Local Government Energy Audit:
Energy Audit Report

The Manchester Township Municipal Building

1 Colonial Drive
Manchester, NJ 08759

August 6, 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 (TRC) and New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

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

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

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1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for the Manchester Township Municipal Building.

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 assistance with implementation of ECMs.

This study was conducted by TRC Energy Services (TRC), 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 Manchester Township Municipal Building is a 98,364 square foot complex comprised of three distinct building sections –municipal, police EOC, and the courthouse. The building is two-stories with a basement connecting all three sections. The municipal building mostly includes office spaces, while the courthouse includes a courtroom, private offices, holding cells, interview rooms, and mechanical rooms.

The police station consists of an armory, detention rooms, a gymnasium, conference rooms, private offices, and a basement mechanical room.

Lighting at the Manchester Township Municipal Building consists mostly of inefficient T8 linear fluorescent fixtures and some compact fluorescent fixtures. There are some 15-Watt LED linear fixtures installed on the first floor of the municipal section. The exterior lighting consists mostly of 400-Watt metal halide fixtures and some 1000-Watt induction lamps. The heating system consists of condensing hot water boilers serving the air handling units (AHUs), located in the basement and attic, as well as electric resistance heating provided by the packaged terminal air conditioning units (PTACs). Space cooling is provided by the same PTACs, as well as DX cooling provided by the air handling units. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 12 energy conservation measures. Nine are recommended for implementation. These nine ECMs together represent an opportunity for the Manchester Township Municipal Building to reduce its annual energy costs by $31,400 and its annual greenhouse gas emissions by 256,938 lbs CO_2e. We estimate that if all recommended measures are implemented, the project would pay for itself in energy savings alone in 4 years. A breakdown of current utility costs is shown in Figure 1. The estimated reduction in utility costs for the proposed measures in shown in Figure 2. Together these measures represent an opportunity to reduce the Manchester Township Municipal Building's annual energy use by about 22% overall.

Figure 1 – Previous 12 Month Utility Costs

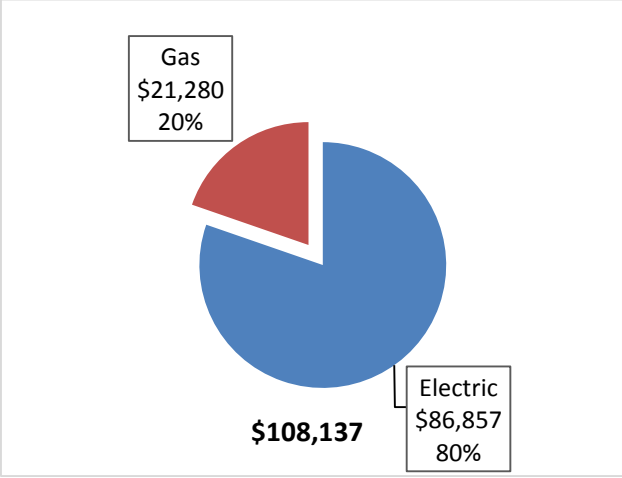
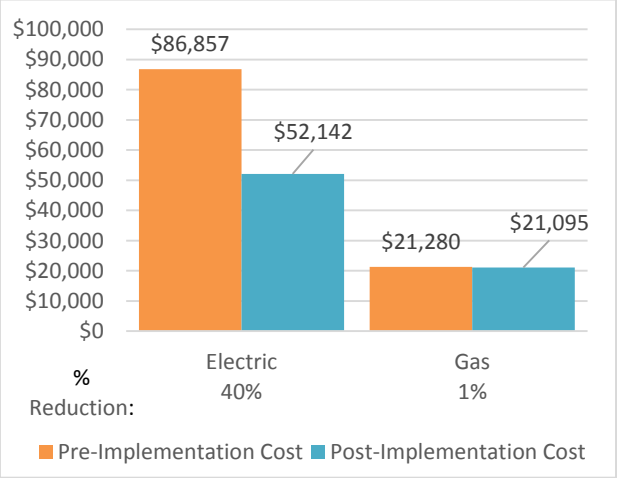


Figure 2 – Potential Post-Implementation Costs



A detailed description of the Manchester Township Municipal Building's existing energy use can be found in Section 3.

Estimates of the total cost, energy savings, and financial incentives for the proposed energy efficient upgrades are summarized below in Figure 3. The motor upgrade, VFD, and AC replacement measures were not included in the list of recommended measures due to their longer payback period.

A brief description of each category can be found below and a description of savings opportunities can be found in Section 4.

