Local Government Energy Audit:
Energy Audit Report

Municipal Building

3515 Bargaintown Road

Egg Harbor Township, NJ 08234

Egg Harbor Township

March 1, 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 saving 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 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 Egg Harbor Township.

The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

This study was conducted by TRC Energy Services, as part of a comprehensive effort to assist New Jersey local governments in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

The Municipal Building is a 38,555 square foot facility which is has three different sections. The police department is in operation continuously throughout the year. The general offices are occupied between 8:30 AM and 4:30 PM, Monday through Friday with no use on the weekends. The court is open later about twice a week for either township or community meetings. The court area has about 40 staff members, there are approximately 55 staff in the police department, and about 10 in the municipal utilities authority. On a busy court night the occupancy can be as high as 300. The building was constructed in four phases in the 1970s. The building is 100% heated and cooled.

Lighting, unitary HVAC equipment and controls at Egg Harbor Township Municipal Building consist of aging and inefficient equipment in need of upgrades and/or replacement. Heating and air conditioning is provided by either the heat pump loop or roof top equipment. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC Energy Services evaluated 16 measures and recommends 13 measures which together represent an opportunity for Egg Harbor Township to reduce annual energy costs by roughly $28,296 and annual greenhouse gas emissions by 211,673 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in roughly 4.9 years. The breakdown of existing and potential utility costs after project implementation are illustrated in the figures below. Together these measures represent an opportunity to reduce Egg Harbor Township's annual energy use by 24%.

Figure 1 – Previous 12 Month Utility Costs

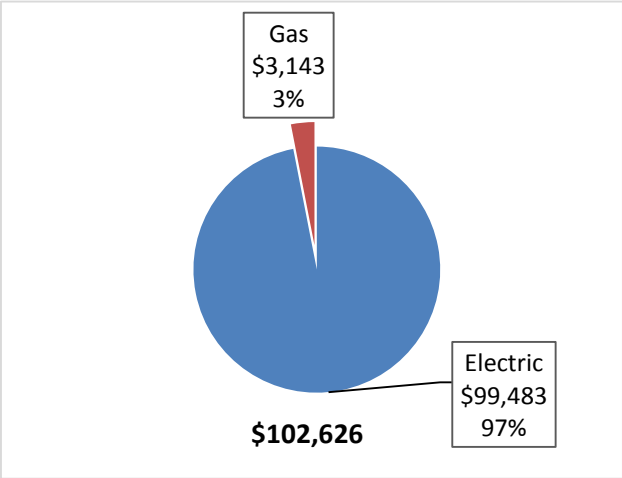


Figure 2 – Potential Post-Implementation Costs (Evaluated Project Measures)

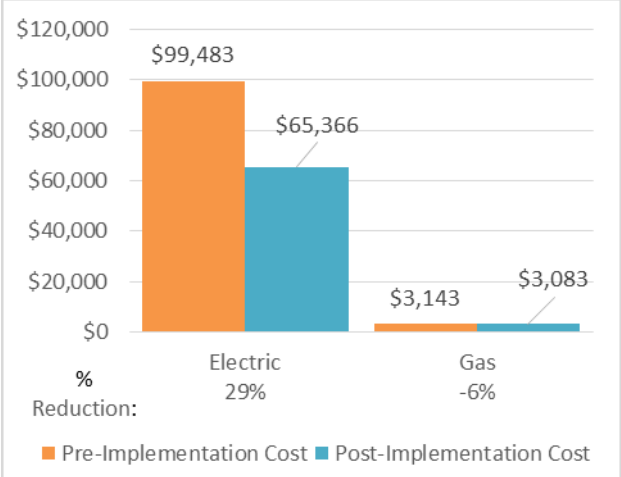
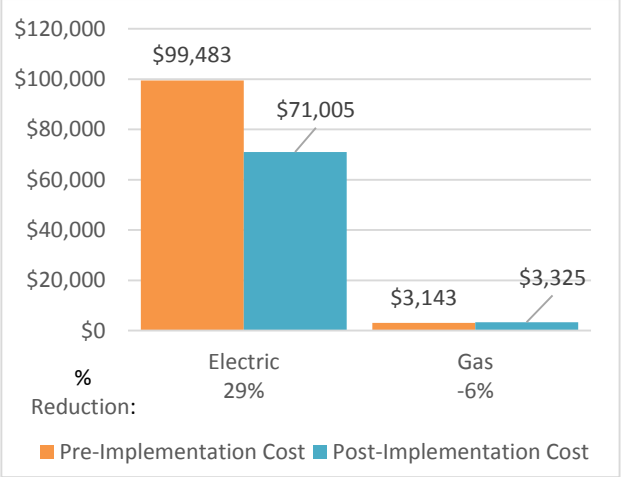


Figure 3 – Potential Post-Implementation Costs (High Priority Project Measures)



A detailed description of Egg Harbor Township's existing energy use can be found in Section 3 "Site Energy Use and Costs".

Estimates of the total cost, energy savings, and financial incentives for the proposed energy efficient upgrades are summarized below in Figure 4. A brief description of each category can be found below and a description of savings opportunities can be found in Section 4, "Energy Conservation Measures".

Figure 4 – 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			**155,320**	**39.3**	**0.0**	**$20,787.01**	**$113,182.88**	**$11,810.00**	**$101,372.88**	**4.9**	**156,406**
ECM 1	Install LED Fixtures	Yes	26,270	4.0	0.0	$3,515.80	$12,566.98	$2,310.00	$10,256.98	2.9	26,454
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	53,967	17.3	0.0	$7,222.59	$37,122.33	$4,070.00	$33,052.33	4.6	54,344
ECM 3	Retrofit Fixtures with LED Lamps	Yes	71,833	17.7	0.0	$9,613.67	$57,793.16	$5,430.00	$52,363.16	5.4	72,336
ECM 4	Install LED Exit Signs	Yes	3,250	0.3	0.0	$434.95	$5,700.42	$0.00	$5,700.42	13.1	3,273
Lighting Control Measures			**26,748**	**5.7**	**0.0**	**$3,579.71**	**$16,708.00**	**$6,150.00**	**$10,558.00**	**2.9**	**26,935**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	14,552	4.0	0.0	$1,947.49	$10,628.00	$1,740.00	$8,888.00	4.6	14,653
ECM 6	Install Daylight Dimming Controls	Yes	7,575	1.0	0.0	$1,013.73	$1,680.00	$280.00	$1,400.00	1.4	7,628
ECM 7	Install High/Low Lighitng Controls	Yes	4,621	0.6	0.0	$618.49	$4,400.00	$4,130.00	$270.00	0.4	4,654
Motor Upgrades			**5,757**	**0.5**	**0.0**	**$770.41**	**$7,807.64**	**$0.00**	**$7,807.64**	**10.1**	**5,797**
ECM 8	Premium Efficiency Motors	Yes	5,757	0.5	0.0	$770.41	$7,807.64	$0.00	$7,807.64	10.1	5,797
Variable Frequency Drive (VFD) Measures			**5,972**	**1.3**	**0.0**	**$799.21**	**$6,551.70**	**$0.00**	**$6,551.70**	**8.2**	**6,013**
ECM 9	Install VFDs on Hot Water Pumps	Yes	5,972	1.3	0.0	$799.21	$6,551.70	$0.00	$6,551.70	8.2	6,013
Electric Unitary HVAC Measures			**3,537**	**1.1**	**0.0**	**$473.33**	**$15,882.72**	**$644.00**	**$15,238.72**	**32.2**	**3,561**
	Install High Efficiency Electric AC	No	3,537	1.1	0.0	$473.33	$15,882.72	$644.00	$15,238.72	32.2	3,561
HVAC System Improvements			**2,288**	**0.5**	**0.0**	**$306.21**	**$1,000.00**	**$500.00**	**$500.00**	**1.6**	**2,304**
	Install Dual Enthalpy Outside Economizer Control	No	2,288	0.5	0.0	$306.21	$1,000.00	$500.00	$500.00	1.6	2,304
Domestic Water Heating Upgrade			**7,277**	**2.7**	**-22.3**	**$791.63**	**$8,637.52**	**$600.00**	**$8,037.52**	**10.2**	**4,722**
ECM 10	Install Tankless Water Heater	Yes	6,780	2.7	-23.1	$717.93	$8,522.80	$600.00	$7,922.80	11.0	4,119
ECM 11	Install Low-Flow Domestic Hot Water Devices	Yes	497	0.0	0.9	$73.69	$114.72	$0.00	$114.72	1.6	603
Plug Load Equipment Control - Vending Machine			**4,836**	**0.0**	**0.0**	**$647.15**	**$690.00**	**$0.00**	**$690.00**	**1.1**	**4,869**
ECM 12	Vending Machine Control	Yes	4,836	0.0	0.0	$647.15	$690.00	$0.00	$690.00	1.1	4,869
Custom Measures			**43,193**	**0.0**	**29.6**	**$6,022.97**	**$152,271.25**	**$0.00**	**$152,271.25**	**25.3**	**46,960**
	Installation of an Energy Management System	No	36,311	0.0	29.6	$5,101.91	$147,446.25	$0.00	$147,446.25	28.9	40,029
ECM 13	Computer Power Management Software	Yes	6,882	0.0	0.0	$921.06	$4,825.00	$0.00	$4,825.00	5.2	6,930
TOTALS			**254,926**	**51.1**	**7.3**	**$34,177.64**	**$322,731.71**	**$19,704.00**	**$303,027.71**	**8.9**	**257,568**

* - 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).

TOTALS (High Priority Measures)			**212,791**	**49.4**	**-22.3**	**$28,296.18**	**$158,402.74**	**$18,560.00**	**$139,842.74**	**4.9**	**211,673**

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 not needed. 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 older standard efficiency motors with high efficiency standard (NEMA Premium). Motors replacements generally assume the same size motors, just higher efficiency. Although occasionally additional savings can be achieved by downsizing motors to better meet current load requirements. This measure saves energy by reducing the power used by the motors, due to improved electrical efficiency.

Variable Frequency Drives (VFDs) are motor control devices. These measures control the speed of a motor so that the motor spins at peak efficiency during partial load conditions. Sensors adapt the speed to flow, temperature, or pressure settings which is much more efficient that usage a valve or damper to control flow rates, or running the motor at full speed when only partial power is needed. These measures save energy by controlling motor usage more efficiently.

Electric Unitary HVAC measures generally involve replacing older inefficient air conditioning systems with modern energy efficient systems. New air conditioning systems can provide equivalent cooling to older

air condition systems at a reduced energy cost. These measures save energy by reducing the power used by the air conditioning systems, due to improved electrical efficiency.

HVAC System Improvements generally involve the installation of automated controls to reduce heating and cooling demand during periods of reduced demand. These measures could encompass changing temperature setpoints, using outside air for free cooling, or limiting excessive outside air during extreme outdoor air temperature conditions. These measures save energy by reducing the demand on HVAC systems and the amount of time systems operate.

Domestic Hot Water upgrade measures generally involve replacing older inefficient domestic water heating systems with modern energy efficient systems. New domestic hot water heating systems can provide equivalent, or greater, water heating capacity compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel used for domestic hot water heating due to improved heating efficiency or reducing standby losses.

Plug Load Equipment control measures generally involve installing automated devices that limit the power usage or operation of equipment that is plugged into an electric outlets when not in use.

Energy Efficient Practices

TRC Energy Services also identified 16 low cost or no cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at Egg Harbor Township include:

- Reduce Air Leakage
- Close Doors and Windows
- Use Window Treatments/Coverings
- 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 Energy Services evaluated the potential for installing on-site generation for Egg Harbor Township. Based on the configuration of the site and its loads there is a high potential for installing a photovoltaic (PV) array.

