Local Government Energy Audit:
Energy Audit Report

Municipal Courthouse

City of Jersey City
365 Summit Avenue
Jersey City, NJ 07306

February 19, 2018

Final Report by:
TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities and recommend upgrades to the facility's energy using equipment and systems. Approximate savings are included in this report to help make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. Further design and analysis may be necessary in order to implement some of the measures recommended in this report.

The energy conservation measures and estimates of energy savings have been reviewed for technical accuracy. However, estimates of final energy savings are not guaranteed, because final savings may depend on behavioral factors and other uncontrollable variables. TRC Energy Services (TRC) and New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

Estimated installation costs are based on TRC's experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from *RS Means*. The owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Since actual installed costs can vary widely for certain measures and conditions, TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. The owner of the facility should review available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

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1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Municipal Courthouse. The goal of an LGEA is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and put you in a position to implement the ECMs. The LGEA also sets you on the path to receive financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing the ECMs.

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey local government in controlling energy costs and protecting our environment by offering a full spectrum of energy management options.

1.1 Facility Summary

The Jersey City Municipal Courthouse is a 60,000 square foot facility comprised of various space types. The Municipal Court is a statutory court that is responsible for hearing motor vehicle traffic violations and disorderly and petty disorderly criminal offenses within the jurisdiction of the municipality. Construction was completed in 2000. The building is three (3) floors (including the basement) and includes courtrooms, offices, conference rooms, police personnel rooms, holding cells, a garage, and a basement mechanical space. Typically, 100 to 400 people occupy the facility during normal operating hours. After-hours occupancy consists of approximately 50 people. The scheduled occupancy for the six courtrooms varies throughout the week.

The foundation consists of cast-in-place concrete perimeter wall footings with concrete foundation walls. The foundation systems include reinforced concrete column pads. Exterior walls are finished with brick masonry. The building has a flat roof covered with a multi-ply bituminous built-up membrane, which is in good condition. The building's base and its perimeter were inspected for signs of uncontrolled moisture or water presence and other energy-compromising issues. Overall the building envelope appears to be in relatively good condition with no obvious signs of leakage.

The windows are glazed with insulated panes set in metal frames. The front-entry area windows are part of an aluminum-framed storefront system incorporating the entry doors. The entrance doors are fully glazed and aluminum framed doors set in the storefront framing system. Windows, shading devices, sills, related flashing, and caulking were inspected (as accessibility allowed) for signs of moisture, air leakage, and other issues. Overall, the windows were found to be in good condition with no signs of uncontrolled moisture, air leakage, and other energy-compromising issues.

Interior lighting in the facility is provided mainly by linear T8 fluorescent lamps and fixtures. There are other small areas that are lit with compact fluorescent lamps and T5 fluorescent lamps. The lighting in the building is controlled predominantly by light switches located on the walls near entry doors to rooms. The facility's HVAC system consists of five (5) individual direct expansion constant volume Trane packaged roof top units and two (2) Lochinvar hot water boilers.

A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC recommended eight (8) measures which together represent an opportunity for the Jersey City Municipal Courthouse to reduce annual energy costs by roughly $31,126 and annual greenhouse gas emissions by 255,866 lbs CO^2e. The measures pay for themselves in roughly 3.13 years. The breakdown of existing and potential utility costs is illustrated in Figure 1 and Figure 2, respectively. These combined measures will reduce Municipal Courthouse's annual energy usage by 21%.

Figure 1: Previous 12 Month Utility Costs

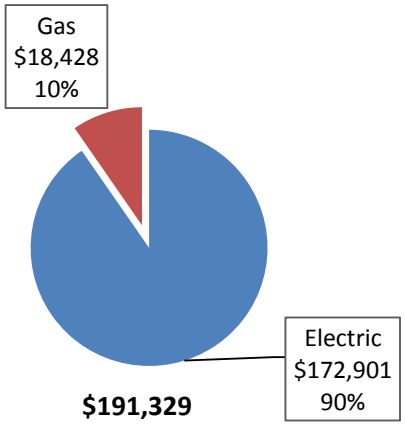
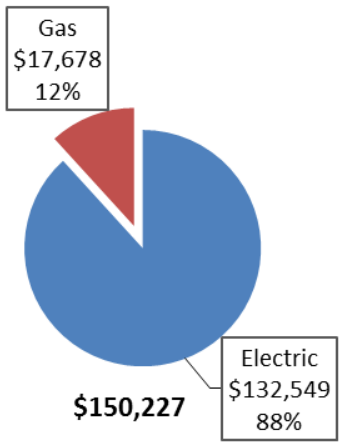


Figure 2: Potential Post-Implementation Costs



A detailed description of Municipal Courthouse's existing energy use can be found in Section 3.

The evaluated measures have been listed and grouped into major categories as shown in Figure 3. Brief descriptions of the categories can be found below and descriptions of the individual opportunities can be found in Section 4.

Figure 3: Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**192,195**	**43.3**	**0.0**	**$23,957.19**	**$91,868.54**	**$12,060.00**	**$79,808.54**	**3.33**	**193,539**
ECM 1	Install LED Fixtures	Yes	38,194	10.4	0.0	$4,760.89	$31,499.75	$1,500.00	$29,999.75	6.30	38,461
ECM 2	Retrofit Fixtures with LED Lamps	Yes	153,051	32.7	0.0	$19,077.84	$59,078.13	$10,560.00	$48,518.13	2.54	154,121
ECM 3	Install LED Exit Signs	Yes	950	0.1	0.0	$118.45	$1,290.66	$0.00	$1,290.66	10.90	957
Lighting Control Measures			**39,489**	**8.7**	**0.0**	**$4,922.36**	**$15,464.00**	**$3,080.00**	**$12,384.00**	**2.52**	**39,765**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	38,351	8.2	0.0	$4,780.48	$13,572.00	$2,340.00	$11,232.00	2.35	38,619
ECM 5	Install Daylight Dimming Controls	Yes	1,138	0.5	0.0	$141.87	$500.00	$500.00	$0.00	1.76	1,146
Variable Frequency Drive (VFD) Measures			**10,062**	**1.7**	**0.0**	**$1,254.27**	**$3,807.95**	**$0.00**	**$3,807.95**	**3.04**	**10,133**
ECM 6	Install VFDs on Hot Water Pumps	Yes	10,062	1.7	0.0	$1,254.27	$3,807.95	$0.00	$3,807.95	3.04	10,133
Domestic Water Heating Upgrade			**0**	**0.0**	**89.3**	**$749.52**	**$114.72**	**$0.00**	**$114.72**	**0.15**	**10,460**
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	89.3	$749.52	$114.72	$0.00	$114.72	0.15	10,460
Plug Load Equipment Control - Vending Machine			**1,954**	**0.0**	**0.0**	**$243.61**	**$1,437.60**	**$0.00**	**$1,437.60**	**5.90**	**1,968**
ECM 8	Vending Machine Control	Yes	1,954	0.0	0.0	$243.61	$1,437.60	$0.00	$1,437.60	5.90	1,968
TOTALS			**243,701**	**53.7**	**89.3**	**$31,126.95**	**$112,692.81**	**$15,140.00**	**$97,552.81**	**3.13**	**255,866**

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Lighting Upgrades generally involve the replacement of existing lighting components such as lamps and ballasts (or the entire fixture) with higher efficiency lighting components. These measure save energy by reducing the power used by the lighting components due to improved electrical efficiency.

Lighting Controls measures generally involve the installation of automated controls to turn off lights or reduce light output when conditions allow. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

Motor Upgrades generally involve replacing old standard efficiency motors with motors of the current efficiency standard (EISA 2007). Motors will be replaced with the same size motors. This measure saves energy by reducing the power used by the motors due to improved electrical efficiency.

Variable Frequency Drives measures generally involve controlling the speed of a motor to achieve a flow or temperature rather than using a valve, damper, or no means at all. These measures save energy by slowing a motor which is an extremely efficient method of control.

Domestic Hot Water Heating system upgrade measures generally involve replacing old inefficient domestic hot water heating systems with modern energy efficient systems, or upgrades to the system that reduce overall hot water usage. Domestic water heating systems upgrades can provide equivalent or greater capacity and performance, but use less energy. These measures save energy by reducing the fuel used by the domestic water heating systems due to improved efficiency or the removal of standby losses.

Plug Load Equipment control measures generally involve installing automation that limits the power use or operation of equipment plugged into an electrical receptacle based on occupancy.

Energy Efficient Practices

TRC also identified 15 low (or no) cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral and operational adjustments, as well as performing routine maintenance, on building systems. Through these practices, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and annual energy, operation, and maintenance costs can be reduced. Opportunities identified for the Municipal Courthouse include:

- Reduce Air Leakage
- Close Doors and Windows
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Perform Routine Motor Maintenance
- Use Fans to Reduce Cooling Load
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Check for and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Water Heater Maintenance
- Install Plug Load Controls
- Water Conservation

For details on these energy efficient practices, please refer to Section 5.

On-Site Generation Measures

TRC evaluated the potential for installing self-generation sources for Municipal Courthouse. Based on the configuration of the site and its loads there is a high potential for installing a photovoltaic (PV) array.

Figure 4: Photovoltaic Potential

Potential	High	
System Potential	86	kW DC STC
Electric Generation	102,458	kWh/yr
Displaced Cost	$8,910	/yr
Installed Cost	$223,600	

For details on our evaluation and the self-generation potential, please refer to Section 6.