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas 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			**201,780**	**26.9**	**0.0**	**$24,853.46**	**$97,048.24**	**$10,045.00**	**$87,003.24**	**3.5**	**203,190**
ECM 1	Install LED Fixtures	Yes	48,356	7.5	0.0	$5,956.04	$43,462.76	$2,200.00	$41,262.76	6.9	48,694
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	9,997	1.3	0.0	$1,231.31	$3,584.40	$0.00	$3,584.40	2.9	10,067
ECM 3	Retrofit Fixtures with LED Lamps	Yes	138,450	17.7	0.0	$17,053.06	$44,085.56	$7,845.00	$36,240.56	2.1	139,418
ECM 4	Install LED Exit Signs	Yes	4,977	0.4	0.0	$613.05	$5,915.53	$0.00	$5,915.53	9.6	5,012
Lighting Control Measures			**46,254**	**6.4**	**0.0**	**$5,697.17**	**$46,304.00**	**$7,085.00**	**$39,219.00**	**6.9**	**46,577**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	40,581	5.5	0.0	$4,998.41	$40,554.00	$5,915.00	$34,639.00	6.9	40,865
ECM 6	Install Daylight Dimming Controls	Yes	5,673	0.9	0.0	$698.76	$5,750.00	$1,170.00	$4,580.00	6.6	5,713
ECM 0	Install High/Low Lighitng Controls	Yes	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0
Motor Upgrades			**675**	**0.2**	**0.0**	**$83.18**	**$5,966.59**	**$0.00**	**$5,966.59**	**71.7**	**680**
	Premium Efficiency Motors	No	675	0.2	0.0	$83.18	$5,966.59	$0.00	$5,966.59	71.7	680
Variable Frequency Drive (VFD) Measures			**11,976**	**4.1**	**0.0**	**$1,475.09**	**$18,909.19**	**$1,136.00**	**$17,773.19**	**12.0**	**12,060**
	Install VFDs on Constant Volume (CV) HVAC	No	11,976	4.1	0.0	$1,475.09	$18,909.19	$1,136.00	$17,773.19	12.0	12,060
Electric Unitary HVAC Measures			**15,761**	**7.6**	**0.0**	**$1,941.34**	**$39,834.80**	**$2,578.79**	**$37,256.01**	**19.2**	**15,872**
	Install High Efficiency Electric AC	No	15,761	7.6	0.0	$1,941.34	$39,834.80	$2,578.79	$37,256.01	19.2	15,872
HVAC System Improvements			**0**	**0.0**	**14.8**	**$184.09**	**$217.50**	**$0.00**	**$217.50**	**1.2**	**1,733**
ECM 7	Install Pipe Insulation	Yes	0	0.0	14.8	$184.09	$217.50	$0.00	$217.50	1.2	1,733
Domestic Water Heating Upgrade			**3,787**	**0.0**	**0.0**	**$466.50**	**$301.14**	**$0.00**	**$301.14**	**0.6**	**3,814**
ECM 8	Install Low-Flow Domestic Hot Water Devices	Yes	3,787	0.0	0.0	$466.50	$301.14	$0.00	$301.14	0.6	3,814
Plug Load Equipment Control - Vending Machine			**1,612**	**0.0**	**0.0**	**$198.53**	**$230.00**	**$0.00**	**$230.00**	**1.2**	**1,623**
ECM 9	Vending Machine Control	Yes	1,612	0.0	0.0	$198.53	$230.00	$0.00	$230.00	1.2	1,623
TOTALS (All Measures)			**281,845**	**45.3**	**14.8**	**34,899**	**208,811**	**20,845**	**187,967**	**5.4**	**285,549**
TOTALS (For Recommended Measures)			**253,433**	**33.4**	**14.8**	**31,400**	**144,101**	**17,130**	**126,971**	**4.0**	**256,938**

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

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

Lighting Upgrades generally involve the replacement of existing lighting components such as lamps and ballasts (or the entire fixture) with higher efficiency lighting components. These measures 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 also identified 11 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 operation and maintenance costs (O&M). Potential opportunities identified at the Manchester Township Municipal Building include:

- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Turn Off Unneeded Motors
- 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
- Install Plug Load Controls
- Water Conservation

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

On-Site Generation Measures

TRC evaluated the potential for installing on-site power generation for the Manchester Township Municipal Building. Based on the configuration of the site and its loads, there is a high potential for installing a cost-effective photovoltaic (PV) array. 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
- Direct Install
- SREC (Solar Renewable Energy Certificate) Registration Program (SRP)
- Energy Savings Improvement Program (ESIP)

For facilities wanting to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate in this program you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 3 are based on the SmartStart 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 Direct Install 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.

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 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Joe Veni	Supervising Engineer	jveni@manchestertwp.com	732-65-8121
Jeff Ruerup	Maintainence Supervisor	jruerup@manchestertwp.com	908-963-6242
TRC Energy Services			
Vish Nimbalkar	Auditor	VNaikNimbalkar@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On April 24, 2017, TRC performed an energy audit at the Manchester Township Municipal Building located in Manchester, New Jersey. TRC's team met with Joe Veni, Supervising Engineer and Charles Henry to review the facility operations and help focus our investigation on specific energy-using systems.