Figure 5 – Photovoltaic Potential

Potential	High	
System Potential	100	kW DC STC
Electric Generation	119,137	kWh/yr
Displaced Cost	$10,360	/yr
Installed Cost	$260,000	

For details on our evaluation and on-site 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 installation.

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

- SmartStart (SS)
- Direct Install (DI)

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 are based on the SS program. More details on this program and others are available in Section 8.

This facility may also qualify for the Direct Install program which can provide turnkey installation of multiple measures, through an authorized network of participating contractors. This program can provide substantially higher incentives that SmartStart, up to 70% of the cost of selected measures, although measure eligibility will have to be assessed and be verified by the designated DI contractor and, in most cases, they will perform the installation work.

For larger 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 8.4 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (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. By enabling grid operators to call upon commercial facilities to reduce their 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 facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

Additional information on relevant incentive programs is located in Section 8. You may also check the following website for more details: www.njcleanenergy.com/ci

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 6 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Matthew von der Hayden	Deputy Administrator	MVonDerHayden@ehtgov.org	609-926-4044
Sam Gioconda	Division Manager, Buildings & Grounds	sgioconda@ehtgov.org	609-926-3838
TRC Energy Services			
Aimee Lalonde	Auditor	Alalonde@trcsolutions.com	732-855-0033

2.2 General Site Information

On September 28, 2017, TRC Energy Services performed an energy audit at Egg Harbor Township located in Egg Harbor Township, NJ. TRC Energy Services' team met with Matt & Sam to review the facility operations and help focus our investigation on specific energy-using systems.

The Municipal Building is a 38,555 square foot facility which is has three different sections. The building was constructed in four phases in the 1970s. The building is 100% heated and cooled. Lighting, unitary HVAC equipment and controls at Egg Harbor Township Municipal Building consists of aging and inefficient equipment in need of upgrade and/or replacement. Heating and air conditioning is provided by either the heat pump loop or roof top equipment. The packaged terminal air-conditioning (PTAC) units and ceiling units have been replaced as they fail. They range in age from 4 to 20 years. They are all controlled by manual dial thermostats located in the space. The roof top equipment is 20 years old and requires operational and maintenance effort to keep running. The exterior parking lot lighting near the police section of the building has a failed timer and the pole mounted lights are operating unnecessarily during the daylight hours. They light sources are comprised of older inefficient technology.

2.3 Building Occupancy

The police department is in operation continuously throughout the year. The general office area is occupied between 8:30 AM and 4:30 PM, Monday through Friday with no use on the weekends. The court is open later about twice a week for either township or community meetings. The court area has about 40 staff members, there are approximately 55 staff in the police department, and about 10 in the municipal utilities authority. On a busy court night the occupancy can be as high as 300.

The typical schedule is presented in the table below.

Figure 7 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Police Section	Weekday	24/7
Police Section	Weekend	24/7
Remainder of Building	Weekday	8:30 AM to 4:30 PM
Remainder of Building	Weekend	No Use

2.4 Building Envelope

The building envelope is in fair condition and includes exterior wooden clad siding. The building has a flat roof that is in fair condition. The building mostly includes double pane fixed pane windows with metal frames which are in fair condition and show little sign of excessive infiltration. The exterior doors are constructed of aluminum and in good condition.

2.5 On-Site Generation

Egg Harbor Township does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

Lighting System

Lighting at the facility is provided by a variety of lighting technologies. There are a mixture of linear fluorescent fixtures with either T8 lamps with electronic ballasts or T12 lamps with magnetic ballasts. There are also a number of compact fluorescent lamp (CFL) and incandescent lamp fixtures throughout the building. The exit signs are either compact fluorescent lamp or LED fixtures. Lighting control in most spaces is provided by wall switches with some areas such as corridors and restrooms with key switches.

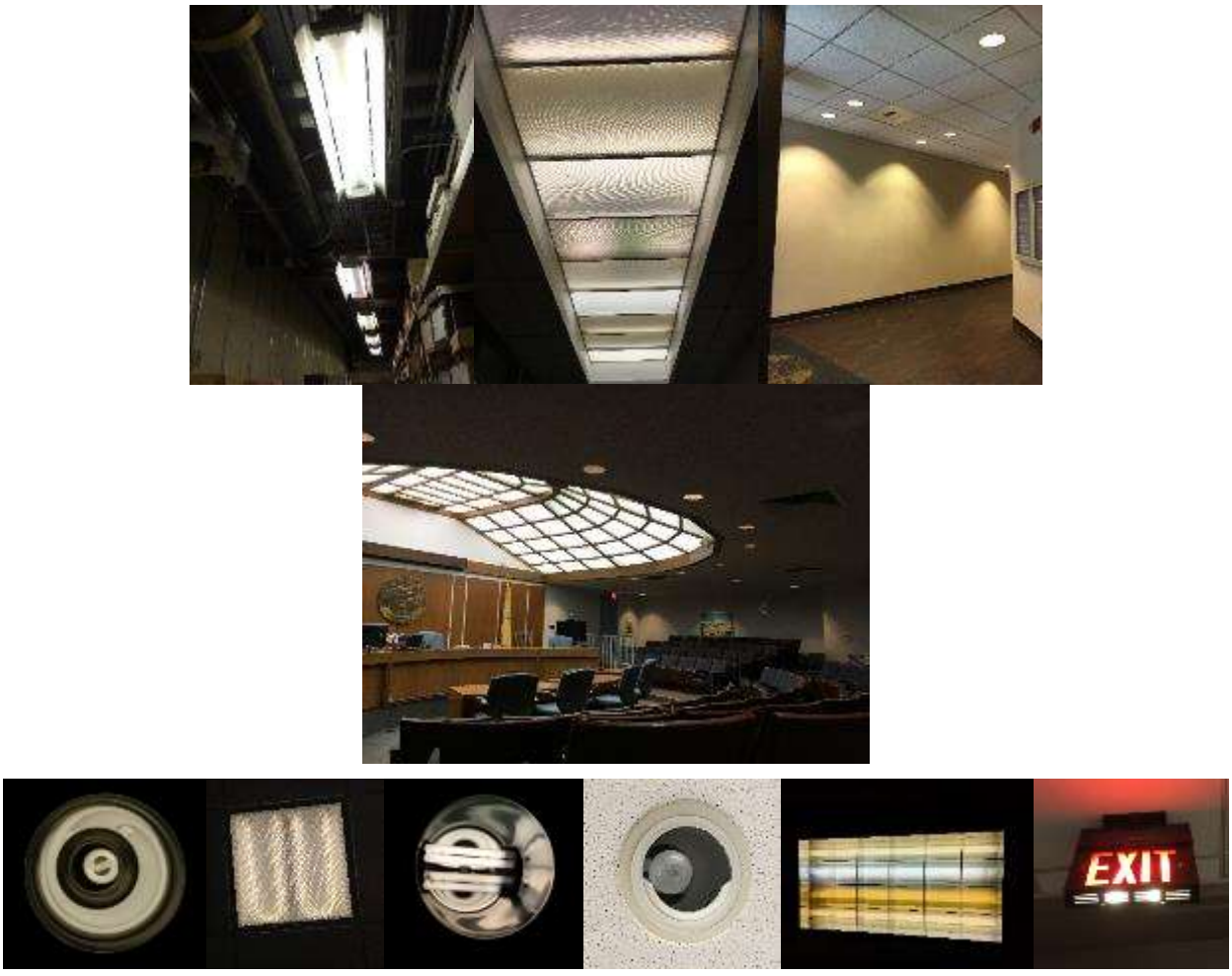


Image 1 – Interior Lighting

The building's exterior lighting is mostly provided by high pressure sodium lamp fixtures. These are either wall pack fixtures, pole mounted shoe box fixtures or flood fixtures. As mentioned above, the police department parking lot lighting fixtures are currently operating during the daytime. There are also compact fluorescent lamp fixtures located at building overhangs and building mounted wall pack fixtures.

Image 2 – Exterior Lighting

There is an opportunity for energy savings by upgrading existing fixtures to LED technology and installing or repairing controls.

Please see **Appendix A: Equipment Inventory & Recommendations** for an inventory of the facility's lighting equipment.

Heating System

Heating and air conditioning is provided by a heat pump loop supplemented by roof top direct expansion (DX) cooling equipment and a series of gas-fired boilers. The packaged terminal air-conditioning (PTAC) and ceiling units range in age from 4 to 20 years old and have been replaced as they fail. Supplemental heating for the heat pump loop is provided by four (4) Weil McLain 175 MBH high efficiency condensing hot water boilers in good condition.

Image 3 – Heating Systems

There are two heating hot water pumps and two heat pump loop circulation pumps which are all driven by constant speed, standard efficiency and motors and appear to be in good operating condition. There is an opportunity for energy savings by replacing the motors with new premium efficiency motors. The larger heat pump loop pump motors are driven by variable frequency drives (VFD). Fan motors within unitary HVAC equipment are controlled by manual dial thermostats located in the space. Although the replacement with programmable thermostats is not justified by energy savings alone, the consideration for installation of more advanced HVAC controls is recommended.

Image 4 – Heating Circulation Pumps

Please see **Appendix A: Equipment Inventory & Recommendations** for an inventory of facility's heating equipment.

Direct Expansion Air Conditioning System (DX)

The majority of air conditioning is provided by the heat pump loop. The police section includes roof top equipment with direct expansion cooling coils. These units are of low efficiency, and at 20 years, nearing the end of their useful life and requiring substantial maintenance. Replacement of these units with high efficiency units is included as an evaluative measure within this report.

The packaged terminal air-conditioning (PTAC) units and ceiling units have been replaced as they fail. We recommend continuing this practice and considering higher efficiency units in the future. There is also an energy recovery unit that is in good condition and of high efficiency. The larger systems are controlled by programmable thermostats located in the space.

Image 5 – Rooftop Cooling and Controls

There are a few split AC systems that condition server rooms in the police section of the building. These are of high efficiency and good condition.

Image 6 – Split System Cooling Units

Please see **Appendix A: Equipment Inventory & Recommendations** for an inventory of the facility's air conditioning equipment.

Domestic Water Heating System

There are three domestic hot water systems in this facility. An electric storage tank water heater serves the court area of the building. This water heater has a tank capacity of 30 gallons and is about 17 years old. An electric storage tank water heater located in the police area of the building has a tank capacity of 40 gallons and is approximately 8 years old. A two year old natural gas fired storage tank water heater in the police basement is of standard efficiency and in good condition. There is an opportunity for energy savings by replacing the electric storage tank water heaters with tank-less gas fired water heaters which are of high efficiency. All of the systems provide hot water to handwashing sinks throughout the building. These sinks are mostly fit with high-flow aerators which contributes to excessive hot water use.

Image 7 – Domestic Hot Water

Please see **Appendix A: Equipment Inventory & Recommendations** for an inventory of the facility's domestic hot water equipment.

Refrigeration

There are a number of stand-up refrigerators with solid doors that range in condition and efficiency. We recommend replacing these with high efficiency equipment as they reach the end of their useful life. We also recommend practicing refrigeration equipment management by consolidating items and removing refrigerators that are not needed. An empty refrigerator was noted during the energy audit. If is it not needed for service, it should be turned off as a no-cost energy reduction measure.

Image 8 – Refrigeration

Please see **Appendix A: Equipment Inventory & Recommendations** for an inventory of the facility's refrigeration equipment.

Building Plug Load

The building plug loads include general office and café equipment. There are about 155 computers throughout the building. There are also both refrigerated and non-refrigerated vending machines located in the police hallway and lunch room, operating continuously. There is an opportunity for energy savings by installing vending machine controls.

Image 9 – Vending Machines

Please see **Appendix A: Equipment Inventory & Recommendations** for an inventory of the facility's plug load equipment.