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, a project implementation plan must be developed. Available capital must be considered and decisions need to be made whether it is best to pursue individual ECMs separately, groups of ECMs, or a comprehensive approach where all ECMs are implemented together, possibly in conjunction with other facility upgrades or improvements.

Rebates, incentives, and financing are available from NJCEP, as well as other sources, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any measure, please review the relevant incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives prior to purchasing materials or commencing with the installation.

The ECMs outlined in this report may qualify under the following program(s):

- SmartStart
- Pay for Performance - Existing Building (P4P EB)
- Energy Savings Improvement Program (ESIP)

For facilities wanting to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate in this program you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SS incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 4**Error! Reference source not found.** are based on the SmartStart program. More details on this program and others are available in Section 8.

Larger facilities interested in maximizing potential savings for their building should consider participating in the Pay for Performance (P4P) program. P4P offers the opportunity for a deeper whole building analysis of building systems. This program has minimum savings requirements and the incentives are based on actual measured performance savings. The application process is more detailed and requires working with an eligible contractor who is an approved P4P program partner, but it may result in more lucrative incentives up to 50% of total project cost.

For facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.3 for additional information on the ESIP Program.

Additional descriptions of all relevant incentive programs are located in Section 8 or: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 1: Project Contacts

Name	Role	E-Mail	Phone #
Customer			
John Mercer	Assistant Business Administrator	jmercer@jcnj.org	201-547-4417
Designated Representative			
Beny Rodriguez	Facility Maintenance Personnel		201-284-2484
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutions.com	732-855-2879

2.2 General Site Information

On July 13, 2016, TRC performed an energy audit at Municipal Courthouse located in Jersey City, New Jersey. TRC's auditor met with Beny Rodriguez to review the facility operations and focus the investigation on specific energy-using systems.

The Jersey City Municipal Courthouse is a 60,000 square foot facility comprised of various space types. The Municipal Court is a statutory court that is responsible for hearing motor vehicle traffic violations and disorderly and petty disorderly criminal offenses within the jurisdiction of the municipality. Construction of the facility was completed in 2000. The building is three (3) floors (including the basement) and includes courtrooms, offices, conference rooms, police personnel rooms, holding cells, garage, and the basement mechanical space. Typically, 100 to 400 people occupy the facility during normal operating hours. After-hours occupancy consists of approximately 50 people. The scheduled occupancy for the six courtrooms varies throughout the week.

2.3 Building Occupancy

Typically, 100 to 400 people occupy the facility during normal operating hours. After-hours occupancy typically consists of approximately 50 people. The typical schedule is presented in the table below.

Figure 2: Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Jersey City Minicipal Court House	Weekday	8:30 AM - 9:30 PM
Jersey City Minicipal Court House	Weekend	N/A

2.4 Building Envelope

The foundation systems include reinforced concrete column pads. Exterior walls are finished with a brick masonry. The building has a flat roof covered with a multi-ply bituminous built-up membrane that is in good condition. The building's base and its perimeter were inspected for signs of uncontrolled moisture or water presence and other energy-compromising issues. Overall the base was reported to be in good condition with no apparent signs of leakage.

The windows are glazed with insulated panes set in metal frames. The front windows are part of an aluminum-framed storefront system incorporating the entry doors. The entrance doors are fully glazed, framed in aluminum and set in the storefront framing system. Windows, shading devices, sills, related flashing and caulking were inspected and overall, they were found to be in good condition.

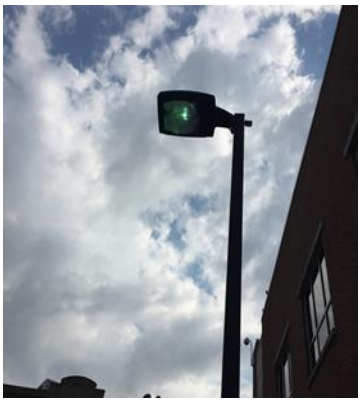
2.5 On-site Generation

The Jersey City Municipal Courthouse has a backup generator which was not accessible during the field audit.

2.6 Energy-Using Systems

Lighting System

The facility lighting system consists mainly of linear 32-Watt fluorescent T8 lamps with a mix of electronic and magnetic ballasts. Most of the building spaces use 2-lamp or 3-lamp, 4-foot troffers with diffuser lenses.



In some areas compact fluorescent lamps (CFL) are providing space lighting. Hallways, offices, and common areas are lit with T8 fluorescent lamps. The main lobby and the courtrooms are lit with recessed CFLs (2 lamp, 26 Watts each). The courtrooms also have chandelier fixtures (4 lamp, 13 Watts CFLs). Two foot, U-bend, 32 Watts T8 fixtures are also found scattered throughout the building.

The lighting in the building is controlled predominantly by manual switches that are typically located near entryways. Occupancy sensors are recommended for optimum control of interior lighting in most rooms to ensure lights are turned off in unoccupied rooms. Exterior building and site illumination is provided by surface-mounted light fixtures on the exterior walls. Recessed light fixtures are located in the exterior soffits.

Exterior lighting is currently scheduled to remain on from 6:00 PM through 6:00 AM, although the timer is likely faulty, or scheduled incorrectly. It was observed that several exterior lights were on when scheduled to be off. To improve energy efficiency and building security, we recommend that timers for all exterior lighting be checked and adjusted.

Significant energy saving could be achieved by replacing the existing lighting system with LED linear tubes and LED lamps fixtures. Installing occupancy sensors in select areas will yield additional energy savings.

Please refer to Appendix A Equipment Inventory & Recommendations for an inventory of your equipment.

Hot Water / Steam System

The heating hot water system consists of two (2) Lochinvar 1,017 kBtu/hr output, non-condensing boilers. The boilers have a nominal combustion efficiency of 81% and operate in lead/lag with only one operating at a time. Each boiler has a five (5) HP circulating pump motor equipped with a variable frequency drive (VFD).

The boilers are configured in a variable flow for primary distribution. Circulating pumps provide hot water to each temperature-controlled space by a two-pipe distribution system. The hot water is supplied to the baseboard heaters and variable air volume (VAV) terminal units. Sixteen (16) wall/cabinet Trane water unit heaters are located throughout the building for supplemental heat. The boilers appeared to be in good condition overall.

Air Conditioning (DX)

There are a total of five (5) rooftop units that provide heating and cooling in the common areas. They are all Trane direct expansion (DX) constant volume packaged units. They range from 20 to 90 tons and use R-22 as a refrigerant. Air distribution is provided in order to supply air registers using ducts concealed above the ceilings. Return air grilles are located in each space. Heated and/or cooled air is distributed

through ducts to variable air volume (VAV) terminals concealed above the ceilings in each common area and tenant space. Cooling in the data room is provided by two (2) 0.75 ton Samsung split-system air conditioning units. The heating and cooling systems are controlled by local thermostats.

During the field audit, we met on the building's roof with an outside contractor who was providing service to HVAC equipment and adjusting temperature set points. He mentioned that the HVAC system has no serious issues overall and is just in need of routine maintenance.

Bathrooms and other areas are ventilated by Loren Cook mechanical exhaust fans mounted on the roof and connected by concealed ducts to each ventilated space.

Building Energy Management System

We did not see a building energy management system in the facility during the field audit. We recommend the facility consider installation of a building energy management system (BEMS) to better maintain HVAC system performance and control energy costs through improved system scheduling.

We heard from occupants in several office areas that their areas were routinely too cold or too hot. We observed several areas where vents were taped up by occupants or windows were open to regulate temperature. These practices waste a lot of energy. These are signs that the building's HVAC system is not properly balanced. Installing a BMS system would help alleviate these comfort issues by providing better control of temperature set points in each area.

Domestic Hot Water

The domestic hot water system for the facility consists of two (2) A. O. Smith gas-fired, non-condensing hot water heaters each with an input rating of 199 kBtu/hr and a nominal efficiency of 80%. The water heaters each have a capacity of 100 gallons and appear to be in good condition. The two (2) hot water heaters are located in the boiler room.

Plug load & Vending Machines

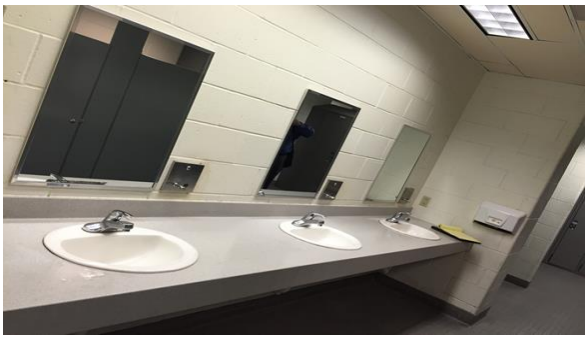
There are roughly 123 computer work stations throughout the facility and about 99% of the computers are desktop units with LCD monitors. We counted 44 printers and copiers and one digital photographic machine in the facility.

There is one data center and several data hubs scattered throughout the facility. The data center has cooling provided by a dedicated split system.

The facility has one refrigerated beverage and one non-refrigerated vending machines located in the lunch room.

2.7 Water-Using Systems

There are several restrooms at this facility. A sampling of common area restrooms found that faucets are rated for 2.5 gallons per minute (gpm), the toilets are rated at 1.6 gallons per flush, and the urinals are rated at 2 gpf.



3 SITE ENERGY USE AND COSTS

Utility data for electricity and natural gas was analyzed to identify opportunities for savings. In addition, data for electricity and natural gas was evaluated to determine the annual energy performance metrics for the building in energy cost per square foot and energy usage per square foot. These metrics are an estimate of the relative energy efficiency of this building. There are a number of factors that could cause the energy use of this building to vary from the typical energy usage profile for facilities with similar characteristics. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and energy efficient behavior of occupants all contribute to benchmarking scores. Please refer to the Benchmarking section within Section 3.4for additional information.

