242	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 243	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 244	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 245	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 246	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 247	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 248	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 249	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 250	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4

Energy Audit of Middlesex County Mental Health Center
CHA Project No.28344
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
6LED	South Wing Room 251	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 252	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
6LED	South Wing Room 253	2	T 34 R F 4 (MAG)	F44EE	144	0.3	SW	1600	461	2	T 74 R LED	RTLED50	50	0.1	C-OCC	1,200	120	341	0.2	$ 68.01	$ 742.50	$ 35	10.9	10.4
41LED	Men's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150	1	4 ft LED Tube	200732x2	30	0.0	C-OCC	800	24	126	0.1	$ 24.40	$ 488.70	$ 35	20.0	18.6
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	C-OCC	800	21	48	0.0	$ 8.21	$ 459.00	$ 35	55.9	51.6
41LED	Women's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150	1	4 ft LED Tube	200732x2	30	0.0	C-OCC	800	24	126	0.1	$ 24.40	$ 488.70	$ 35	20.0	18.6
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	C-OCC	800	21	48	0.0	$ 8.21	$ 459.00	$ 35	55.9	51.6
4LED	Hallway	9	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.6	SW	8736	5,661	9	2T XX R LED	2RTLED	25	0.2	C-OCC	8,736	1,966	3,695	0.4	$ 504.45	$ 2,092.50	$ 35	4.1	4.1
6LED	Secretarial Area	3	T 34 R F 4 (MAG)	F44EE	144	0.4	SW	1600	691	3	T 74 R LED	RTLED50	50	0.2	C-OCC	1,200	180	511	0.3	$ 102.02	$ 978.75	$ 35	9.6	9.3
61LED	Nurse Office Room 145	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Storage Room 114	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	800	61	307	0.2	$ 59.08	$ 742.50	$ 35	12.6	12.0
61LED	Room 143	2	T 34 R F 3 (MAG)	F43EE	115	0.2	SW	1600	368	2	T 59 R LED	RTLED38	38	0.1	C-OCC	1,200	91	277	0.2	$ 55.43	$ 742.50	$ 35	13.4	12.8
61LED	Room 138	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184	1	T 59 R LED	RTLED38	38	0.0	C-OCC	1,200	46	138	0.1	$ 27.71	$ 506.25	$ 35	18.3	17.0
61LED	Room 139	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184	1	T 59 R LED	RTLED38	38	0.0	C-OCC	1,200	46	138	0.1	$ 27.71	$ 506.25	$ 35	18.3	17.0
61LED	Magic Fork Café	17	T 34 R F 3 (MAG)	F43EE	115	2.0	SW	1000	1,955	17	T 59 R LED	RTLED38	38	0.6	C-OCC	1,000	646	1,309	1.3	$ 345.89	$ 4,286.25	$ 35	12.4	12.3
4LED	Magic Fork Café	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1000	432	6	2T XX R LED	2RTLED	25	0.2	C-OCC	1,000	150	282	0.3	$ 74.52	$ 1,485.00	$ 35	19.9	19.5
41LED	Men's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150	1	4 ft LED Tube	200732x2	30	0.0	C-OCC	800	24	126	0.1	$ 24.40	$ 488.70	$ 35	20.0	18.6
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	C-OCC	800	21	48	0.0	$ 8.21	$ 459.00	$ 35	55.9	51.6
41LED	Women's Room	1	1B 40 R F 2 (MAG)	F42SS	94	0.1	SW	1600	150	1	4 ft LED Tube	200732x2	30	0.0	C-OCC	800	24	126	0.1	$ 24.40	$ 488.70	$ 35	20.0	18.6
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	C-OCC	800	21	48	0.0	$ 8.21	$ 459.00	$ 35	55.9	51.6
4LED	Hallway	4	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.3	SW	8736	2,516	4	2T XX R LED	2RTLED	25	0.1	C-OCC	8,736	874	1,642	0.2	$ 224.20	$ 1,080.00	$ 35	4.8	4.7
6LED	Particial Care Group Room	10	T 34 R F 4 (MAG)	F44EE	144	1.4	SW	1600	2,304	10	T 74 R LED	RTLED50	50	0.5	C-OCC	1,200	600	1,704	0.9	$ 340.07	$ 2,632.50	$ 35	7.7	7.6
71	Boiler Room	4	I 60	I60/1	60	0.2	SW	8736	2,097	4	CF 26	CFQ26/1-L	27	0.1	C-OCC	8,736	943	1,153	0.1	$ 157.42	$ 297.00	$ 35	1.9	1.7
4LED	Restroom	2	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.1	SW	1600	230	2	2T XX R LED	2RTLED	25	0.1	C-OCC	800	40	190	0.1	$ 36.41	$ 675.00	$ 35	18.5	17.6
41LED	Pump Room	2	1B 40 R F 2 (MAG)	F42SS	94	0.2	SW	8736	1,642	2	4 ft LED Tube	200732x2	30	0.1	C-OCC	8,736	524	1,118	0.1	$ 152.65	$ 707.40	$ 35	4.6	4.4
61LED	Men's Room	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184	1	T 59 R LED	RTLED38	38	0.0	C-OCC	800	30	154	0.1	$ 29.54	$ 506.25	$ 35	17.1	16.0
3	Men's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	C-OCC	800	21	48	0.0	$ 8.21	$ 459.00	$ 35	55.9	51.6
61LED	Women's Room	1	T 34 R F 3 (MAG)	F43EE	115	0.1	SW	1600	184	1	T 59 R LED	RTLED38	38	0.0	C-OCC	800	30	154	0.1	$ 29.54	$ 506.25	$ 35	17.1	16.0
3	Women's Room	1	W 34 W F 1 (MAG)	F41EE	43	0.0	SW	1600	69	1	W 28 W F 1	F41SSILL	26	0.0	C-OCC	800	21	48	0.0	$ 8.21	$ 459.00	$ 35	55.9	51.6
61LED	Auditorium	15	T 34 R F 3 (MAG)	F43EE	115	1.7	SW	1300	2,243	15	T 59 R LED	RTLED38	38	0.6	C-OCC	650	371	1,872	1.2	$ 391.24	$ 3,813.75	$ 35	9.7	9.7
4LED	Auditorium	6	2B 34 R F 2 (u) (MAG)	FU2EE	72	0.4	SW	1300	562	6	2T XX R LED	2RTLED	25	0.2	C-OCC	650	98	464	0.3	$ 96.37	$ 1,485.00	$ 35	15.4	15.0
71	Auditorium	3	I 60	I60/1	60	0.2	SW	1300	234	3	CF 26	CFQ26/1-L	27	0.1	C-OCC	650	53	181	0.1	$ 36.04	$ 290.25	$ 35	8.1	7.1
61LED	Auditorium Storage	3	T 34 R F 3 (MAG)	F43EE	115	0.3	SW	1300	449	3	T 59 R LED	RTLED38	38	0.1	C-OCC	650	74	374	0.2	$ 78.25	$ 978.75	$ 35	12.5	12.1
9LED	Outdoor Lighting	16	High Bay MH 200 35 Feet High	MH200/1	232	3.7	Breaker	4368	16,214	16	FXLED78	FXLED78/1	78	1.2	NONE	4,368	5,451	10,763	2.5	$ 1,646.94	$ 13,507.13	$ 2,400	8.2	6.7
S	Total	475				53.9			147,461	475				20.7			50,088		33.1	16,462	157,759	$7,755		
S																	Demand Savings			33.1	$4,778			
S																	kWh Savings			97,373	$11,685			
S																	Total Savings				$16,462		9.6	9.1