2.7 Water-Using Systems

There are a total of 16 sinks within restrooms at this facility that are rated for 2.0 gpm or higher. These sinks contributes to excessive hot water use and may be upgraded with low flow aerators as a cost effective approach to reducing energy and water usage for domestic hot water needs.

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 3.4 for additional information.

3.1 Total Cost of Energy

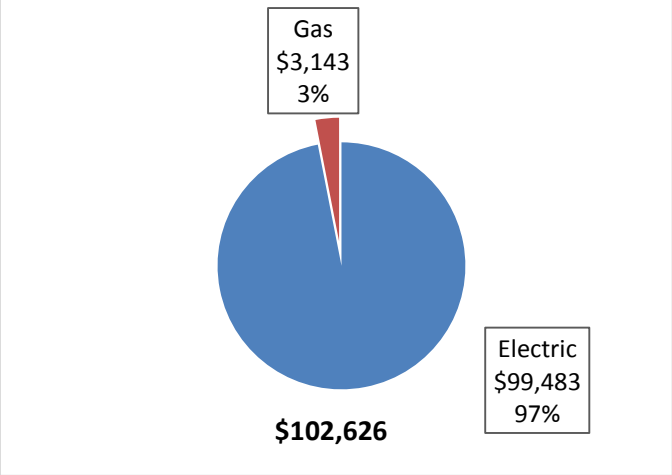
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 8 - Utility Summary

Utility Summary for Egg Harbor Township		
Fuel	**Usage**	**Cost**
Electricity	743,337 kWh	$99,483
Natural Gas	3,838 Therms	$3,143
Total		**$102,626**

The current annual energy cost for this facility is $102,626 as shown in the chart below.

Figure 9 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by Atlantic City Electric. The average electric cost over the past 12 months was $0.134/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 facility pays electric demand charges. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 10 - Graph of 12 Months Electric Usage & Demand

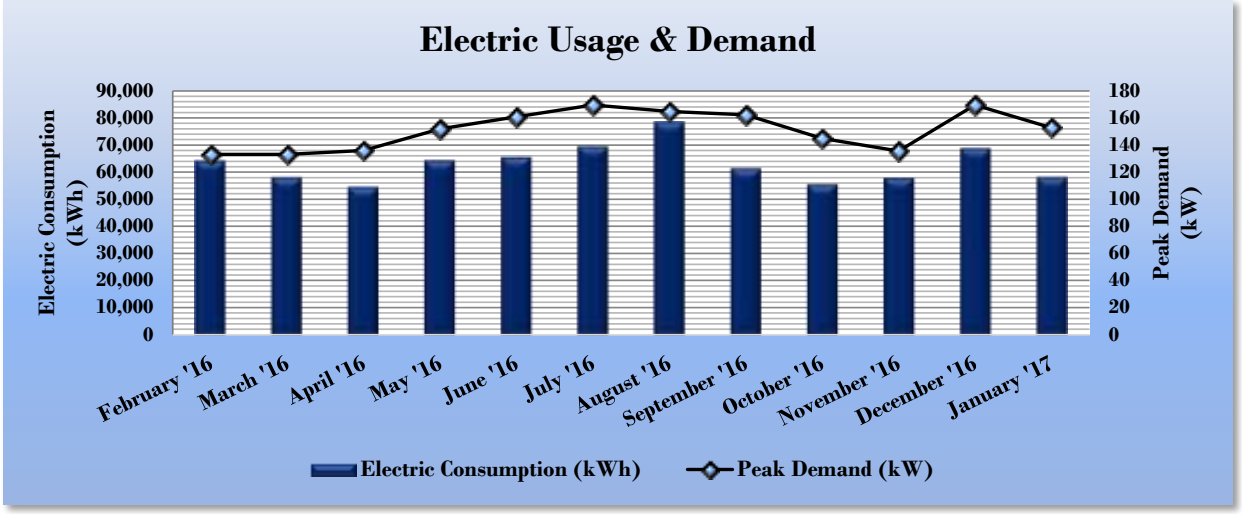


Figure 11 - Table of 12 Months Electric Usage & Demand

Electric Billing Data for Egg Harbor Township					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
3/10/16	34	63,920	133	$1,020	$8,217
4/8/16	29	57,840	133	$1,054	$7,591
5/5/16	27	54,320	136	$973	$7,104
6/7/16	33	64,080	152	$1,281	$8,553
7/7/16	30	65,280	161	$1,232	$8,741
8/5/16	29	69,280	170	$1,256	$9,188
9/7/16	33	78,240	165	$1,485	$10,458
10/7/16	30	61,200	162	$1,386	$8,424
11/4/16	28	55,280	145	$1,236	$7,509
12/7/16	33	57,680	136	$1,278	$7,848
1/9/17	33	68,480	170	$1,697	$9,431
2/9/17	31	57,920	153	$1,258	$7,782
Totals	**370**	**753,520**	**169.6**	**$15,155**	**$100,846**
Annual	**365**	**743,337**	**169.6**	**$14,950**	**$99,483**

3.3 Natural Gas Usage

Natural gas is provided by South Jersey Gas. The average gas cost for the past 12 months is $0.819/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 12 - Graph of 12 Months Natural Gas Usage

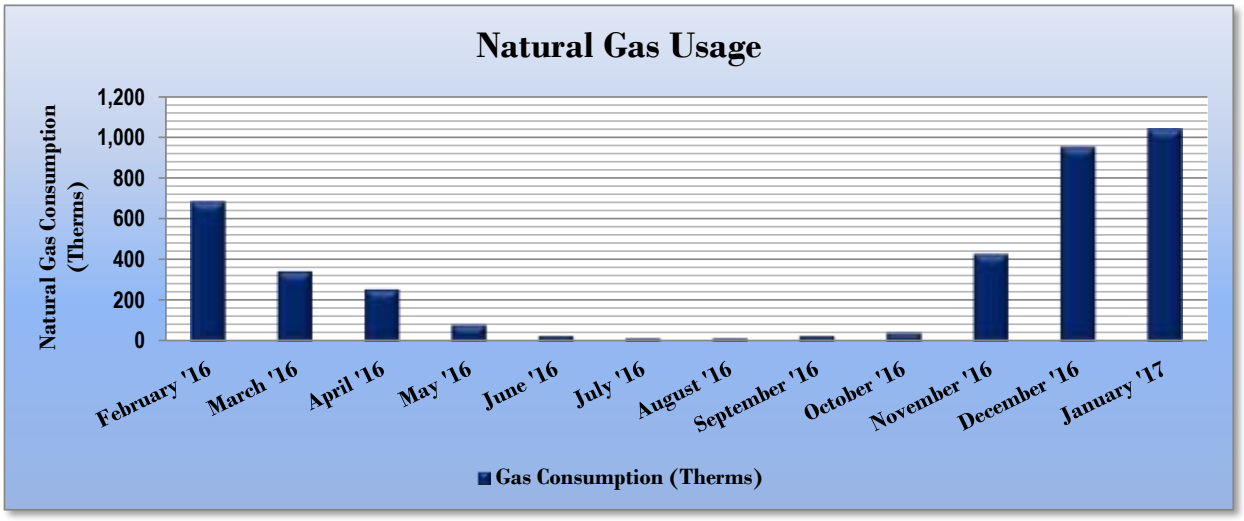


Figure 13 - Table of 12 Months Natural Gas Usage

Gas Billing Data for Egg Harbor Township			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
3/7/16	31	683	$435
4/8/16	32	341	$258
5/5/16	27	254	$202
6/7/16	33	80	$123
7/7/16	30	26	$87
8/5/16	29	13	$70
9/7/16	33	13	$78
10/7/16	30	26	$86
11/4/16	28	42	$106
12/7/16	33	427	$346
1/9/17	33	949	$704
2/9/17	31	1,038	$691
Totals	**370**	**3,890**	**$3,186**
Annual	**365**	**3,838**	**$3,143**

3.4 Benchmarking

This facility was benchmarked using *Portfolio Manager*, an online tool created and managed by the U.S. 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.

Energy Use Intensity 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 14 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Egg Harbor Township	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	217.0	148.1
Site Energy Use Intensity (kBtu/ft^2)	75.7	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 15 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

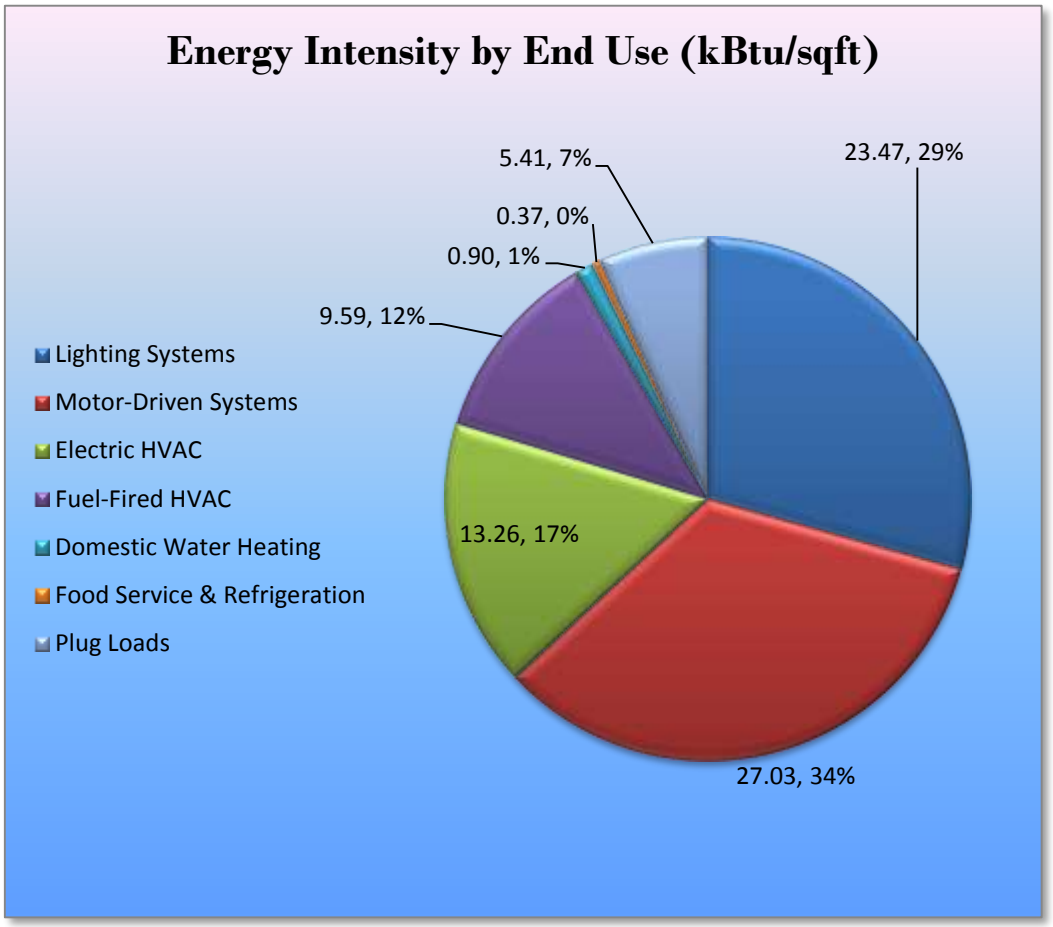
Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Egg Harbor Township	National Median Building Type: Office
Source Energy Use Intensity (kBtu/ft^2)	158.5	148.1
Site Energy Use Intensity (kBtu/ft^2)	57.5	67.3

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 is not is one of the building categories that are eligible to receive a score.

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 to determine their proportional contribution to overall building energy usage. This chart of energy end uses highlights the relative contribution of each equipment category to total energy usage. This can help determine where the greatest benefits might be found from energy efficiency measures.

Figure 16 - Energy Balance (% and kBtu/SF)



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 Egg Harbor Township 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 evaluated measures.