3.1 Total Cost of Energy

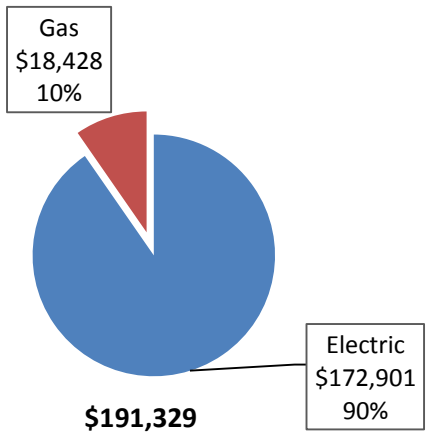
The following energy consumption and cost data are based on the most recent 12-month period of utility billing data that was available. A profile of the annual energy consumption and costs for the facility was developed from this information.

Figure 1: Utility Summary

Utility Summary for Municipal Courthouse		
Fuel	**Usage**	**Cost**
Electricity	1,299,843 kWh	$172,901
Natural Gas	21,965 Therms	$18,428
Total		**$191,329**

The current utility cost for this site is $191,329 as shown in the chart below.

Figure 2: Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost over the past 12 months was $0.125/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 3: Electric Usage & Demand

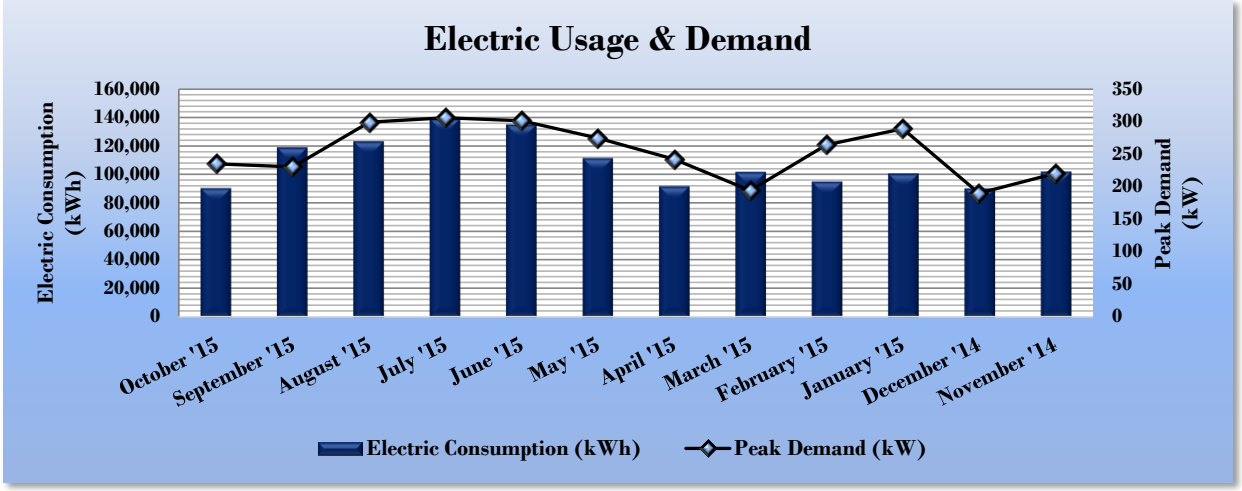


Figure 4: Electric Usage & Demand

Electric Billing Data for Municipal Courthouse					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
11/2/15	31	90,528	235	$853	$10,973
10/2/15	30	118,932	230	$1,197	$14,715
9/2/15	29	123,304	299	$1,079	$17,758
8/4/15	29	139,103	306	$1,103	$20,221
7/6/15	32	135,062	301	$1,086	$19,735
6/4/15	30	111,461	275	$990	$16,577
5/5/15	29	91,696	242	$873	$11,656
4/6/15	32	101,772	194	$701	$12,828
3/5/15	30	95,108	264	$734	$12,004
2/4/15	29	100,582	289	$785	$12,494
1/5/15	31	90,295	190	$683	$11,364
12/3/14	33	102,000	220	$792	$12,577
Totals	**365**	**1,299,843**	**306**	**$10,876**	**$172,901**
Annual	**365**	**1,299,843**	**306**	**$10,876**	**$172,901**

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is $0.839/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 5: Natural Gas Usage

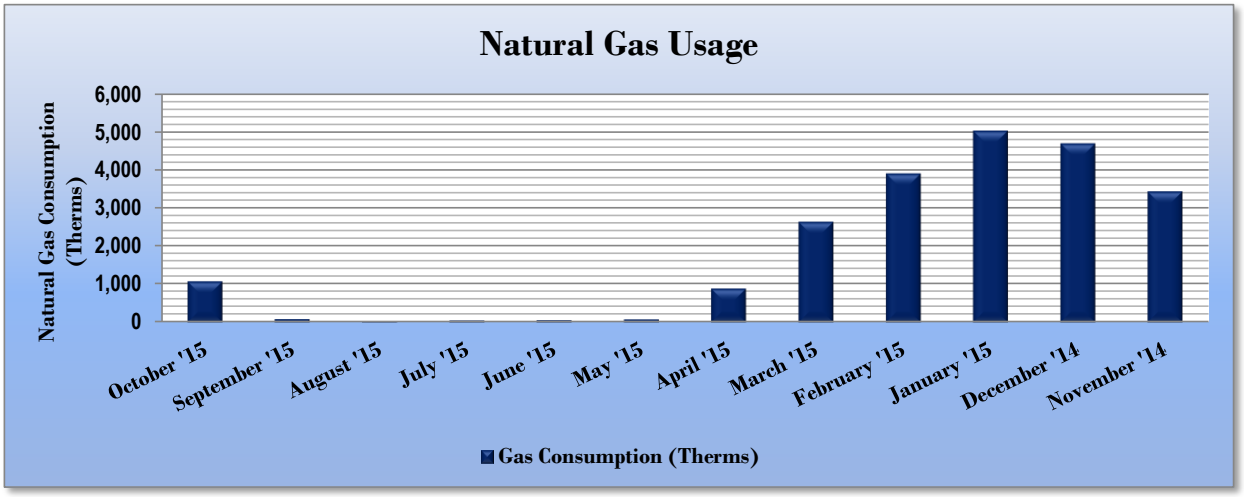


Figure 6: Natural Gas Usage

Gas Billing Data for Municipal Courthouse			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
11/6/15	31	1,079	$879
10/8/15	30	83	$153
9/9/15	29	36	$125
8/10/15	29	49	$132
7/10/15	32	57	$136
6/10/15	30	78	$147
5/11/15	29	884	$598
4/10/15	32	2,641	$1,649
3/11/15	30	3,903	$2,752
2/4/15	33	5,028	$4,676
1/5/15	30	4,691	$3,941
12/3/14	30	3,435	$3,240
Totals	**365**	**21,965**	**$18,428**
Annual	**365**	**21,965**	**$18,428**

3.4 Benchmarking

This facility was benchmarked using Portfolio Manager, an online tool created and managed by the United States Environmental Protection Agency (EPA) through the ENERGY STAR® program. Portfolio Manager analyzes your building's consumption data, cost information, and operational use details and then compares its performance against a national median for similar buildings of its type. Metrics provided by this analysis are Energy Use Intensity (EUI) and an ENERGY STAR® score for select building types.

The EUI is a measure of a facility's energy consumption per square foot, and it is the standard metric for comparing buildings' energy performance. Comparing the EUI of a building with the national median EUI for that building type illustrates whether that building uses more or less energy than similar buildings of its type on a square foot basis. EUI is presented in terms of site energy and source energy. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

Figure 7: Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Municipal Courthouse	National Median Building Type: Municipal
Source Energy Use Intensity (kBtu/ft^2)	270.5	148.1
Site Energy Use Intensity (kBtu/ft^2)	110.5	67.3

Implementation of all recommended measures in this report would improve the building's estimated EUI significantly, as shown in the table below:

Figure 8: Energy Use Intensity Comparison – Following Installation of Recommended Measures