APPENDIX D

New Jersey Board of Public Utilities Incentives

i. **Smart Start**

ii. **Direct Install**

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

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

I. SMART START

NJ SmartStart Buildings

Program Overview

With New Jersey SmartStart Buildings ...

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

Special Notice

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

Visit the Sandy web page for details and important links.

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

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

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

Getting Started

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

PAST PROGRAMS

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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

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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

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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

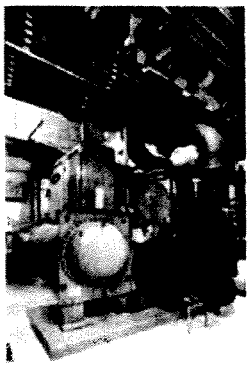
ENERGY BENCHMARKING

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

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TOOLS AND RESOURCES

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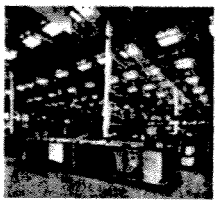
CONTACT US

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

CONTACT US

Home » Commercial & Industrial » Programs

Energy Savings Improvement Program

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

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

Local Government
School Districts (K-12)

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

The Board also adopted protocols to measure energy savings:

Measuring Energy Savings
Procedures for Implementation

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

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

FIRST STEP – ENERGY AUDIT

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

ENERGY REDUCTION PLANS

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

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

ESIP PROGRAM

Final version 42413

BPU RULES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX E

Photovoltaic Analysis

Middlesex Mental Health Center

Cost of Electricity	$0.187	/kWh
Electricity Usage	480,000	kWh/yr
System Unit Cost	$4,000	/kW

Photovoltaic (PV) Solar Power Generation - Screening Assessment

Budgetary Cost	Annual Utility Savings				Estimated Maintenance Savings	Total Savings	Federal Tax Credit	New Jersey Renewable ** SREC	Payback (without incentive)	Payback (with incentive)
$	kW	kWh	therms	$	$	$	$	$	Years	Years
$120,000	**30.0**	**34,664**	**0**	**$6,482**	**0**	**$6,482**	**$0**	**$5,373**	**18.5**	**10.1**

** Estimated Solar Renewable Energy Certificate Program (SREC) SREC for 15 Years= $155 /1000kwh

Area Output*

951 m2
10,241 ft2

Perimeter Output*

160 m
525 ft

Available Roof Space for PV:

(Area Output - 10 ft x Perimeter) x 85%
4,243 ft2

Approximate System Size: Is the roof flat? (Yes/No) Yes

8	watt/ft2	
33,943	DC watts	
30	kW	Enter into PV Watts

PV Watts Inputs***

Array Tilt Angle	20	Enter into PV Watts (always 20 if flat, if pitched - enter estimated roof angle)
Array Azimuth	180	Enter into PV Watts (default)
Zip Code	08861	Enter into PV Watts
DC/AC Derate Factor	0.83	Enter info PV Watts

PV Watts Output

34,664 annual kWh calculated in PV Watts program

% Offset Calc

Usage	480,000	(from utilities)
PV Generation	34,664	(generated using PV Watts)
% offset	7%	

* http://www.freemaptools.com/area-calculator.htm
** http://www.flettexchange.com
*** http://gisatnrel.nrel.gov/PVWatts_Viewer/index.html

PVWatts * * * AC Energy & Cost Savings

Cautions for Interpreting the Results

(Type comments here to appear on printout; maximum 1 row of 80 characters.)

Station Identification	
City:	Newark
State:	New_Jersey
Latitude:	40.70° N
Longitude:	74.17° W
Elevation:	9 m
PV System Specifications	
DC Rating:	30.0 kW
DC to AC Derate Factor:	0.770
AC Rating:	23.1 kW
Array Type:	Fixed Tilt
Array Tilt:	20.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	0.2 ¢/kWh

Results			
Month	Solar Radiation (kWh/m ^{2}/day)	AC Energy (kWh)	Energy Value ($)
1	2.78	2025	3.79
2	3.54	2335	4.37
3	4.35	3096	5.79
4	4.95	3279	6.13
5	5.69	3808	7.12
6	5.86	3684	6.89
7	5.73	3678	6.88
8	5.47	3471	6.49
9	4.91	3112	5.82
10	3.99	2697	5.04
11	2.68	1807	3.38
12	2.35	1673	3.13
Year	4.36	34664	64.82

Output Hourly Performance Data * Output Results as Text

About the Hourly Performance Data Saving Text from a Browser

Run PVWATTS v.1 for another US location or an International location
Run PVWATTS v.2 (US only)

Please send questions and comments regarding PVWATTS to Webmaster

Disclaimer and copyright notice

Return to RReDC home page (http://www.nrel.gov/rredc)

APPENDIX F

Photos

ECM-1 Replace single pane windows in South Wing with double pane windows

ECM-2 Replace the gas fired boilers with high efficiency condensing boilers

ECM-3 Replace DX cooling systems serving the South wing and the Annex with high efficiency DX cooling systems

ECM-4 Replace Chiller serving the North wing with a High efficiency chiller

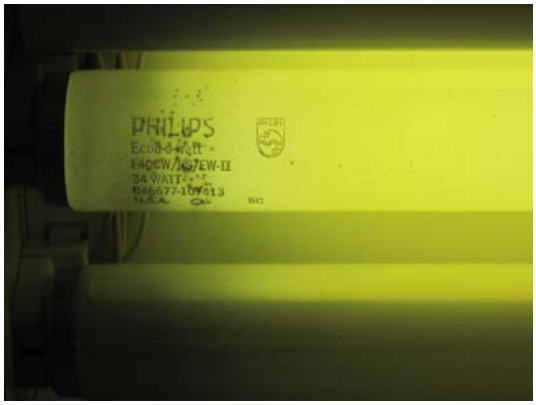
ECM-5 Install a variable refrigerant volume (VRV) heating and cooling system and dedicated outdoor air energy recovery system to replace the existing HVAC system in all wings. (Note: ECM-5 is an alternative to ECM-2, 3 and 4. Based on the existing building construction and operational requirements this option is considered to provide the least disruption to the Center during construction.)

ECM-6 Install a central Direct Digital Control system.

ECM-7 Replace electric domestic hot water heaters and one gas fired DHW heater with one gas fired condensing domestic hot water heater.

ECM-8 Replace plumbing fixtures with low flow fixtures

ECM-L1 Lighting Replacement / Upgrades



ECM-L2 Install Lighting Controls (Occupancy Sensors)

ECM-L3 Lighting Replacements with Controls (Occupancy Sensors)

See ECM L-1 and L-2

APPENDIX G

EPA Portfolio Manager

ENERGY STAR® Statement of Energy Performance

66

ENERGY STAR® Score[1]

Middlesex Mental Health

Primary Property Function: Office
Gross Floor Area (ft²): 40,000
Built: 1968

For Year Ending: February 28, 2014
Date Generated: April 23, 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
Middlesex Mental Health 577 Lee Street Perth Amboy, New Jersey 08861	_____ , (____)____-_____	____ _____ , (____)____-_____ _____

Property ID: 4040983

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
78.5 kBtu/ft²

Source EUI
168 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	1,637,760 (52%)
Natural Gas (kBtu)	1,500,800 (48%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	94.1
National Median Source EUI (kBtu/ft²)	201.5
% Diff from National Median Source EUI	-17%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	287

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)