4.1 Recommended ECMs

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

Figure 17 – Summary of Recommended ECMs

Energy Conservation Measure		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		**155,320**	**39.3**	**0.0**	**$20,787.01**	**$113,182.88**	**$11,810.00**	**$101,372.88**	**4.9**	**156,406**
ECM 1	Install LED Fixtures	26,270	4.0	0.0	$3,515.80	$12,566.98	$2,310.00	$10,256.98	2.9	26,454
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	53,967	17.3	0.0	$7,222.59	$37,122.33	$4,070.00	$33,052.33	4.6	54,344
ECM 3	Retrofit Fixtures with LED Lamps	71,833	17.7	0.0	$9,613.67	$57,793.16	$5,430.00	$52,363.16	5.4	72,336
ECM 4	Install LED Exit Signs	3,250	0.3	0.0	$434.95	$5,700.42	$0.00	$5,700.42	13.1	3,273
Lighting Control Measures		**26,748**	**5.7**	**0.0**	**$3,579.71**	**$16,708.00**	**$6,150.00**	**$10,558.00**	**2.9**	**26,935**
ECM 5	Install Occupancy Sensor Lighting Controls	14,552	4.0	0.0	$1,947.49	$10,628.00	$1,740.00	$8,888.00	4.6	14,653
ECM 6	Install Daylight Dimming Controls	7,575	1.0	0.0	$1,013.73	$1,680.00	$280.00	$1,400.00	1.4	7,628
ECM 7	Install High/Low Lighitng Controls	4,621	0.6	0.0	$618.49	$4,400.00	$4,130.00	$270.00	0.4	4,654
Motor Upgrades		**5,757**	**0.5**	**0.0**	**$770.41**	**$7,807.64**	**$0.00**	**$7,807.64**	**10.1**	**5,797**
ECM 8	Premium Efficiency Motors	5,757	0.5	0.0	$770.41	$7,807.64	$0.00	$7,807.64	10.1	5,797
Variable Frequency Drive (VFD) Measures		**5,972**	**1.3**	**0.0**	**$799.21**	**$6,551.70**	**$0.00**	**$6,551.70**	**8.2**	**6,013**
ECM 9	Install VFDs on Hot Water Pumps	5,972	1.3	0.0	$799.21	$6,551.70	$0.00	$6,551.70	8.2	6,013
Domestic Water Heating Upgrade		**7,277**	**2.7**	**-22.3**	**$791.63**	**$8,637.52**	**$600.00**	**$8,037.52**	**10.2**	**4,722**
ECM 10	Install Tankless Water Heater	6,780	2.7	-23.1	$717.93	$8,522.80	$600.00	$7,922.80	11.0	4,119
ECM 11	Install Low-Flow Domestic Hot Water Devices	497	0.0	0.9	$73.69	$114.72	$0.00	$114.72	1.6	603
Plug Load Equipment Control - Vending Machine		**4,836**	**0.0**	**0.0**	**$647.15**	**$690.00**	**$0.00**	**$690.00**	**1.1**	**4,869**
ECM 12	Vending Machine Control	4,836	0.0	0.0	$647.15	$690.00	$0.00	$690.00	1.1	4,869
Custom Measures		**6,882**	**0.0**	**0.0**	**$921.06**	**$4,825.00**	**$0.00**	**$4,825.00**	**5.2**	**6,930**
ECM 13	Computer Power Management Software	6,882	0.0	0.0	$921.06	$4,825.00	$0.00	$4,825.00	5.2	6,930
TOTALS		**212,791**	**49.4**	**-22.3**	**$28,296.18**	**$158,402.74**	**$18,560.00**	**$139,842.74**	**4.9**	**211,673**

* - 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 upgrades to existing lighting fixtures are summarized in Figure 18 below.

Figure 18 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		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		**155,320**	**39.3**	**0.0**	**$20,787.01**	**$113,182.88**	**$11,810.00**	**$101,372.88**	**4.9**	**156,406**
ECM 1	Install LED Fixtures	26,270	4.0	0.0	$3,515.80	$12,566.98	$2,310.00	$10,256.98	2.9	26,454
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	53,967	17.3	0.0	$7,222.59	$37,122.33	$4,070.00	$33,052.33	4.6	54,344
ECM 3	Retrofit Fixtures with LED Lamps	71,833	17.7	0.0	$9,613.67	$57,793.16	$5,430.00	$52,363.16	5.4	72,336
ECM 4	Install LED Exit Signs	3,250	0.3	0.0	$434.95	$5,700.42	$0.00	$5,700.42	13.1	3,273

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. Please see **Appendix A: Equipment Inventory & Recommendations** for a detailed list of the locations and recommended upgrades for each lighting measure.

ECM 1: Install 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	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0
Exterior	26,270	4.0	0.0	$3,515.80	$12,566.98	$2,310.00	$10,256.98	2.9	26,454

Measure Description

We recommend replacing existing fixtures containing high pressure sodium lamps with new high performance LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

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	53,967	17.3	0.0	$7,222.59	$37,122.33	$4,070.00	$33,052.33	4.6	54,344
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend retrofitting existing fluorescent T12 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 a fluorescent tubes.

ECM 3: Retrofit Fixtures with 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	70,961	17.6	0.0	$9,496.97	$56,610.59	$5,430.00	$51,180.59	5.4	71,457
Exterior	872	0.2	0.0	$116.70	$1,182.57	$0.00	$1,182.57	10.1	878

Measure Description

We recommend retrofitting existing incandescent, compact fluorescent and linear fluorescent T8 and T5 lamp fixtures with reduced wattage LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed while leaving the fluorescent fixture ballast in place. LED bulbs can be used in existing fixtures as a direct replacement for most other lighting technologies. 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 a fluorescent tubes and more than 10 times longer than many incandescent lamps.

ECM 4: Install 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	3,250	0.3	0.0	$434.95	$5,700.42	$0.00	$5,700.42	13.1	3,273
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend replacing all compact fluorescent EXIT signs with LED EXIT signs. LED EXIT signs require virtually no maintenance and have a life expectancy of at least 20 years. This measure saves energy by installing LED fixtures, which use less power than other technologies with an equivalent lighting output.

4.1.2 Lighting Control Measures

Figure 19 – Summary of Lighting Control ECMs

Energy Conservation Measure		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		**26,748**	**5.7**	**0.0**	**$3,579.71**	**$16,708.00**	**$6,150.00**	**$10,558.00**	**2.9**	**26,935**
ECM 5	Install Occupancy Sensor Lighting Controls	14,552	4.0	0.0	$1,947.49	$10,628.00	$1,740.00	$8,888.00	4.6	14,653
ECM 6	Install Daylight Dimming Controls	7,575	1.0	0.0	$1,013.73	$1,680.00	$280.00	$1,400.00	1.4	7,628
ECM 7	Install High/Low Lighitng Controls	4,621	0.6	0.0	$618.49	$4,400.00	$4,130.00	$270.00	0.4	4,654

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. Please see **Appendix A: Equipment Inventory & Recommendations** for a detailed list of the locations and recommended lighting controls upgrades for each lighting measure.

ECM 5: Install Occupancy Sensor Lighting 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)
14,552	4.0	0.0	$1,947.49	$10,628.00	$1,740.00	$8,888.00	4.6	14,653

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in offices, storage rooms, restrooms, locker rooms and the police garage areas. Lighting

sensors detect occupancy using ultrasonic and/or infrared sensors. For most spaces, we recommend lighting controls use dual technology sensors, which can eliminate the possibility of any lights turning off unexpectedly. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Some controls also provide dimming options and all modern occupancy controls can be easily over-ridden by room occupants to allow them to manually turn fixtures on or off, as desired. Energy savings results 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. In general, wall switch replacement sensors are recommended for single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in locations without local switching or where wall switches are not in the line-of-sight of the main work area and in large spaces. We recommend a comprehensive approach to lighting design that upgrades both the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 6: Install Photocell 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)
7,575	1.0	0.0	$1,013.73	$1,680.00	$280.00	$1,400.00	1.4	7,628

Measure Description

We recommend installing photocell controls or timers for the exterior parking lot lighting near the police section of the building. These pole mounted shoe box fixtures are currently operating continuously without necessity due to faulty controls. The use of proper controls will limit the operation of these fixtures to dusk to dawn operation.

ECM 7: Install High/Low Lighting 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)
4,621	0.6	0.0	$618.49	$4,400.00	$4,130.00	$270.00	0.4	4,654

Measure Description

We recommend installing occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons. Typical areas for such lighting control are stairwells and interior corridors

Lighting fixtures with these controls operate at default low levels when the area is not occupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. The lighting systems are switched to full lighting levels whenever an occupant is detected. Fixtures are automatically switched back to low level after an area has been vacant for a preset period of time. Energy savings results from only providing full lighting levels when it is required.

For this type of measure the occupancy sensors will generally be ceiling or fixture mounted. Sufficient sensor coverage needs to be provided to ensure that lights turn on in each area as an occupant approaches. Additional savings from reduced lighting maintenance may also result from this measure, due to reduced lamp operation.

4.1.3 Motor Upgrades

ECM 8: Premium Efficiency Motors

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)
5,757	0.5	0.0	$770.41	$7,807.64	$0.00	$7,807.64	10.1	5,797

Measure Description

We recommend replacing standard efficiency motors with *NEMA Premium™* efficiency motors. This measure includes the hot water pump motors and the heat pump loop motors. Our evaluation assumes that existing motors will be replaced with motors of equivalent size and type. Although occasionally additional savings can be achieved by downsizing motors to better meet the motor's current load requirements. The base case motor efficiencies are estimated from nameplate information and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings (2012)*. Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours.

Please see **Appendix A: Equipment Inventory & Recommendations** for more information on existing and proposed motor upgrades.

4.1.4 Variable Frequency Drive Measures

Our recommendations for variable frequency drive (VFD) measures are summarized in Figure 20 below.

Figure 20 – Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		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)
Variable Frequency Drive (VFD) Measures		**5,972**	**1.3**	**0.0**	**$799.21**	**$6,551.70**	**$0.00**	**$6,551.70**	**8.2**	**6,013**
ECM 9	Install VFDs on Hot Water Pumps	5,972	1.3	0.0	$799.21	$6,551.70	$0.00	$6,551.70	8.2	6,013

Please see **Appendix A: Equipment Inventory & Recommendations** for more information about current motors systems and VFD recommendations.

ECM 9: Install VFDs on Hot Water Pumps

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)
5,972	1.3	0.0	$799.21	$6,551.70	$0.00	$6,551.70	8.2	6,013

Measure Description

We recommend installing a variable frequency drives (VFD) to control hot water pumps. 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 results from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

4.1.5 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 21 below.

Figure 21 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		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		**7,277**	**2.7**	**-22.3**	**$791.63**	**$8,637.52**	**$600.00**	**$8,037.52**	**10.2**	**4,722**
ECM 10	Install Tankless Water Heater	6,780	2.7	-23.1	$717.93	$8,522.80	$600.00	$7,922.80	11.0	4,119
ECM 11	Install Low-Flow Domestic Hot Water Devices	497	0.0	0.9	$73.69	$114.72	$0.00	$114.72	1.6	603

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on the facility's existing domestic hot water equipment and recommended system upgrades.

ECM 10: Install Tankless Hot Water Heater

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)
6,780	2.7	-23.1	$717.93	$8,522.80	$600.00	$7,922.80	11.0	4,119

Measure Description

We recommend replacing the existing electric tank water heater with high efficiency gas-fired tankless water heating systems. Tankless water heaters (a.k.a. "on-demand water heaters") only heat water when hot water is needed. Water is heated as it flows through the pipe to the hot water tap. Energy savings from a tankless water heater is based from eliminating heat losses associated with maintaining unnecessary standby hot water capacity. It should be noted that the proposed tankless heaters must have high enough capacity to serve showers. This will need to be evaluated at the design level.