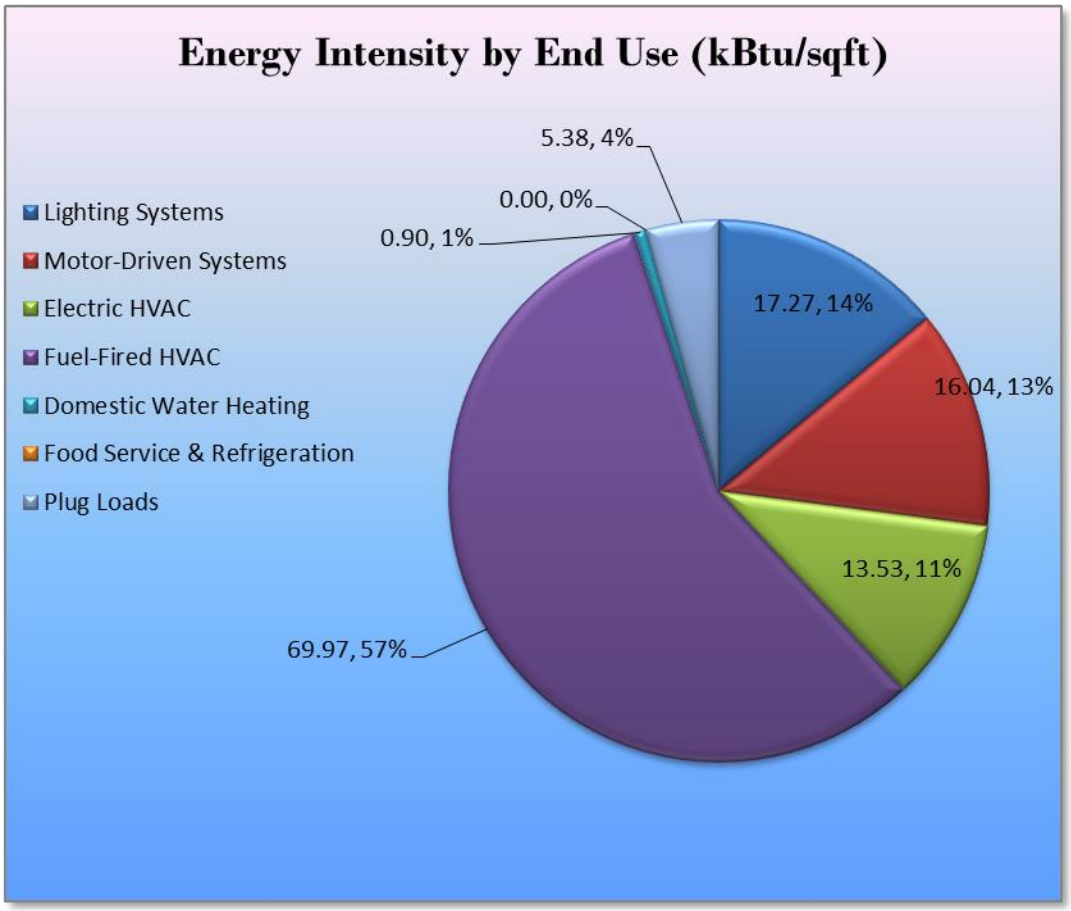
Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Municipal Courthouse	National Median Building Type: Municipal
Source Energy Use Intensity (kBtu/ft^2)	225.5	148.1
Site Energy Use Intensity (kBtu/ft^2)	95.2	67.3

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. Your building's current score is 43. A Portfolio Manager "Statement of Energy Performance" was developed for this site and can be found in Appendix B: ENERGY STAR® Statement of Energy Performance.

3.5 Energy End-Use Breakdown

In order to provide a complete overview of energy consumption across building systems, an energy balance was performed at this facility. An energy balance utilizes standard practice engineering methods to evaluate all components of the various electric and fuel-fired systems found in a building and determine their proportional contribution to overall building energy usage. This visual representation of energy end uses highlights systems that may benefit most from energy efficiency projects.

Figure 9: Energy Balance (kBtu/ft² and %)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation and provide information to the Municipal Courthouse regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016, approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the recommended measures.

4.1 Recommended ECMs

The measures below have been evaluated by the auditor and are recommended for implementation at the facility.

Figure 1: Summary of Recommended ECMs

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**192,195**	**43.3**	**0.0**	**$23,957.19**	**$91,868.54**	**$12,060.00**	**$79,808.54**	**3.33**	**193,539**
ECM 1	Install LED Fixtures	Yes	38,194	10.4	0.0	$4,760.89	$31,499.75	$1,500.00	$29,999.75	6.30	38,461
ECM 2	Retrofit Fixtures with LED Lamps	Yes	153,051	32.7	0.0	$19,077.84	$59,078.13	$10,560.00	$48,518.13	2.54	154,121
ECM 3	Install LED Exit Signs	Yes	950	0.1	0.0	$118.45	$1,290.66	$0.00	$1,290.66	10.90	957
Lighting Control Measures			**39,489**	**8.7**	**0.0**	**$4,922.36**	**$15,464.00**	**$3,080.00**	**$12,384.00**	**2.52**	**39,765**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	38,351	8.2	0.0	$4,780.48	$13,572.00	$2,340.00	$11,232.00	2.35	38,619
ECM 5	Install Daylight Dimming Controls	Yes	1,138	0.5	0.0	$141.87	$500.00	$500.00	$0.00	1.76	1,146
Variable Frequency Drive (VFD) Measures			**10,062**	**1.7**	**0.0**	**$1,254.27**	**$3,807.95**	**$0.00**	**$3,807.95**	**3.04**	**10,133**
ECM 6	Install VFDs on Hot Water Pumps	Yes	10,062	1.7	0.0	$1,254.27	$3,807.95	$0.00	$3,807.95	3.04	10,133
Domestic Water Heating Upgrade			**0**	**0.0**	**89.3**	**$749.52**	**$114.72**	**$0.00**	**$114.72**	**0.15**	**10,460**
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	89.3	$749.52	$114.72	$0.00	$114.72	0.15	10,460
Plug Load Equipment Control - Vending Machine			**1,954**	**0.0**	**0.0**	**$243.61**	**$1,437.60**	**$0.00**	**$1,437.60**	**5.90**	**1,968**
ECM 8	Vending Machine Control	Yes	1,954	0.0	0.0	$243.61	$1,437.60	$0.00	$1,437.60	5.90	1,968
TOTALS			**243,701**	**53.7**	**89.3**	**$31,126.95**	**$112,692.81**	**$15,140.00**	**$97,552.81**	**3.13**	**255,866**

* - All incentives presented in this table are based on NJ Smart Start Building equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

4.1.1 Lighting Upgrades

Recommended lighting upgrades are summarized in Figure 17 below.

Figure 2: Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**192,195**	**43.3**	**0.0**	**$23,957.19**	**$91,868.54**	**$12,060.00**	**$79,808.54**	**3.33**	**193,539**
ECM 1	Install LED Fixtures	Yes	38,194	10.4	0.0	$4,760.89	$31,499.75	$1,500.00	$29,999.75	6.30	38,461
ECM 2	Retrofit Fixtures with LED Lamps	Yes	153,051	32.7	0.0	$19,077.84	$59,078.13	$10,560.00	$48,518.13	2.54	154,121
ECM 3	Install LED Exit Signs	Yes	950	0.1	0.0	$118.45	$1,290.66	$0.00	$1,290.66	10.90	957

ECM 1: Install LED Fixtures

Summary of Measure Economics

Figure 3: LED Fixtures Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	27,351	5.8	0.0	$3,409.27	$14,703.38	$0.00	$14,703.38	4.31	27,542
Exterior	10,843	4.6	0.0	$1,351.62	$16,796.37	$1,500.00	$15,296.37	11.32	10,919

Measure Description

We recommend replacing existing fluorescent, incandescent, and HID fixtures with new high-performance LED light fixtures. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of fluorescent tubes and more than ten times longer than many incandescent lamps.

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Figure 4: LED Lamps Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	152,383	32.5	0.0	$18,994.53	$58,596.13	$10,460.00	$48,136.13	2.53	153,448
Exterior	668	0.3	0.0	$83.32	$482.00	$100.00	$382.00	4.58	673

Measure Description

We recommend retrofitting existing fluorescent fixtures by removing fluorescent tubes and ballasts and replacing them with LEDs and LED drivers (if necessary), which are designed to be used retrofitted fluorescent fixtures. The measure uses the existing fixture housing but replaces the rest of the components with more efficient lighting technology. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of fluorescent tubes and more than ten times longer than many incandescent lamps.

ECM 3: Install LED Exit Signs

Summary of Measure Economics

Figure 5: LED Exit Signs Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	950	0.1	0.0	$118.45	$1,290.66	$0.00	$1,290.66	10.90	957
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	0

Measure Description

We recommend replacing compact fluorescent lighting in exit signs with LEDs. LEDs require virtually no maintenance and LED exit signs have a life expectancy of at least 20 years. Exit signs are on 24 hours per day, so even the low wattage bulbs in them consume significant power over time. Upgrading them all to LED exit signs improves energy efficiency and fire safety. A reduction in maintenance costs may also result from the proposed retrofit because lamps will not have to be replaced as frequently.

4.1.2 Lighting Control Measures

Recommended lighting control measures are summarized in Figure 21 below.

Figure 6: Summary of Lighting Control ECMs

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures			**39,489**	**8.7**	**0.0**	**$4,922.36**	**$15,464.00**	**$3,080.00**	**$12,384.00**	**2.52**	**39,765**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	38,351	8.2	0.0	$4,780.48	$13,572.00	$2,340.00	$11,232.00	2.35	38,619
ECM 5	Install Daylight Dimming Controls	Yes	1,138	0.5	0.0	$141.87	$500.00	$500.00	$0.00	1.76	1,146

ECM 4: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Figure 7: Occupancy Sensor Controls Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
41,256	8.8	0.0	$5,142.55	$14,964.00	$2,580.00	$12,384.00	2.41	41,544

Measure Description

We recommend installing occupancy sensors to control light fixtures that are currently manually controlled in restrooms, hallways, and private offices. Sensors detect occupancy using ultrasonic and/or infrared technologies. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Occupants will also be able to manually turn off fixtures. Energy savings result from only operating lighting systems when they are required.

Occupancy sensors may be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. Ceiling-mounted or remote-mounted sensors require the use of low voltage switching relays or a wireless signal to the switch. In general, use wall switch replacement sensors for single occupant offices and other small rooms. Install ceiling-mounted or remote mounted sensors in locations without local switching, in situations where the existing wall switches are not in the line-of-sight of the main work area, and in large spaces. During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 5: Install Daylight Dimming Controls

Summary of Measure Economics

Figure 8: Daylight Dimming Controls Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,138	0.5	0.0	$141.87	$500.00	$500.00	$0.00	1.76	1,146

Measure Description

We recommend installing indoor photo sensor controls to dim or turn off lights in areas that receive sufficient daylight during certain hours of the day. Photo sensor control is recommended for fixtures that are located adjacent to window spaces with ample daylight. Lighting controls should be capable of continuous or at least four steps of dimming. This measure would reduce energy use by fixtures in spaces when appropriate light levels are met via daylight.

Optimum light levels and the method of dimming should be determined during the design phase of this project. We recommend a comprehensive lighting design approach that considers both the lighting technology and how they are controlled.

4.1.3 Variable Frequency Drive Measures

Recommended variable frequency drive (VFD) measures are summarized in Figure 24 below.

Figure 9: Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade			**0**	**0.0**	**89.3**	**$749.52**	**$114.72**	**$0.00**	**$114.72**	**0.15**	**10,460**
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	89.3	$749.52	$114.72	$0.00	$114.72	0.15	10,460

ECM 6: Install VFDs on Hot Water Pumps

Summary of Measure Economics

Figure 10: Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
10,062	1.7	0.0	$1,254.27	$3,807.95	$0.00	$3,807.95	3.04	10,133

Measure Description

We recommend installing a variable frequency drive (VFD) to control a hot water pump. This measure requires that a majority of the hot water coils be served by 2-way valves and that a differential pressure sensor is installed in the hot water loop. As the hot water valves close, the differential pressure increases. The VFD modulates pump speed to maintain a differential pressure setpoint. Energy savings result from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the amount of time at reduced loads.

4.1.4 Domestic Hot Water Heating System Upgrade

Recommended domestic hot water heating system upgrades are summarized in Figure 26 below.

Figure 11: Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade			**0**	**0.0**	**89.3**	**$749.52**	**$114.72**	**$0.00**	**$114.72**	**0.15**	**10,460**
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	89.3	$749.52	$114.72	$0.00	$114.72	0.15	10,460

ECM 7: Install Low-Flow DHW Devices

Figure 12: Install Low-Flow DHW Devices

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	89.3	$749.52	$114.72	$0.00	$114.72	0.15	10,460

Measure Description

We recommend installing low flow domestic water devices to reduce overall water flow rates to reduce hot water usage. Low flow faucet aerators reduce water flow rates. Low-flow devices reduce the amount of hot water used annually resulting in energy and water savings. The flow ratings for EPA WaterSense™ (http://www3.epa.gov/watersense/products) labeled devices are 1.5 gpm for bathroom faucets, 2.0 gpm for showerheads, and 1.28 gpm for pre-rinse spray valves.

4.1.5 Plug Load Equipment Control - Vending Machine

ECM 8: Vending Machine Control

Summary of Measure Economics

Figure 13: Vending Machine Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,954	0.0	0.0	$243.61	$1,437.60	$0.00	$1,437.60	5.90	1,968

Measure Description

Vending machines operate continuously, even during non-business hours. We recommend to installing occupancy sensor based controls (called “Vending Misers”) to reduce their energy usage. These controls power down the machine when the surrounding area is vacant, then monitor the surrounding temperature and power up the cooling system at regular intervals to keep the product cool. Savings are a function of the activity level around the vending machine.

5 ENERGY EFFICIENT PRACTICES

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through application of low (or no)cost efficiency strategies. By employing certain behavioral and operational adjustments as well as performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and annual energy, operation, and maintenance costs can be reduced. The recommendations below are provided as a framework for developing a whole building maintenance plan that is customized to your facility. Consult with qualified equipment specialists for details on proper maintenance and system operation.

Reduce Air Leakage

Air leakage, or infiltration, occurs when outside air enters a building uncontrollably through cracks and openings. Properly sealing such cracks and openings can significantly reduce heating and cooling costs, improve building durability, and create a healthier indoor environment. This includes caulking or installing weather stripping around leaky doors and windows allowing for better control of indoor air quality through controlled ventilation.

Close Doors and Windows

Ensure doors and windows are closed in conditioned spaces. Leaving doors and windows open leads to a significant increase in heat transfer between conditioned spaces and the outside air. Reducing a facility's air changes per hour (ACH) can lead to increased occupant comfort as well as significant heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

Perform Proper Lighting Maintenance

In order to sustain optimal lighting levels, lighting fixtures should undergo routine maintenance. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust on lamps, fixtures, and reflective surfaces. Together, these factors can reduce total illumination by 20% - 60% or more, while operating fixtures continue drawing full power. To limit this reduction, lamps, reflectors and diffusers should be thoroughly cleaned of dirt, dust, oil, and smoke film buildup approximately every 6 – 12 months.

Develop a Lighting Maintenance Schedule

In addition to routine fixture cleaning, development of a maintenance schedule can both ensure maintenance is performed regularly and can reduce the overall cost of fixture re-lamping and re-ballasting. By re-lamping and re-ballasting fixtures in groups, lighting levels are better maintained and the number of site visits by a lighting technician or contractor can be minimized, decreasing the overall cost of maintenance.

Ensure Lighting Controls Are Operating Properly

Lighting controls are very cost effective energy efficient devices when installed and operating correctly. As part of a lighting maintenance schedule, lighting controls should be tested annually to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight sensors, maintenance involves cleaning of sensor lenses and confirming setpoints and sensitivity are appropriately configured.

Perform Routine Motor Maintenance

Motors consist of many moving parts whose collective degradation can contribute to a significant loss of motor efficiency. In order to prevent damage to motor components, routine maintenance should be performed. This maintenance consists of cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Use Fans to Reduce Cooling Load

Utilizing ceiling fans to supplement cooling is a low-cost strategy to reduce cooling load considerably. Thermostat settings can be increased by 4°F with no change in overall occupant comfort when the wind chill effect of moving air is employed for cooling.

Practice Proper Use of Thermostat Schedules and Temperature Resets

Ensure thermostats are correctly set back. By employing proper set back temperatures and schedules, facility heating and cooling costs can be reduced dramatically during periods of low or no occupancy. As such, thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced further by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

Clean Evaporator/Condenser Coils on AC Systems

Dirty evaporators and condensers coils cause a restriction to airflow and restrict heat transfer. This results in increased evaporator and condenser fan load and a decrease in cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

Clean and/or Replace HVAC Filters

Air filters work to reduce the amount of indoor air pollution and increase occupant comfort. Over time, filters become less and less effective as particulate buildup increases. In addition to health concerns related to clogged filters, filters that have reached saturation also restrict air flow through the facility's air conditioning or heat pump system, increasing the load on the distribution fans and decreasing occupant comfort levels. Filters should be checked monthly and cleaned or replaced when appropriate.

Check for and Seal Duct Leakage

Duct leakage in commercial buildings typically accounts for 5% to 25% of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building, significantly increasing cooling and heating costs. By sealing sources of leakage, cooling, heating, and ventilation energy use can be reduced significantly, depending on the severity of air leakage.

Perform Proper Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance are essential to retain proper functionality and efficiency of the heating system. Fuel burning equipment should undergo yearly tune-ups to ensure they are operating as safely and efficiently as possible from a combustion standpoint. A tune-up should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Buildup of dirt, dust, or deposits on the internal surfaces of a boiler can greatly affect its heat transfer efficiency. These deposits can accumulate on the water side or fire side

of the boiler. Boilers should be cleaned regularly according to the manufacturer's instructions to remove this build up in order to sustain efficiency and equipment life.

Perform Proper Water Heater Maintenance

At least once a year, drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Once a year check for any leaks or heavy corrosion on the pipes and valves. For gas water heaters, check the draft hood and make sure it is placed properly, with a few inches of air space between the tank and where it connects to the vent. Look for any corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional. For electric water heaters, look for any signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank. For water heaters over three (3) to four (4) years old have a technician inspect the sacrificial anode annually.

Plug Load Controls

There are a variety of ways to limit the energy use of plug loads including increasing occupant awareness, removing under-utilized equipment, installing hardware controls, and using software controls. Some control steps to take are to enable the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips.

Water Conservation

Installing dual flush or low flow toilets and low-flow or waterless urinals are additional ways to reduce the sites water use, however, these devices do not provide energy savings at the site level. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and toilets that use as little as 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

Refer to Section 4.1.4 for any low-flow ECM recommendations.

6 On-Site Generation Measures

On-site generation measure options include both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) on-site technologies that generate power to meet all or a portion of the electric energy needs of a facility, often repurposing any waste heat where applicable. Also referred to as distributed generation, these systems contribute to Greenhouse Gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, resulting in the electric system reliability through improved transmission and distribution system utilization.

The State of New Jersey's Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines a goal of 70% of the State's electrical needs to be met by renewable sources by 2050.

Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

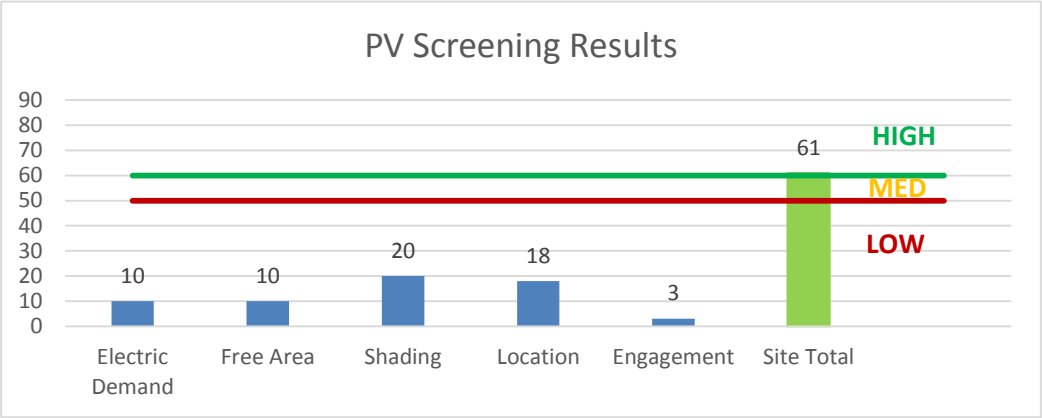
6.1 Photovoltaic

Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility's electrical distribution system. The amount of unobstructed area available determines how large of a solar array can be installed. The size of the array combined with the orientation, tilt, and shading elements determines the energy produced.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has a high potential for installing a solar PV array.

In order to be cost-effective, a solar PV array generally needs a flat or south-facing rooftop, or other unshaded space, on which to place the PV panels. In our opinion, the facility may meet these minimum criteria for cost-effective solar PV installation.

Figure 1: Photovoltaic Screening



Potential	High	
System Potential	86	kW DC STC
Electric Generation	102,458	kWh/yr
Displaced Cost	$8,910	/yr
Installed Cost	$223,600	

Owners of solar projects MUST register their projects in the SREC Registration Program prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing. Refer to Section 8.3 for additional information.

For more information on solar PV technology and commercial solar markets in New Jersey, or to find a qualified solar installer, who can provide a more detailed assessment of the specific costs and benefits of solar develop of the site, please visit the following links below:

- **Basic Info on Solar PV in NJ**: http://www.njcleanenergy.com/whysolar
- **NJ Solar Market FAQs**: http://www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the NJ Market**: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

6.2 Combined Heat and Power

In non-industrial settings, combined heat and power (CHP) is the on-site generation of electricity and recovery of heat which is put to beneficial use. Common prime movers in CHP applications include reciprocating engines, microturbines, fuel cells, and (at large facilities) gas turbines. Electricity is typically interconnected to the sites local distribution system. Heat is recovered from the exhaust stream and the ancillary cooling system and interconnected to the existing hot water (or steam) distribution system.

CHP systems are typically used to produce a portion of the electricity needed by a facility, with the balance of electric needs satisfied by purchase from the grid. The heat is used to supplement (or

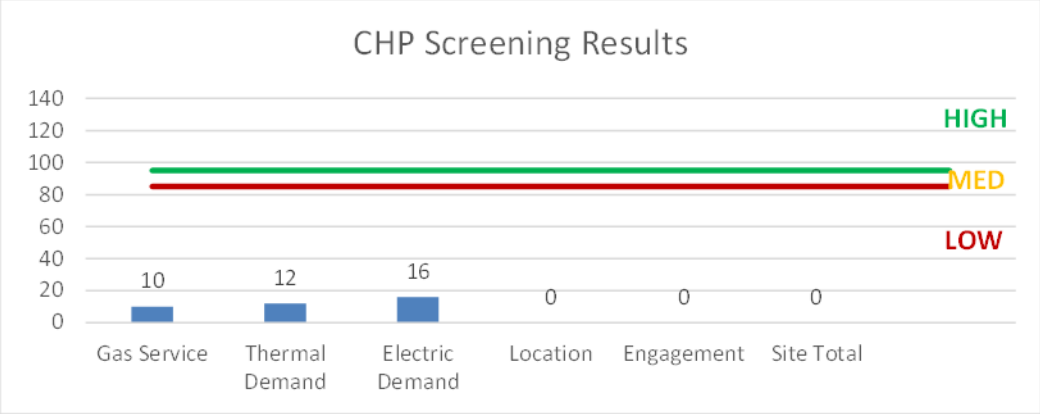
supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for the purpose of space cooling. The key criteria used for screening, however, is the amount of time the system operates at full load and the facility's ability to use the recovered heat. Facilities with continuous use for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has a low potential for installing a cost-effective CHP system.

Low and/or infrequent hot water demand is the main reason the site has a low potential for CHP installation. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

For more information and a list of qualified firms in NJ specializing in commercial CHP cost assessment and installation, go to: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

Figure 2: Combined Heat and Power Screening



7 DEMAND RESPONSE

Demand Response (DR) is a program designed to reduce consumer electric load when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. DR service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability locally.

By enabling grid operators to call upon Curtailment Service Providers and energy consumers to reduce electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and participants will receive payments whether or not their facility is called upon to curtail their load.

Typically an electric customer needs to be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with a greater capability to quickly curtail their demand during peak hours will receive higher payments. Customers with back-up generators onsite may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in a DR program often find it to be a valuable source of revenue for their facility or facilities because the payments can significantly offset annual utility costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature set points on thermostats so that air conditioning units run less frequently or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR event cycle. DR program participants often have to install smart meters and may need to also sub-meter larger energy-using equipment, such as chillers, in order to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a demand response activity in most situations.

The first step toward participation in a DR program is to contact a Curtailment Service Provider. Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding the program rules and requirements for metering and controls, a facility's ability to temporarily reduce electric load, as well as the payments involved in participating in the program. Also, these providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment to help ensure compliance of all terms and conditions of a DR contract.

Based on our analysis the Jersey City Municipal Courthouse, the building may not have sufficient electric load that could be curtailed, in order be able to participate in a DR program, but requirements vary and program eligibility should be confirmed with DR service provider.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and others, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay this charge on their monthly energy bills. As a contributor to the fund you were able to participate in the LGEA program and are also eligible to utilize the equipment incentive programs. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 31 for a list of the eligible programs identified for each recommended ECM.

Figure 1: ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Pay For Performance Existing Buildings
ECM 1	Install LED Fixtures	x		x
ECM 2	Retrofit Fixtures with LED Lamps	x		x
ECM 3	Install LED Exit Signs			x
ECM 4	Install Occupancy Sensor Lighting Controls	x		x
ECM 5	Install Daylight Dimming Controls	x		x
ECM 6	Premium Efficiency Motors			x
ECM 7	Install VFDs on Hot Water Pumps			x
ECM 8	Install Low-Flow Domestic Hot Water Devices			x
ECM 9	Vending Machine Control			x

SmartStart is generally well suited for implementation of individual or small sets of measures, with the flexibility to install projects at your own pace using in-house staff or a preferred contractor. The Pay for Performance (P4P) program is a "whole-building" energy improvement program designed for larger facilities and requires implementation of multiple measures meeting minimum savings thresholds, as well as the use of pre-approved consultants. The Large Energy Users Program (LEUP) is available to New Jersey's largest energy users giving them the flexibility to install as little or as many measures, in a single facility or several facilities, with incentives capped based on the entity's annual energy consumption; applicants can use in-house staff or preferred contractor.

Generally, the incentive values provided throughout the report assume the SmartStart program is utilized because it provides a consistent comparison of available incentives.

Brief descriptions of all relevant alternative financing and incentive programs are located in the sections below or: www.njcleanenergy.com/ci.

8.1 SmartStart

Overview

The SmartStart program is comprised of new construction and retrofit components that offer incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives for various energy efficiency equipment based on national/market trends, new technologies or changes in efficiency baselines.

Prescriptive Equipment Incentives Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

All customer sizes and types may be served by this program. This program provides an effective mechanism for securing incentives for individual projects that may be completed at once or over several years.

Incentives

The prescriptive path provides fixed incentives for specific energy efficiency measures whereas the custom measure path provides incentives for unique or specialized technologies that are not addressed through prescriptive offerings.

Since your facility is an existing building, only the retrofit incentives have been applied in this report. Custom Measure incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings, capped at the lesser of 50% of the total installed incremental project cost, or a buy down to a one-year payback. Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

To participate in the SmartStart program you will need to submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. Applicants may work with a contractor of their choosing and can also utilize internal personnel, which provides added flexibility to the program. Using internal personnel also helps improve the economics of the ECM by reducing the labor cost that is included in the tables in this report.

Detailed program descriptions, instructions for applying and applications can be found at: www.njcleanenergy.com/SSB.

8.2 Pay for Performance - Existing Buildings

Overview

The Pay for Performance – Existing Buildings (P4P EB) program is designed for larger customers with a peak demand over 200 kW in any of the preceding 12 months. Under this program, the minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings. P4P is a generally a good option for medium to large sized facilities looking to implement as many measures as possible under a single project in order to achieve deep energy savings. This program has an added benefit of evaluating a broad spectrum of measures that may not otherwise qualify under other programs. Many facilities pursuing ESIP also utilize the P4P program.

Incentives

Incentives are calculated based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

To participate in the P4B EB program you will need to contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, the Partner will help further evaluate the measures identified in this report through development of the Energy Reduction Plan (ERP), assist you in implementing selected measures, and verify actual savings one year after the installation. At each of these three milestones, your Partner will also facilitate securing program incentives.

Approval of the final scope of work is required by the program prior to installation completion. Although installation can be accomplished by a contractor of your choice (some P4P Partners are also contractors) or by internal personnel, the Partner must remain involved to ensure compliance with the program guidelines and requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: www.njcleanenergy.com/P4P.

8.3 SREC Registration Program

The SREC Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SRP prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar RPS. One way they can meet the RPS requirements is by purchasing SRECs. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period can and will fluctuate depending on supply and demand.

Information about the SRP can be found at: www.njcleanenergy.com/srec.