ECM 11: Install Low-Flow DHW Devices

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)
497	0.0	0.9	$73.69	$114.72	$0.00	$114.72	1.6	603

Measure Description

We recommend installing low-flow domestic hot water devices to reduce overall hot water demand. Energy demand from domestic hot water heating systems can be reduced by reducing water usage in general. Faucet aerators can reduce hot water usage, relative to standard aerators, which saves energy. Low-flow devices reduce the overall water flow from the fixture, while still adequate pressure for washing. This reduces the amount of water used per day resulting in energy and water savings.

4.1.6 Plug Load Equipment Control - Vending Machines

ECM 12: Vending Machine Control

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)
4,836	0.0	0.0	$647.15	$690.00	$0.00	$690.00	1.1	4,869

Measure Description

Vending machines operate continuously, even during non-business hours. It is recommended to install occupancy sensor controls to reduce the energy use. These controls power down vending machines when the vending machine area has been vacant for some time, then power up at regular intervals, as needed, to turn machine lights on or keep the product cool. Energy savings are a dependent on vending machine and activity level in the area surrounding the machines.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

4.1.7 Custom Measures

Additional custom measure energy saving opportunities are addressed in this section. Recommended custom measures are summarized in Figure 22 below.

Figure 22 - Summary of Custom ECMs

Energy Conservation Measure		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)
Custom Measures		**6,882**	**0.0**	**0.0**	**$921.06**	**$4,825.00**	**$0.00**	**$4,825.00**	**5.2**	**6,930**
ECM 13	Computer Power Management Software	6,882	0.0	0.0	$921.06	$4,825.00	$0.00	$4,825.00	5.2	6,930

ECM 13: Computer Power Management Software

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)
6,882	0.0	0.0	$921.06	$4,825.00	$0.00	$4,825.00	5.2	6,930

Measure Description

We recommend the implementation of computer power management software. The computing environment in most school and office facilities includes desktops, which are typically left on over nights, weekends and holidays. Screen savers are commonly confused as a power management strategy. This contributes to excessive electrical energy consumption, which may be avoided by proper management. There are innovative software packages available in the market today that are designed to deliver significant energy saving and provide ongoing tracking measurements. Operational and maintenance benefits are captured through the use of a central power management platform where issues may be diagnosed and problematic devices may be isolated. Energy savings policies may be enforced as well as identifying and eliminating underutilized devices. This measure investigates the potential benefits to implementing computer power management software to better match the energy use to user needs. The image to the right is for demonstration purposes only and represents the difference between potential duration of devices being in Power-On States vs. the duration of User Activity. This difference provides an opportunity for energy savings by implementing power management software.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

4.2 ECMs Evaluated But Not Recommended

The measures below have been evaluated by the auditor but are not recommended for implementation at the facility. Reasons for exclusion can be found in each measure description section.

Figure 23 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	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)
Electric Unitary HVAC Measures	**3,537**	**1.1**	**0.0**	**$473.33**	**$15,882.72**	**$644.00**	**$15,238.72**	**32.2**	**3,561**
Install High Efficiency Electric AC	3,537	1.1	0.0	$473.33	$15,882.72	$644.00	$15,238.72	32.2	3,561
HVAC System Improvements	**2,288**	**0.5**	**0.0**	**$306.21**	**$1,000.00**	**$500.00**	**$500.00**	**1.6**	**2,304**
Install Dual Enthalpy Outside Economizer Control	2,288	0.5	0.0	$306.21	$1,000.00	$500.00	$500.00	1.6	2,304
Custom Measures	**36,311**	**0.0**	**29.6**	**$5,101.91**	**$147,446.25**	**$0.00**	**$147,446.25**	**28.9**	**40,029**
Installation of an Energy Management System	36,311	0.0	29.6	$5,101.91	$147,446.25	$0.00	$147,446.25	28.9	40,029
TOTALS	**42,135**	**1.7**	**29.6**	**$5,881.45**	**$164,328.97**	**$1,144.00**	**$163,184.97**	**27.7**	**45,895**

* - 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).

Install High Efficiency Air Conditioning Units

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)
3,537	1.1	0.0	$473.33	$15,882.72	$644.00	$15,238.72	32.2	3,561

Measure Description

We typically recommend replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units when cost effective. There have been significant improvements in both compressor and fan motor efficiencies over the past several years. Therefore, electricity savings can be achieved by replacing older units with new high efficiency units. A higher EER or SEER rating indicates a more efficient cooling system. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling load, and the estimated annual operating hours.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

Reasons for not Recommending

This measure is cost prohibitive. Replacement of these units now is not recommended on the basis of energy savings alone because the payback period for replacing them exceeds the useful life of the equipment. However, this measure was evaluated to demonstrate the potential savings by upgrading to high efficiency equipment. This analysis may be beneficial to support justification for implementation based on other benefits such as improved occupant comfort and operational and maintenance benefits.

Install Dual-Enthalpy Economizers

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)
2,288	0.5	0.0	$306.21	$1,000.00	$500.00	$500.00	1.6	2,304

Measure Description

Dual enthalpy economizers are used to control a ventilation system's outside air intake in order to reduce a facility's total cooling load. A dual-enthalpy economizer monitors the air temperature and humidity of both the outside and return air. The control supplies the lowest energy (temperature and humidity) air

to the air handling system. When outside air conditions allow, outside air can be used for cooling instead of running the air handling system's compressor. This reduces the demand on the cooling system, lowering its usage hours and saving energy.

Savings result from using outside air instead of mechanical cooling when outside air conditions permit.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

Reasons for not Recommending

While dual enthalpy economizers are a good practice, it is not recommended to install them on aging failing units. Be sure that economizers are set to properly function when the units are finally replaced.

Installation of an Energy Management System

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)
36,311	0.0	29.6	$5,101.91	$147,446.25	$0.00	$147,446.25	28.9	40,029

Measure Description

The installation of an Energy Management System (EMS) increases the efficiency of the building HVAC system operation. Upgrade of controls to optimize the start/stop of all key HVAC equipment and tying in space temperature controls will minimize the amount of wasted energy. Schedules may be put in place to limit system operation when the building is closed. Temperature set back controls may be applied to operate systems only to the point necessary. Ventilation and economizer controls and programming would allow air handling units to operate according to room schedules, occupancy and availability for "free cooling" or "free heating". If this measure is of high interest regardless of the estimated payback period, we recommend that an HVAC contractor who specializes in energy management systems be contacted for a detailed evaluation and implementation.

Please see **Appendix A: Equipment Inventory & Recommendations** for more details on existing equipment and proposed measures.

Reasons for not Recommending

This measure is cost prohibitive. Installation of a sophisticated control system at this time is not recommended on the basis of energy savings alone due to the poor payback period. However, this measure was evaluated to demonstrate the potential savings and could be considered for other benefits, including tighter temperature control, comfort, and convenience.

Consider a retro-commissioning study to help with further evaluation of the cost effectiveness of this ECM by providing a deeper analysis of the building system operations.

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 many low cost or no-cost energy efficiency strategies. By employing certain behavioral and operational changes and performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and energy and O&M 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.

Use Window Treatments/Coverings

A substantial amount of heat gain can occur through uncovered or untreated windows, especially older single pane windows and east or west-facing windows. Treatments such as high-reflectivity films or covering windows with shades or shutters can reduce solar heat gain and, consequently, cooling load and can reduce internal heat loss and the associated heating load.

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 air flow 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 percent 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 is 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 to four 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. For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices

Water Conservation

Installing low-flow faucets or faucet aerators, low-flow showerheads, and kitchen sink pre-rinse spray valves saves both energy and water. These devices save energy by reducing the overall amount of hot water used hence reducing the energy used to heat the water. 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.

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 4.1.5 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.

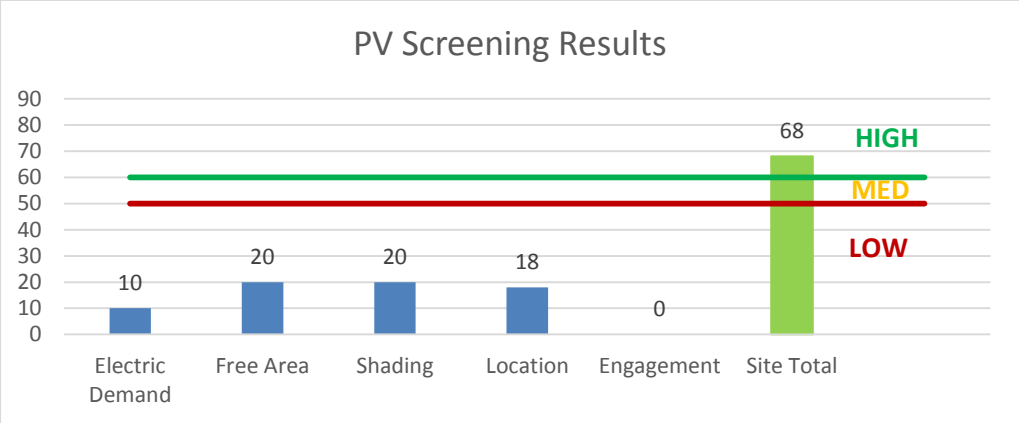
6.1 Photovoltaic

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 PV array.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high potential for PV at the site. A PV array located on the roof of the main building may be feasible, however the current condition of the roof must be evaluated. If Egg Harbor Township is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 24 - Photovoltaic Screening



Potential	High	
System Potential	100	kW DC STC
Electric Generation	119,137	kWh/yr
Displaced Cost	$10,360	/yr
Installed Cost	$260,000	

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 developed new solar projects and insight into future SREC pricing. Refer to Section 8.6 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

Combined heat and power (CHP) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric generation from a CHP system is typically interconnected to local power distribution systems. Heat is recovered from exhaust and ancillary cooling systems and interconnected to the existing hot water (or steam) distribution systems.

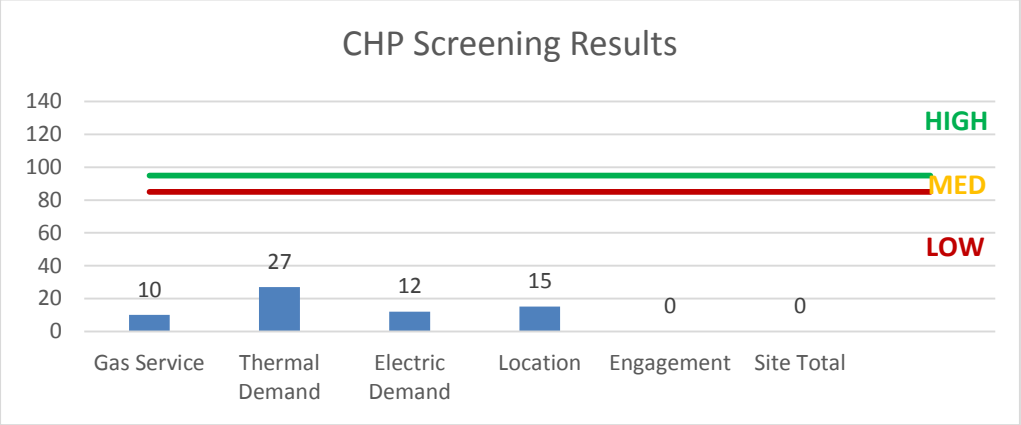
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste 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.

Lack of gas service, low or infrequent thermal load, and lack of space near the existing boilers are the most significant factors contributing to the low to no potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

For a list of qualified firms in New Jersey 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 25 - Combined Heat and Power Screening



7 DEMAND RESPONSE

Demand Response (DR) is a program designed to reduce the electric load of commercial facilities when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response 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.

By enabling grid operators to call upon Curtailment Service Providers and commercial facilities 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 receive payments whether or not their facility is called upon to curtail their electric usage.

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 programs often find it to be a valuable source of revenue for their facility because the payments can significantly offset annual electric 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 curtailment event. DR program participants may need to install smart meters or 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. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (www.pjm.com/markets-and-operations/demand-response/csps.aspx). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (www.pjm.com/training/trainingmaterial.aspx), along with a variety of other DR program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding program rules and requirements for metering and controls, assess a facility's ability to temporarily reduce electric load, and provide details on payments to be expected for participation in the program. Providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, 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 a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 26 for a list of the eligible programs identified for each recommended ECM.

Figure 26 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x		x			
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x		x			
ECM 3	Retrofit Fixtures with LED Lamps	x		x			
ECM 4	Install LED Exit Signs	x		x			
ECM 5	Install Occupancy Sensor Lighting Controls	x		x			
ECM 6	Install Daylight Dimming Controls	x		x			
ECM 7	Install High/Low Lighitng Controls	x		x			
ECM 8	Premium Efficiency Motors			x			
ECM 9	Install VFDs on Hot Water Pumps	x		x			
ECM 10	Install Tankless Water Heater	x		x			
ECM 11	Install Low-Flow Domestic Hot Water Devices			x			
ECM 12	Vending Machine Control						
ECM 13	Computer Power Management Software						

SmartStart (SS) is generally well-suited for implementation of individual measures or small group of measures. It provides flexibility to install measures at your own pace using in-house staff or a preferred contractor. Direct Install (DI) caters to small to mid-size facilities that can bundle multiple ECMs together. This can greatly simplify participation and may lead to higher incentive amounts, but requires the use of pre-approved contractors. The Pay for Performance (P4P) program is a "whole-building" energy improvement program designed for larger facilities. It requires implementation of multiple measures meeting minimum savings thresholds, as well as use of pre-approved consultants. The Large Energy Users Program (LEUP) is available to New Jersey's largest energy users giving them 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. LEUP applicants can use in-house staff or a preferred contractor.

Generally, the incentive values provided throughout the report assume the SS program is utilized because it provides a consistent basis for comparison of available incentives for various measures, though in many cases incentive amounts may be higher through participation in other programs.

Brief descriptions of all relevant financing and incentive programs are located in the sections below. Further information, including most current program availability, requirements, and incentive levels can be found at: www.njcleanenergy.com/ci

In our opinion this building does not appear to be a good candidate for the demand response program.

8.1 SmartStart

Overview

The SmartStart (SS) program offers incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives from year to year for various energy efficiency equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently 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

Most equipment sizes and types are served by this program. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades.

Incentives

The SS prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SS program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

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 50% of the total installed incremental project cost, or a project cost buy down to a one year payback (whichever is less. 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 Direct Install

Overview

Direct Install (DI) is a turnkey program available to existing small to medium-sized facilities with a peak electric demand that does not exceed 200 kW for any recent 12-month period. You will work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

Incentives

The program pays up to **70%** of the total installed cost of eligible measures, up to $125,000 per project. Direct Install participants will also be held to a fiscal year cap of $250,000 per entity.

How to Participate

To participate in the DI program you will need to contact the participating contractor who the region of the state where your facility is located. A complete list of DI program partners is provided on the DI website linked below. The contractor will be paid the measure incentives directly by the program which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Since DI offers a free assessment of eligible measures, DI is also available to small businesses and other commercial facilities too that may not be eligible for the more detailed facility audits provided by LGEA.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI

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 in to 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 descriptions 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 NJCEP incentive programs to help further reduce costs when developing 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
Basement	33	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	500	Relamp & Reballast	No	33	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	1.40	974	0.0	$130.29	$3,861.00	$330.00	27.10
Mechanical Room	7	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	500	Relamp & Reballast	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.34	233	0.0	$31.23	$819.00	$70.00	23.98
Administration Offices	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.66	1,909	0.0	$255.55	$1,087.00	$140.00	3.71
Office	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.44	1,273	0.0	$170.37	$763.33	$100.00	3.89
Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.22	636	0.0	$85.18	$439.67	$60.00	4.46
Office	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.44	1,273	0.0	$170.37	$763.33	$100.00	3.89
Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.22	636	0.0	$85.18	$439.67	$60.00	4.46
Offices	11	Incandescent: Screw in Lamp Recessed Can Dimmable	Wall Switch	100	2,080	Relamp	No	11	LED Screw-In Lamps: Screw in lamps	Wall Switch	7	2,080	0.83	2,404	0.0	$321.80	$591.28	$55.00	1.67
Hallway	2	Incandescent: Screw in Lamp Recessed Can Dimmable	Wall Switch	100	4,000	Relamp	No	2	LED Screw-In Lamps: Screw in lamps	Wall Switch	7	4,000	0.15	841	0.0	$112.52	$107.51	$10.00	0.87
Hallway	10	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	4,000	Relamp	Yes	10	LED Screw-In Lamps: Plug in lamps	High/Low Control	14	2,800	0.13	732	0.0	$98.00	$1,475.06	$350.00	11.48
Conference Room	5	Linear Fluorescent - T12: 4' T12 (40W) - 3L	Wall Switch	127	2,080	Relamp & Reballast	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,456	0.39	1,135	0.0	$151.85	$773.50	$95.00	4.47
Conference Room	8	Incandescent: Screw in Lamp Recessed Can Dimmable	Wall Switch	100	2,080	Relamp	No	8	LED Screw-In Lamps: Screw in lamps	Wall Switch	7	2,080	0.61	1,749	0.0	$234.03	$430.02	$40.00	1.67
Women's Restroom	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,080	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	139	0.0	$18.56	$117.00	$10.00	5.77
Men's Restroom	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,080	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	139	0.0	$18.56	$117.00	$10.00	5.77
Hallway	10	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	4,000	Relamp & Reballast	Yes	10	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,800	0.55	3,060	0.0	$409.53	$1,570.00	$450.00	2.73
Vestibule	2	Compact Fluorescent: Plug in Lamps Recessed Can	None	26	6,000	Relamp	No	2	LED Screw-In Lamps: Plug in lamps	None	14	6,000	0.02	163	0.0	$21.78	$215.01	$0.00	9.87
Storage	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	200	Relamp & Reballast	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	200	0.19	53	0.0	$7.14	$323.67	$40.00	39.74
Storage	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	200	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.10	27	0.0	$3.57	$234.00	$20.00	59.96
Hallway	3	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	4,000	Relamp	No	3	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	4,000	0.03	163	0.0	$21.78	$322.52	$0.00	14.81
Storage	7	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	200	Relamp & Reballast	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.34	93	0.0	$12.49	$819.00	$70.00	59.96
Clerk's Offices	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.66	1,909	0.0	$255.55	$1,087.00	$140.00	3.71
Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.22	636	0.0	$85.18	$439.67	$60.00	4.46
Open Office Area	13	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	13	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	1.43	4,137	0.0	$553.69	$2,219.83	$280.00	3.50
Open Office Area	1	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	2,080	Relamp	No	1	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	2,080	0.01	28	0.0	$3.77	$107.51	$0.00	28.48
Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.22	636	0.0	$85.18	$439.67	$60.00	4.46

	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
Closet	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	200	Relamp & Reballast	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	200	0.19	53	0.0	$7.14	$323.67	$40.00	39.74
Copy/Mail Room	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.44	1,273	0.0	$170.37	$763.33	$100.00	3.89
Vestibule	1	Compact Fluorescent: Plug in Lamps Recessed Can	None	26	6,000	Relamp	No	1	LED Screw-In Lamps: Plug in lamps	None	14	6,000	0.01	81	0.0	$10.89	$107.51	$0.00	9.87
Office	10	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	1.10	3,182	0.0	$425.92	$1,734.33	$220.00	3.56
Hallway	16	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	4,000	Relamp	Yes	16	LED Screw-In Lamps: Plug in lamps	High/Low Control	14	2,800	0.21	1,172	0.0	$156.80	$2,120.10	$560.00	9.95
Hallway - Skylight	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Daylight Dimming	29	3,000	0.46	3,865	0.0	$517.21	$1,202.00	$660.00	1.05
Office	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.66	1,909	0.0	$255.55	$1,087.00	$140.00	3.71
File Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.22	636	0.0	$85.18	$439.67	$60.00	4.46
Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.22	636	0.0	$85.18	$439.67	$60.00	4.46
Lunch Room	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.11	318	0.0	$42.59	$277.83	$40.00	5.58
Hallway	6	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	4,000	Relamp	No	6	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	4,000	0.06	325	0.0	$43.55	$645.04	$0.00	14.81
IT Room	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.44	1,273	0.0	$170.37	$763.33	$100.00	3.89
Stairwells	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	4,200	0.41	3,393	0.0	$454.06	$1,102.00	$540.00	1.24
2nd Floor Planning Office	12	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	2,080	Relamp	No	12	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	2,080	0.12	338	0.0	$45.30	$1,290.07	$0.00	28.48
Planning Office	16	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	1.76	5,092	0.0	$681.47	$2,705.33	$340.00	3.47
Kitchenette	4	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	1,040	Relamp	No	4	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	1,040	0.04	56	0.0	$7.55	$430.02	$0.00	56.96
Kitchenette	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,040	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,040	0.10	139	0.0	$18.56	$234.00	$20.00	11.53
Kitchenette	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,040	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,040	0.03	39	0.0	$5.19	$58.50	$10.00	9.34
Restroom	1	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	1,040	Relamp	No	1	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	1,040	0.01	14	0.0	$1.89	$107.51	$0.00	56.96
Restroom	1	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	50	1,040	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,040	0.03	39	0.0	$5.19	$107.00	$10.00	18.69
Back Skylight Area	4	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	4,000	Relamp & Reballast	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,000	0.19	1,067	0.0	$142.76	$468.00	$40.00	3.00
Storage Rooms	2	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	500	None	No	2	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	500	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage Rooms	4	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	500	Relamp & Reballast	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.19	133	0.0	$17.85	$468.00	$40.00	23.98
Copy Room	6	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,080	Relamp & Reballast	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.29	832	0.0	$111.35	$702.00	$60.00	5.77
Copy Room	1	Incandescent: Screw in Lamp Recessed Can Dimmable	Wall Switch	100	2,080	Relamp	No	1	LED Screw-In Lamps: Screw in lamps	Wall Switch	15	2,080	0.07	200	0.0	$26.74	$53.75	$5.00	1.82