8.4 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) is an alternate method for New Jersey's government agencies to finance the implementation of energy conservation measures. An ESIP is a type of "performance contract," whereby school districts, counties, municipalities, housing authorities and other public and state entities enter into contracts to help finance building energy upgrades. This is done in a manner that ensures that annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive in year one, and every year thereafter. ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs can be leveraged to help further reduce the total project cost of eligible measures.

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an Energy Services Company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is utilized for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the Energy Savings Plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Entities should carefully consider all alternatives to develop an approach that best meets their needs. A detailed program description and application can be found at: www.njcleanenergy.com/ESIP.

Please note that ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you may utilize the incentive programs to help further reduce costs when compiling the ESP. You should refer to the ESIP guidelines at the link above for further information and guidance on next steps.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law deregulated the retail electric markets, allowing all consumers to shop for service from competitive electric suppliers. The intent was to create a more competitive market for electric power supply in New Jersey. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third party (i.e. non-utility) energy supplier.

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility is purchasing electricity from a third party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third-party electric suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

9.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey has also been deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility is not purchasing natural gas from a third-party supplier, consider shopping for a reduced rate from third party natural gas suppliers. If your facility is purchasing natural gas from a third-party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third-party natural gas suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
BCI & Megan Hall	33	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	33	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	2.35	11,016	0.0	$1,373.14	$3,487.40	$720.00	2.02
BCI & Megan Hall	9	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	9	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.23	1,066	0.0	$132.83	$568.80	$0.00	4.28
Room L20	22	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	22	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	1.56	7,344	0.0	$915.42	$2,324.93	$480.00	2.02
Room L30	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.21	1,001	0.0	$124.83	$401.40	$80.00	2.57
Room L30	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.06	267	0.0	$33.33	$117.00	$20.00	2.91
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.03	134	0.0	$16.66	$58.50	$10.00	2.91
Room L27	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Room L28	18	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	18	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	1.28	6,009	0.0	$748.98	$1,944.40	$400.00	2.06
Hallway	8	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.27	1,250	0.0	$155.78	$621.60	$20.00	3.86
Hallway	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	79	0.0	$9.87	$107.56	$0.00	10.90
Room L29A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.14	668	0.0	$83.22	$350.00	$60.00	3.48
Room L29A	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.50	2,337	0.0	$291.27	$935.00	$160.00	2.66
Room L23	11	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	11	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.37	1,718	0.0	$214.19	$811.20	$20.00	3.69
Hallway	3	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	238	0.0	$29.61	$322.67	$0.00	10.90
Room L39	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.07	334	0.0	$41.61	$233.00	$40.00	4.64
Room L45	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,380	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.36	1,682	0.0	$209.67	$686.80	$140.00	2.61
Room L44	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.18	835	0.0	$104.03	$408.50	$70.00	3.25
Room L50	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.64	3,004	0.0	$374.49	$1,285.00	$220.00	2.84
Room L48	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.21	1,001	0.0	$124.83	$467.00	$80.00	3.10
Police Personnel Room	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.60	2,837	0.0	$353.69	$1,226.50	$210.00	2.87
Supply Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.32	1,502	0.0	$187.25	$642.50	$110.00	2.84
Room L52	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Hallway	11	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	11	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.37	1,718	0.0	$214.19	$811.20	$20.00	3.69
Hallway	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	79	0.0	$9.87	$107.56	$0.00	10.90
Men'sBathroom	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.10	469	0.0	$58.42	$305.60	$20.00	4.89

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Men'sBathroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	64	3,380	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,380	0.07	313	0.0	$39.04	$300.80	$60.00	6.17
Men'sBathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.06	267	0.0	$33.33	$117.00	$20.00	2.91
Room L21	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.36	1,669	0.0	$208.05	$591.67	$120.00	2.27
Room L21	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	79	0.0	$9.87	$107.56	$0.00	10.90
Room L13	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Room L13	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	64	3,380	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.06	268	0.0	$33.42	$401.40	$80.00	9.62
Room L13	1	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	79	0.0	$9.87	$107.56	$0.00	10.90
Room L11	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.06	267	0.0	$33.33	$117.00	$20.00	2.91
Room L10	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,380	0.09	401	0.0	$49.99	$150.40	$30.00	2.41
Holding Area3	10	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	34	3,380	Relamp	Yes	10	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,366	0.18	844	0.0	$105.22	$598.00	$120.00	4.54
Holding Area4	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	34	3,380	Relamp	Yes	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,366	0.07	338	0.0	$42.09	$308.80	$60.00	5.91
Holding Area5	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	34	3,380	Relamp	Yes	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,366	0.07	338	0.0	$42.09	$308.80	$60.00	5.91
Holding Area6	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	34	3,380	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,380	0.01	65	0.0	$8.09	$48.20	$10.00	4.72
Holding Area7	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	34	3,380	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,380	0.01	65	0.0	$8.09	$48.20	$10.00	4.72
Hallway	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	34	3,380	Relamp	Yes	6	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,366	0.11	506	0.0	$63.13	$405.20	$80.00	5.15
Hallway	2	Exit Signs: Incandescent	Wall Switch	14	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.01	158	0.0	$19.74	$215.11	$0.00	10.90
Court Room 1	31	Compact Fluorescent: 4-PIN 2x26W Recessed Light	Wall Switch	54	3,380	Fixture Replacement	Yes	31	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	23	2,366	0.96	4,487	0.0	$559.36	$2,205.18	$40.00	3.87
Court Room 1	2	Compact Fluorescent: 4x13W Chandelier Light	Wall Switch	54	3,380	Fixture Replacement	No	2	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	23	3,380	0.05	237	0.0	$29.52	$127.30	$0.00	4.31
Room 105	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 104	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 107	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 108	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.96	4,507	0.0	$561.74	$1,585.60	$310.00	2.27
Men's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Wmen's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Court Room 2	31	Compact Fluorescent: 4-PIN 2x26W Recessed Light	Wall Switch	54	3,380	Fixture Replacement	Yes	31	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	23	2,366	0.96	4,487	0.0	$559.36	$2,205.18	$40.00	3.87
Court Room2	2	Compact Fluorescent: 4x13W Chandelier Light	Wall Switch	54	3,380	Fixture Replacement	No	2	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	23	3,380	0.05	237	0.0	$29.52	$127.30	$0.00	4.31
Room 105-2	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 104-2	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 107-2	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 108-2	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Hallway	18	Linear Fluorescent - T8: 3' T8 (25W) - 3L	Wall Switch	96	3,380	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.96	4,507	0.0	$561.74	$1,585.60	$310.00	2.27
Men's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Wmen's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Court Room 3	31	Compact Fluorescent: 4-PIN 2x26W Recessed Light	Wall Switch	54	3,380	Fixture Replacement	Yes	31	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	23	2,366	0.96	4,487	0.0	$559.36	$2,205.18	$40.00	3.87
Court Room 3	2	Compact Fluorescent: 4x13W Chandelier Light	Wall Switch	54	3,380	Fixture Replacement	No	2	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	23	3,380	0.05	237	0.0	$29.52	$127.30	$0.00	4.31
Room 105-3	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 104-3	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 107-3	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 108-3	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.96	4,507	0.0	$561.74	$1,585.60	$310.00	2.27
Men's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Wmen's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Court Room 4	31	Compact Fluorescent: 4-PIN 2x26W Recessed Light	Wall Switch	54	3,380	Fixture Replacement	Yes	31	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	23	2,366	0.96	4,487	0.0	$559.36	$2,205.18	$40.00	3.87
Court Room 4	2	Compact Fluorescent: 4x13W Chandelier Light	Wall Switch	54	3,380	Fixture Replacement	No	2	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	23	3,380	0.05	237	0.0	$29.52	$127.30	$0.00	4.31
Room 105-4	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 104-4	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 107-4	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 108-4	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.96	4,507	0.0	$561.74	$1,585.60	$310.00	2.27

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Men's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Wmen's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Court Room 5	31	Compact Fluorescent: 4-PIN 2x26W Recessed Light	Wall Switch	54	3,380	Fixture Replacement	Yes	31	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	23	2,366	0.96	4,487	0.0	$559.36	$2,205.18	$40.00	3.87
Court Room 5	2	Compact Fluorescent: 4x13W Chandelier Light	Wall Switch	54	3,380	Fixture Replacement	No	2	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	23	3,380	0.05	237	0.0	$29.52	$127.30	$0.00	4.31
Room 105-5	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 104-5	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 107-5	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 108-5	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.96	4,507	0.0	$561.74	$1,585.60	$310.00	2.27
Men's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Wmen's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Court Room 6	31	Compact Fluorescent: 4-PIN 2x26W Recessed Light	Wall Switch	54	3,380	Fixture Replacement	Yes	31	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	23	2,366	0.96	4,487	0.0	$559.36	$2,205.18	$40.00	3.87
Court Room 6	2	Compact Fluorescent: 4x13W Chandelier Light	Wall Switch	54	3,380	Fixture Replacement	No	2	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	23	3,380	0.05	237	0.0	$29.52	$127.30	$0.00	4.31
Room 105-6	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 104-6	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 107-6	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 108-6	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.96	4,507	0.0	$561.74	$1,585.60	$310.00	2.27
Men's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.03	156	0.0	$19.47	$179.20	$20.00	8.18
Wmen's Bathroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.03	156	0.0	$19.47	$179.20	$20.00	8.18
Entrance Hallway	3	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	238	0.0	$29.61	$322.67	$0.00	10.90
Entrance Hallway	13	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	13	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.43	2,031	0.0	$253.14	$937.60	$20.00	3.62
Entrance Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.03	134	0.0	$16.66	$58.50	$10.00	2.91
Wmen's Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.07	334	0.0	$41.61	$233.00	$40.00	4.64
Wmen's Bathroom	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	3	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.08	355	0.0	$44.28	$189.60	$0.00	4.28