	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
Hallway	2	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	4,000	Relamp	No	2	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	4,000	0.02	108	0.0	$14.52	$215.01	$0.00	14.81
Office	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.44	1,273	0.0	$170.37	$763.33	$100.00	3.89
Office	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.33	955	0.0	$127.77	$601.50	$80.00	4.08
Office	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.66	1,909	0.0	$255.55	$1,087.00	$140.00	3.71
Conference Room	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.33	955	0.0	$127.77	$601.50	$80.00	4.08
Hallway	2	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	4,000	Relamp	No	2	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	4,000	0.02	108	0.0	$14.52	$215.01	$0.00	14.81
Men's Restroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	1,040	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	728	0.22	318	0.0	$42.59	$593.67	$75.00	12.18
Men's Restroom	1	Linear Fluorescent - T5: 5' T5 (35W) - 1L	Wall Switch	40	1,040	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,040	0.02	30	0.0	$4.01	$35.90	$5.00	7.70
Closet	2	Compact Fluorescent: Screw in Lamps	Wall Switch	13	200	None	No	2	Compact Fluorescent: Screw in Lamps	Wall Switch	13	200	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Women's Restroom	2	Compact Fluorescent: Screw in Lamps	Wall Switch	13	1,040	None	No	2	Compact Fluorescent: Screw in Lamps	Wall Switch	13	1,040	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Women's Restroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	1,040	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	728	0.22	318	0.0	$42.59	$593.67	$75.00	12.18
Women's Restroom	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	1,040	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,040	0.03	37	0.0	$4.95	$98.00	$5.00	18.77
Court Wiating Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	4,000	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,800	0.22	1,224	0.0	$163.81	$439.67	$60.00	2.32
Skylight Area	16	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,080	Relamp & Reballast	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Daylight Dimming	29	1,040	0.96	2,764	0.0	$369.92	$2,372.00	$880.00	4.03
Court Open Office	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.31	882	0.0	$118.05	$642.50	$110.00	4.51
Court Open Office	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,456	0.09	274	0.0	$36.71	$305.60	$20.00	7.78
Court Open Office	4	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,080	Relamp & Reballast	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,080	0.10	296	0.0	$39.63	$392.00	$20.00	9.39
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.07	196	0.0	$26.23	$233.00	$40.00	7.36
Office	4	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	2,080	Relamp	No	4	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,080	0.04	127	0.0	$16.99	$127.60	$20.00	6.33
Restroom	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,040	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,040	0.05	69	0.0	$9.28	$117.00	$10.00	11.53
Vestibule	4	Compact Fluorescent: Plug in Lamps Recessed Can	None	26	6,000	Relamp	No	4	LED Screw-In Lamps: Plug in lamps	None	14	6,000	0.04	325	0.0	$43.55	$430.02	$0.00	9.87
Court Main Lobby	10	Compact Fluorescent: Screw in Lamps Recessed Can	Wall Switch	13	4,000	Relamp	No	10	LED Screw-In Lamps: Screw in lamps	Wall Switch	7	4,000	0.05	271	0.0	$36.30	$537.53	$0.00	14.81
Court Main Lobby	9	Incandescent: Screw in Lamp Recessed Can Dimmable	Wall Switch	100	4,000	Relamp	No	9	LED Screw-In Lamps: Screw in lamps	Wall Switch	15	4,000	0.62	3,458	0.0	$462.77	$483.78	$45.00	0.95
Court Main Lobby	4	Incandescent: Screw in Lamp Recessed Can Dimmable	Wall Switch	100	4,000	Relamp	No	4	LED Screw-In Lamps: Screw in lamps	Wall Switch	15	4,000	0.28	1,537	0.0	$205.67	$215.01	$20.00	0.95
Court Room	20	Linear Fluorescent - T8: 3' T8 (25W) - 2L	Wall Switch	48	2,080	Relamp	No	20	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,080	0.44	1,269	0.0	$169.86	$1,068.00	$0.00	6.29

	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	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.54	1,551	0.0	$207.61	$1,170.00	$200.00	4.67
Court Room	20	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch	110	2,080	Relamp	No	20	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,080	0.62	1,786	0.0	$239.07	$2,200.00	$0.00	9.20
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.03	7	0.0	$1.00	$58.50	$10.00	48.59
Hallway	8	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	6,000	Relamp	Yes	8	LED Screw-In Lamps: Plug in lamps	High/Low Control	14	4,200	0.11	879	0.0	$117.60	$1,060.05	$280.00	6.63
Skylight Area	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	6,000	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Daylight Dimming	58	3,000	1.44	11,960	0.0	$1,600.63	$2,442.00	$780.00	1.04
Classroom	9	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	3,000	Relamp & Reballast	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.99	4,131	0.0	$552.87	$1,572.50	$200.00	2.48
Restroom	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,080	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	139	0.0	$18.56	$117.00	$10.00	5.77
Hallway	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	6,000	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	4,200	0.17	1,377	0.0	$184.29	$551.00	$135.00	2.26
Police Office Hallway	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	4,200	0.19	1,582	0.0	$211.78	$579.20	$210.00	1.74
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.07	283	0.0	$37.84	$233.00	$40.00	5.10
Open Office Area	12	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	12	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,100	0.38	1,582	0.0	$211.78	$874.40	$20.00	4.03
Open Office Area	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,000	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,000	0.03	119	0.0	$15.88	$71.80	$10.00	3.89
Work Space	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.07	283	0.0	$37.84	$233.00	$40.00	5.10
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.03	78	0.0	$10.38	$58.50	$10.00	4.67
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.24	995	0.0	$133.20	$496.53	$100.00	2.98
Lounge	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.07	283	0.0	$37.84	$233.00	$40.00	5.10
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,000	0.05	447	0.0	$59.89	$117.00	$20.00	1.62
Closet	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	200	0.02	7	0.0	$0.88	$63.20	$0.00	72.05
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.07	283	0.0	$37.84	$233.00	$40.00	5.10
Communications Office	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.31	1,272	0.0	$170.27	$642.50	$110.00	3.13
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.11	30	0.0	$3.99	$234.00	$40.00	48.59
Hallway	20	Compact Fluorescent: Plug in Lamps Wall Sconce Fixtures	Wall Switch	26	6,000	Relamp	No	20	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	6,000	0.20	1,627	0.0	$217.77	$2,150.12	$0.00	9.87
File Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.66	2,737	0.0	$366.31	$1,162.47	$240.00	2.52
2nd Floor Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,000	0.05	447	0.0	$59.89	$117.00	$20.00	1.62

	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
IT Dept Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.20	848	0.0	$113.51	$467.00	$80.00	3.41
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.14	565	0.0	$75.68	$350.00	$60.00	3.83
Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.24	990	0.0	$132.43	$525.50	$90.00	3.29
Closets	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.08	22	0.0	$2.99	$175.50	$30.00	48.59
Conference Room	24	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	3,000	Relamp	Yes	24	LED Screw-In Lamps: Plug in lamps	Occupancy Sensor	14	2,100	0.32	1,318	0.0	$176.40	$3,120.14	$70.00	17.29
Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.24	990	0.0	$132.43	$525.50	$90.00	3.29
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	155	0.0	$20.76	$117.00	$20.00	4.67
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	155	0.0	$20.76	$117.00	$20.00	4.67
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.14	565	0.0	$75.68	$350.00	$60.00	3.83
Kitchenette	2	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	3,000	Relamp	No	2	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	3,000	0.02	81	0.0	$10.89	$215.01	$0.00	19.75
Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.24	990	0.0	$132.43	$525.50	$90.00	3.29
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.14	565	0.0	$75.68	$350.00	$60.00	3.83
Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.24	990	0.0	$132.43	$525.50	$90.00	3.29
Mail Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.20	848	0.0	$113.51	$467.00	$80.00	3.41
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.24	995	0.0	$133.20	$496.53	$100.00	2.98
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	155	0.0	$20.76	$117.00	$20.00	4.67
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.24	995	0.0	$133.20	$496.53	$100.00	2.98
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.12	498	0.0	$66.60	$306.27	$60.00	3.70
Office	6	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	3,000	Relamp	No	6	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	3,000	0.06	244	0.0	$32.67	$645.04	$0.00	19.75
Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.20	848	0.0	$113.51	$467.00	$80.00	3.41
Elevator Room Hallways	8	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	6,000	Relamp	Yes	8	LED Screw-In Lamps: Plug in lamps	High/Low Control	14	4,200	0.11	879	0.0	$117.60	$1,060.05	$280.00	6.63
1st Floor Hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	4,200	0.31	2,545	0.0	$340.54	$726.50	$405.00	0.94
Lobby	6	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	6,000	Relamp	No	6	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	6,000	0.06	488	0.0	$65.33	$645.04	$0.00	9.87
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.14	565	0.0	$75.68	$350.00	$60.00	3.83
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.14	565	0.0	$75.68	$350.00	$60.00	3.83

	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
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.03	78	0.0	$10.38	$58.50	$10.00	4.67
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.10	424	0.0	$56.76	$291.50	$50.00	4.25
Hallway	3	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	6,000	Relamp	No	3	LED Screw-In Lamps: Plug in lamps	Wall Switch	14	6,000	0.03	244	0.0	$32.67	$322.52	$0.00	9.87
Hallway	12	Compact Fluorescent: Plug in Lamps Wall Sconce Fixtures	Wall Switch	26	6,000	Relamp	Yes	12	LED Screw-In Lamps: Plug in lamps	High/Low Control	14	4,200	0.16	1,318	0.0	$176.40	$1,690.07	$420.00	7.20
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.03	7	0.0	$1.00	$58.50	$10.00	48.59
Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,000	0.03	224	0.0	$29.94	$58.50	$10.00	1.62
Women's Locker Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.24	990	0.0	$132.43	$679.50	$105.00	4.34
Weight Room	17	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	17	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	1.02	4,230	0.0	$566.12	$1,733.27	$360.00	2.43
Work Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.30	1,244	0.0	$166.51	$591.67	$120.00	2.83
Work Room	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.72	2,986	0.0	$399.61	$1,257.60	$260.00	2.50
Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	6,000	0.03	224	0.0	$29.94	$58.50	$10.00	1.62
Men's Locker Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.07	283	0.0	$37.84	$233.00	$40.00	5.10
Men's Locker Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.37	1,555	0.0	$208.11	$759.50	$130.00	3.02
Men's Locker Room	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,100	0.03	132	0.0	$17.65	$333.20	$35.00	16.90
Vestibule	4	Compact Fluorescent: Plug in Lamps Recessed Can	None	26	6,000	Relamp	No	4	LED Screw-In Lamps: Plug in lamps	None	14	6,000	0.04	325	0.0	$43.55	$430.02	$0.00	9.87
Garage	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.61	1,764	0.0	$236.11	$1,169.00	$200.00	4.10
Garage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,456	0.14	392	0.0	$52.47	$350.00	$60.00	5.53
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.11	30	0.0	$3.99	$234.00	$40.00	48.59
Hall	9	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	Yes	9	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	4,200	0.28	2,374	0.0	$317.68	$768.80	$315.00	1.43
Restroom	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,080	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.05	139	0.0	$18.56	$117.00	$10.00	5.77
Open Office Area	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.30	1,244	0.0	$166.51	$591.67	$120.00	2.83
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.12	498	0.0	$66.60	$306.27	$60.00	3.70
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.12	498	0.0	$66.60	$306.27	$60.00	3.70
Office	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	3,000	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.05	200	0.0	$26.77	$117.00	$10.00	4.00
Kitchenette	4	Compact Fluorescent: Screw in Lamps Box Fixtures	Wall Switch	13	3,000	Relamp	No	4	LED Screw-In Lamps: Screw in lamps	Wall Switch	7	3,000	0.02	81	0.0	$10.89	$215.01	$0.00	19.75