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lunch Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.43	2,003	0.0	$249.66	$686.80	$140.00	2.19
Room 113	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	1.12	5,258	0.0	$655.36	$1,811.20	$355.00	2.22
Room 113	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	34	3,380	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.01	38	0.0	$4.76	$117.00	$20.00	20.37
Data Entry Room	32	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	32	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	1.71	8,012	0.0	$998.64	$2,638.40	$520.00	2.12
Room 115	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.07	334	0.0	$41.61	$233.00	$40.00	4.64
Hallway	5	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	5	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.17	781	0.0	$97.36	$432.00	$20.00	4.23
Room 138	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	36	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	1.92	9,013	0.0	$1,123.48	$2,939.20	$580.00	2.10
Room 138	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.05	237	0.0	$29.52	$126.40	$0.00	4.28
Room 117	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.40	1,863	0.0	$232.21	$492.00	$95.00	1.71
Room 118	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.40	1,863	0.0	$232.21	$492.00	$95.00	1.71
Room 119	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.40	1,863	0.0	$232.21	$492.00	$95.00	1.71
Room 113A	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,380	0.04	201	0.0	$24.99	$75.20	$15.00	2.41
Room 113B	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,380	0.04	201	0.0	$24.99	$75.20	$15.00	2.41
Room 113C	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,380	0.04	201	0.0	$24.99	$75.20	$15.00	2.41
Men's Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.07	334	0.0	$41.61	$233.00	$40.00	4.64
Men's Bathroom	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.10	469	0.0	$58.42	$305.60	$20.00	4.89
Wmen's Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.06	267	0.0	$33.33	$117.00	$20.00	2.91
Wmen's Bathroom	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.10	469	0.0	$58.42	$305.60	$20.00	4.89
2nd Floor Hallway	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.71	3,338	0.0	$416.10	$1,402.00	$240.00	2.79
Room 218	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 217	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 216	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 215	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 214	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 213	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 212	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 239	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.85	4,006	0.0	$499.32	$1,257.60	$260.00	2.00
Room 239	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.03	118	0.0	$14.76	$63.20	$0.00	4.28
Room 238	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 238A	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 248	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.21	1,001	0.0	$124.83	$401.40	$80.00	2.57
Room 247	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 243	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.21	1,001	0.0	$124.83	$401.40	$80.00	2.57
Room 246	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 242	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 244	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 221	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.03	134	0.0	$16.66	$58.50	$10.00	2.91
Court Director Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	96	3,380	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.43	2,003	0.0	$249.66	$717.60	$140.00	2.31
Room 224	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.24	1,118	0.0	$139.33	$341.60	$65.00	1.99
Room 223 Data Center	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.48	2,235	0.0	$278.65	$567.20	$110.00	1.64
Room 222	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,366	0.79	3,726	0.0	$464.42	$868.00	$170.00	1.50
Room 211	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.07	334	0.0	$41.61	$233.00	$40.00	4.64
Room 211	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.05	237	0.0	$29.52	$126.40	$0.00	4.28
Room 210	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.14	668	0.0	$83.22	$306.27	$60.00	2.96
Room 209	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Room 208	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	128	3,380	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,366	0.28	1,335	0.0	$166.44	$496.53	$100.00	2.38
Front Entrance	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	3	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.08	355	0.0	$44.28	$189.60	$0.00	4.28
Men's Bathroom	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.13	625	0.0	$77.89	$368.80	$20.00	4.48
Men's Bathroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.11	535	0.0	$66.65	$234.00	$40.00	2.91

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Wmen's Bathroom	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,366	0.13	625	0.0	$77.89	$368.80	$20.00	4.48
Wmen's Bathroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,380	0.11	535	0.0	$66.65	$234.00	$40.00	2.91
Main Lobby	23	Compact Fluorescent: 4-PIN 2x26W Recessed Light	Wall Switch	54	3,380	Fixture Replacement	Yes	23	LED - Fixtures: Downlight Solid State Retrofit	Occupancy Sensor	23	2,366	0.71	3,329	0.0	$415.01	$1,695.97	$40.00	3.99
Front Entrance	10	Compact Fluorescent: 4x13W Chandelier Light	Wall Switch	54	3,380	Fixture Replacement	No	10	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	23	3,380	0.25	1,184	0.0	$147.59	$636.51	$0.00	4.31
Exterior Perimeter	10	Linear Fluorescent - T5HO: 2' T5HO (24W) - 2L	Daylight Dimming	52	1,690	Relamp	Yes	10	LED - Linear Tubes: (2) 2' Lamps	Daylight Dimming	17	845	0.35	831	0.0	$103.55	$732.00	$550.00	1.76
Parking Lot	7	Metal Halide: (2) 400W Lamps	Daylight Dimming	916	1,690	Fixture Replacement	Yes	7	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	146	845	4.80	11,269	0.0	$1,404.70	$13,920.95	$1,015.00	9.19
Court Garage	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,380	0.05	237	0.0	$29.52	$126.40	$0.00	4.28
Court Garage	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	64	3,380	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,366	0.43	2,003	0.0	$249.66	$818.00	$140.00	2.72
Exterior Front	8	Metal Halide: (1) 50W Lamp Recessed can	Daylight Dimming	50	1,690	Fixture Replacement	No	8	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	14	1,690	0.23	550	0.0	$68.56	$3,125.42	$800.00	33.92

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof Top	Loren Cook Exhaust Fan Motor	1	Exhaust Fan	0.5	76.0%	No	2,500	No	76.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Loren Cook Exhaust Fan Motor	1	Exhaust Fan	0.5	76.0%	No	2,500	No	76.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU5	2	Other	1.0	83.0%	No	2,500	No	83.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU5	1	Other	10.0	91.0%	No	2,500	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU5	1	Exhaust Fan	3.0	70.0%	No	2,500	No	70.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU5	1	Other	0.2	70.0%	No	2,500	No	70.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU2	8	Other	1.0	70.0%	No	2,500	No	70.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU2	2	Other	20.0	92.0%	No	2,500	No	92.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU2	1	Exhaust Fan	20.0	92.0%	No	2,500	No	92.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU1	6	Other	1.0	70.0%	No	2,500	No	70.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU1	1	Other	25.0	93.0%	No	2,500	No	93.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU1	1	Makeup Air Fan	7.5	70.0%	No	2,500	No	70.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room L29	Mechaincal Room	2	Heating Hot Water Pump	5.0	86.0%	No	2,000	No	86.0%	Yes	1	1.74	10,062	0.0	$1,254.27	$3,807.95	$0.00	3.04
Roof Top	RTU2	4	Other	1.0	81.0%	No	2,500	No	81.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU2	1	Other	15.0	92.0%	No	2,500	No	92.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU2	1	Makeup Air Fan	5.0	86.0%	No	2,500	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	RTU4	4	Other	5.0	86.0%	No	2,500	No	86.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof Top	Data Center	2	Split-System AC	0.75		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Roof Top (RTU1)	1	Packaged AC	50.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Roof Top (RTU2)	1	Packaged AC	90.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Roof Top (RTU3)	1	Packaged AC	40.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Roof Top (RTU4)	1	Packaged AC	40.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof Top	Roof Top (RTU5)	1	Packaged AC	20.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room L29	Court House	2	Condensing Hot Water Boiler	1,255.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Mechanical	3	Warm Air Unit Heater	64.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room L29	Court House	2	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Bathroom Lobby	5	Faucet Aerator (Lavatory)	2.50	1.00	0.00	0	7.6	$63.88	$35.85	$0.00	0.56
Bathroom 1st Floor	7	Faucet Aerator (Lavatory)	2.50	1.00	0.00	0	10.7	$89.43	$50.19	$0.00	0.56
Bathroom 2nd Floor	4	Faucet Aerator (Lavatory)	2.00	1.00	0.00	0	4.1	$34.07	$28.68	$0.00	0.84

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Court House	119	Desktop Computer	110.0	Yes
Court House	44	Office Multifunction Printer	950.0	Yes
Court House	9	Microwave	850.0	No
Court House	9	Small Printer	45.0	Yes
Court House	1	Digital Printer Photolab	2,000.0	No
Court House	6	Coffee Maker	450.0	Yes
Court House	2	Floor Fan	60.0	No
Court House	5	Small Freezer	8,736.0	No

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lunch Room	1	Refrigerated	Yes	0.00	1,612	0.0	$200.92	$718.80	$0.00	3.58
Lunch Room	1	Non-Refrigerated	Yes	0.00	343	0.0	$42.69	$718.80	$0.00	16.84

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Municipal Courthouse

Primary Property Type: Courthouse
Gross Floor Area (ft²): 60,000
Built: 2000

For Year Ending: October 31, 2015
Date Generated: November 29, 2016

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
Municipal Courthouse 365 summit Ave Jersey City, New Jersey 07306	_____ , (___)___-_____	___ _____ , (___)___-_____ _____

Property ID: 5082917

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
109.6 kBtu/ft²

Source EUI
268.8 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	2,167,490 (33%)
Electric - Grid (kBtu)	4,411,142 (67%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	102.6
National Median Source EUI (kBtu/ft²)	251.5
% Diff from National Median Source EUI	7%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	621

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)