	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
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.14	565	0.0	$75.68	$350.00	$60.00	3.83
Restroom	2	Compact Fluorescent: Screw in Lamps Box Fixtures	Wall Switch	13	2,080	None	No	2	Compact Fluorescent: Screw in Lamps Box Fixtures	Wall Switch	13	2,080	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	6,000	0.05	393	0.0	$52.63	$126.40	$0.00	2.40
Holding Room	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,080	0.02	68	0.0	$9.12	$63.20	$0.00	6.93
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.14	565	0.0	$75.68	$350.00	$60.00	3.83
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.10	424	0.0	$56.76	$291.50	$50.00	4.25
Stairs	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	6,000	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	6,000	0.09	759	0.0	$101.63	$190.27	$40.00	1.48
Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.60	2,488	0.0	$333.01	$1,067.33	$220.00	2.54
Holding Cells	3	Compact Fluorescent: Screw in Lamps Box Fixtures	Wall Switch	13	1,000	None	No	3	Compact Fluorescent: Screw in Lamps Box Fixtures	Wall Switch	13	1,000	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.30	1,244	0.0	$166.51	$591.67	$120.00	2.83
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.07	283	0.0	$37.84	$233.00	$40.00	5.10
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.11	30	0.0	$3.99	$234.00	$40.00	48.59
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	200	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.05	15	0.0	$2.00	$117.00	$20.00	48.59
Storage	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	500	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.32	224	0.0	$29.94	$702.00	$120.00	19.44
Hallway	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	Yes	4	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	4,200	0.13	1,055	0.0	$141.19	$452.80	$140.00	2.22
Lunch Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,000	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.48	1,991	0.0	$266.41	$877.07	$180.00	2.62
Stairs	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	6,000	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	6,000	0.02	197	0.0	$26.31	$63.20	$0.00	2.40
Hallway	11	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	6,000	Relamp	Yes	11	LED Screw-In Lamps: Plug in lamps	High/Low Control	14	4,200	0.14	1,208	0.0	$161.70	$1,582.57	$385.00	7.41
Women's Restroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	3,000	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.11	459	0.0	$61.43	$504.00	$55.00	7.31
Men's Restroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	3,000	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,100	0.11	459	0.0	$61.43	$504.00	$55.00	7.31
Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	3,000	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.22	918	0.0	$122.86	$439.67	$60.00	3.09
Stairs	2	Incandescent: Screw in Lamp Recessed Can Dimmable	Wall Switch	100	6,000	Relamp	No	2	LED Screw-In Lamps: Screw in lamps	Wall Switch	15	6,000	0.14	1,153	0.0	$154.26	$107.51	$10.00	0.63
Interview Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,080	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.10	277	0.0	$37.12	$234.00	$20.00	5.77
Hallway	13	Compact Fluorescent: Plug in Lamps Recessed Can	Wall Switch	26	6,000	Relamp	Yes	13	LED Screw-In Lamps: Plug in lamps	High/Low Control	14	4,200	0.17	1,428	0.0	$191.10	$1,797.58	$455.00	7.03
IT Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,080	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,456	0.18	518	0.0	$69.27	$401.40	$80.00	4.64

	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
Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	3,000	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.22	918	0.0	$122.86	$439.67	$60.00	3.09
Office	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	3,000	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.22	918	0.0	$122.86	$439.67	$60.00	3.09
Office	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	3,000	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,100	0.66	2,754	0.0	$368.58	$1,087.00	$140.00	2.57
Stiars	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,000	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,000	0.05	224	0.0	$29.94	$117.00	$20.00	3.24
Storage	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	500	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.21	149	0.0	$19.96	$468.00	$80.00	19.44
Hallway	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,080	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,456	0.27	784	0.0	$104.94	$668.00	$360.00	2.94
Storage	33	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	500	Relamp	No	33	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.89	615	0.0	$82.35	$1,930.50	$330.00	19.44
Elevator Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.05	75	0.0	$9.98	$117.00	$20.00	9.72
Mechanical Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,000	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.27	373	0.0	$49.91	$585.00	$100.00	9.72
Storage Rooms	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	500	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.40	280	0.0	$37.43	$877.50	$150.00	19.44
Transition Spaces	53	Exit Signs: Fluorescent	None	10	8,760	Fixture Replacement	No	53	LED Exit Signs: 2 W Lamp	None	3	8,760	0.30	3,672	0.0	$491.50	$5,700.42	$0.00	11.60
Transition Spaces	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior	11	High-Pressure Sodium: (1) 250W Lamp	None	295	6,000	Fixture Replacement	Yes	11	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	120	3,000	2.10	17,526	0.0	$2,345.60	$4,477.45	$1,595.00	1.23
Exterior	2	High-Pressure Sodium: (1) 70W Lamp	None	95	4,000	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	30	4,000	0.11	588	0.0	$78.64	$781.35	$200.00	7.39
Exterior	8	Compact Fluorescent: Plug in Lamps Recessed Can	None	26	4,000	Relamp	No	8	LED Screw-In Lamps: Plug in lamps	None	14	4,000	0.08	434	0.0	$58.07	$860.05	$0.00	14.81
Exterior	4	High-Pressure Sodium: (1) 100W Lamp	None	138	4,000	Fixture Replacement	No	4	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	None	45	4,000	0.30	1,681	0.0	$225.03	$1,384.74	$200.00	5.26
Exterior	16	High-Pressure Sodium: (1) 250W Lamp	None	295	4,000	Fixture Replacement	No	16	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	None	120	4,000	2.28	12,656	0.0	$1,693.79	$5,538.96	$800.00	2.80
Exterior	4	Compact Fluorescent: Plug in Lamp	None	32	4,000	Relamp	No	4	LED Screw-In Lamps: Plug in lamps	None	14	4,000	0.06	325	0.0	$43.55	$215.01	$0.00	4.94
Exterior	2	Compact Fluorescent: Plug in Lamp	None	42	4,000	Relamp	No	2	LED Screw-In Lamps: Plug in lamps	None	17	4,000	0.04	226	0.0	$30.25	$107.51	$0.00	3.55
Exterior	1	High-Pressure Sodium: (1) 400W Lamp	None	465	4,000	Fixture Replacement	No	1	LED - Fixtures: Other	None	180	4,000	0.23	1,288	0.0	$172.40	$282.24	$5.00	1.61
Exterior	1	High-Pressure Sodium: (1) 100W Lamp	None	138	4,000	Fixture Replacement	No	1	LED - Fixtures: Other	None	45	4,000	0.08	420	0.0	$56.26	$282.24	$5.00	4.93

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
Mechanical Room	Hot Water Pumps	2	Heating Hot Water Pump	5.0	85.5%	No	1,647	Yes	89.5%	Yes	2	1.35	6,405	0.0	$857.23	$8,152.44	$0.00	9.51
Mechanical Room	Pump Motors	2	Water-Source Heat Pump Circulation Pump	30.0	91.0%	Yes	4,380	Yes	94.1%	No		0.45	5,323	0.0	$712.39	$6,206.90	$0.00	8.71
Mechanical Room	Domestic Water Circulators	2	Water Supply Pump	0.2	60.0%	No	1,647	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Circulator	1	Water Supply Pump	0.8	60.0%	No	1,647	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Exhaust Fans	11	Exhaust Fan	0.3	60.0%	No	1,647	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Energy Recovery Unit	1	Supply Fan	5.0	85.0%	No	1,647	No	85.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Console Water Source Heat Pump	29	Supply Fan	0.5	60.0%	No	1,647	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Horizontal Water Source Heat Pump	53	Supply Fan	0.5	60.0%	No	1,647	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Elevator	1	Other	25.0	91.0%	No	360	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Console Water Source Heat Pump	12	Supply Fan	0.5	60.0%	No	3,294	No	60.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Horizontal Water Source Heat Pump	23	Supply Fan	0.5	60.0%	No	3,294	No	60.0%	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
Mechanical Room	Whole 2nd Floor	1	Water Source HP	5.00	160.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Police Section	Split AC Units	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Police Section	Split AC Units	1	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical Room	Court Room	3	Water Source HP	5.00	160.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Energy Recovery Unit	Energy Recovery Unit	1	Water Source HP	10.42	345.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Whole Building	Console Water Source Heat Pump	29	Water Source HP	0.67	8.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Whole Building	Horizontal Water Source Heat Pump	53	Water Source HP	1.24	14.90	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Whole Building	Electric Duct Heaters	5	Electric Resistance Heat		30.50	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Police Section	Roof Top Units	1	Packaged AC	3.00		Yes	1	Packaged AC	3.00		14.00		Yes	0.71	2,496	0.0	$334.09	$7,306.88	$526.00	20.30
Police Section	Roof Top Units	1	Packaged AC	4.00		Yes	1	Packaged AC	4.00		14.00		Yes	0.95	3,328	0.0	$445.45	$9,575.84	$618.00	20.11
Various	Console Water Source Heat Pump	12	Water Source HP	0.67	8.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Various	Horizontal Water Source Heat Pump	23	Water Source HP	1.24	14.90	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
Mechanical Room	Geothermal Loop Back Up	4	Condensing Hot Water Boiler	175.00	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
Court Area	Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	Yes	1	Tankless Water Heater	Natural Gas	92.00%	EF	1.35	3,390	-11.6	$358.97	$4,261.40	$300.00	11.04
Police Area	Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	Yes	1	Tankless Water Heater	Natural Gas	92.00%	EF	1.35	3,390	-11.6	$358.97	$4,261.40	$300.00	11.04
Police Basement	Restrooms	1	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
Restrooms	2	Faucet Aerator (Lavatory)	2.20	1.00	0.00	96	0.0	$12.87	$14.34	$0.00	1.11
Restrooms	4	Faucet Aerator (Lavatory)	2.00	1.00	0.00	160	0.0	$21.46	$28.68	$0.00	1.34
Restrooms	5	Faucet Aerator (Lavatory)	2.20	1.00	0.00	240	0.0	$32.18	$35.85	$0.00	1.11
Restrooms	2	Faucet Aerator (Lavatory)	2.20	1.00	0.00	0	0.4	$3.19	$14.34	$0.00	4.49
Restrooms	3	Faucet Aerator (Lavatory)	2.00	1.00	0.00	0	0.5	$3.99	$21.51	$0.00	5.39

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	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
Municipal Bldg	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Municipal Bldg	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Municipal Bldg	155	Computer	100.0	
Municipal Bldg	37	Printer	250.0	
Municipal Bldg	13	Large Scanner	950.0	
Municipal Bldg	1	TV	90.0	
Municipal Bldg	11	Mini Fridge	260.0	
Municipal Bldg	10	Fans	100.0	
Municipal Bldg	10	Microwave	1,500.0	
Municipal Bldg	9	Toaster	900.0	
Municipal Bldg	6	Coffee Maker	1,200.0	
Municipal Bldg	1	Various Loads	2,000.0	

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
Police Lunch Room	2	Refrigerated	Yes	0.00	3,224	0.0	$431.44	$460.00	$0.00	1.07
Police Lunch Room	1	Non-Refrigerated	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Police Hallway	1	Refrigerated	Yes	0.00	1,612	0.0	$215.72	$230.00	$0.00	1.07
Police Hallway	1	Non-Refrigerated	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Custom Recommendations

Computer Power Management Software

# of Desktops	Normal Running Mode					Idle Running Mode					Suspended/Off Mode				
155	*Mon - Fri 8AM-5PM*	*Mon - Fri 5PM-8AM*	*Weekends & Holidays*	Energy Rate (W)*	Weekly Run Hours	Mon - Fri 8AM-5PM	Mon - Fri 5PM-8AM	*Weekends & Holidays*	*Energy Rate (W)**	*Weekly Run Hours*	Mon - Fri 8AM-5PM	Mon - Fri 5PM-8AM	Weekends & Holidays	Energy Rate (W)*	*Weekly Run Hours*
Existing Conditions	50%	5%	5%	120	**26**	5%	12%	6%	80	**14**	45%	83%	89%	5	**127**
Proposed Conditions	45%	5%	0%	120	**22**	5%	5%	0%	80	**6**	50%	90%	100%	5	**140**

Usage per Device			Energy Impact & Financial Analysis					
Weeks of Use	Annual kWh Usage	*Diversity Factor***	Total Annual kWh Savings	Total Annual Energy Cost Savings	*Cost per Desktop*	*Add'l Hardware Cost*	Total Installation Cost	Simple Payback Period (Years)
48	238	90%	6,882	$921	$15.00	$2,500.0	$4,825	5.24
48	189							

Installation of an Energy Management System

Existing Conditions			Proposed Conditions			Energy Impact & Financial Analysis				
Annual Electric HVAC Energy Use (kWh)	*Annual Heating Energy Use (mmBtu)*	*Annual Fan Energy Use (kWh)*	Assumed % Cooling Savings	Assumed % Heating Savings	Assumed % Motor Savings	Total Annual kWh Savings	Total Annual mmBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Simple Payback Period (Years)
149,891	369.9	305,396	12%	8%	6%	36,311	30	$5,102	$147,446	28.90

Equations: (Based on Industry Standards)

Average Cost for EMS installation is $1.50/sqft

Energy savings range between 10% and 30%

Assumed 50% of the costs may be avoided based on existing equipment