The Manchester Township Municipal Building is a 98,364 square foot municipal complex comprised of three distinct building sections – municipal building, police EOC, and the courthouse. The building is two-stories with a basement connecting all three sections. The municipal building mostly includes office spaces, while the courthouse includes a courtroom, private offices, holding cells, interview rooms, and mechanical rooms. The police station consists of an armory, detention rooms, a gymnasium, conference rooms, private offices, and a basement mechanical room.

The facility was constructed in 1967. The municipal building is open for business from 8:00 AM to 6:00 PM on the weekdays, with no operation on the weekends. The police station is open 24 hours a day, seven days a week, year round.

Over the last few years the facility has replaced all of its existing T12 fluorescent fixtures with T8 fluorescent fixtures as well as installed LED in some areas of the municipal offices.

2.3 Building Occupancy

The municipal offices and the courthouse are open Monday through Friday and the police station is open 24 hours a day, seven days a week, year round. The typical schedule is presented in the table below. During a typical day, the facility is occupied by 138 staff and ten to 20 visitors.

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Municipal Building	Weekday	8AM - 6PM
Municipal Building	Weekend	8AM - 6PM
Police EOC	Weekday	12AM - 12AM
Police EOC	Weekend	12AM - 12AM

2.4 Building Envelope

The municipal complex is constructed of concrete masonry block with a brick façade. The roof was not accessible during the audit but is a gabled roof construction and appeared to be covered with asphalt shingles. Windows are all operable, double-paned, ¼-inch clear glass with aluminum frames. The window and door seals throughout the building were observed to be in good condition. No excessive air infiltration was noted around any windows or doors. The front exterior doors are constructed of aluminum. They are automatic, sensor controlled and appear to be in good condition.

2.5 On-Site Generation

The municipal complex has a solar thermal domestic hot water system made by Velux (model# U12). The system is connected to a 100-gallon storage tank and can produce 110°F water on a peak day. There is no electric power generation currently installed on site.

2.6 Energy-Using Systems

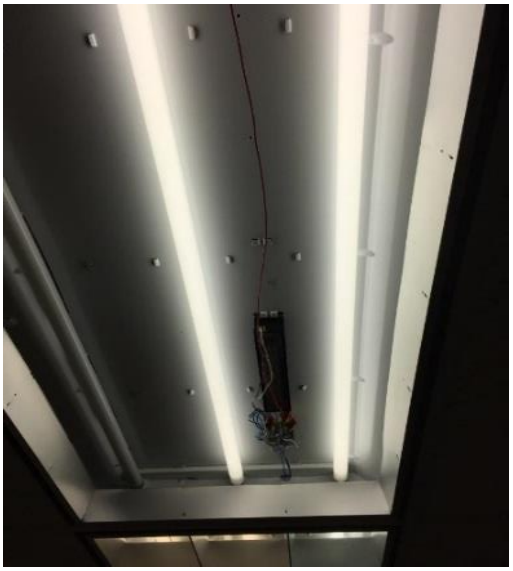
Please see Appendix A: Equipment Inventory & Recommendations for an inventory of the facility's equipment.

Lighting System

Lighting at the facility is provided mostly by 32-Watt linear fluorescent T8 lamps with electronic ballasts, as well as some compact fluorescent lamps (CFL). Most of the fixtures are 2-lamp or 3-lamp, 4-foot long troffers with diffusers. There are also a few U-bend T8 fixture located in the municipal offices. There are 15-Watt LEDs installed in hallways and conference rooms of the municipal office section. The building upgraded to mostly T8 fluorescent fixtures a few years ago.

Lighting control in most spaces is provided by manual wall switches with wall occupancy sensors located in some private offices. Stairwells, elevator lobbies and the main lobby areas do not contain any occupancy sensors and are on 24 hours per day throughout the year.

The building's exterior lighting mostly consists of metal halides and some induction lights, which are controlled by photocells.



Hot Water Heating System

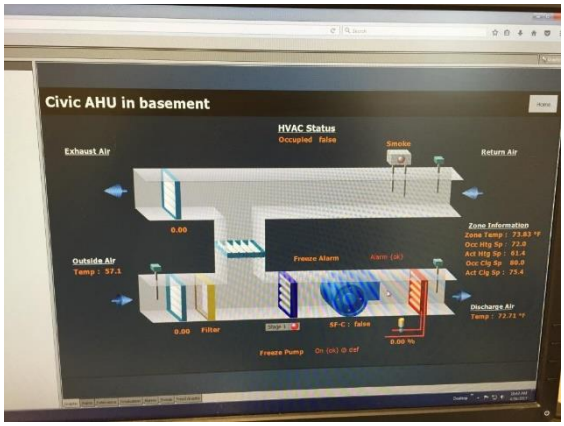
The hot water system consists of seven Weil-McLain condensing hot water boilers. The five boilers serving the municipal and police sections of the building are rated at 235 MBh and 92.5% combustion efficiency. The other two boilers serve the courthouse section of the facility and are rated at 317 MBH and 91.7% efficiency. The boilers were replaced eight years ago and appeared to be in good condition. There are eight Grundfos 3-speed distribution pumps rated at 1.2 hp each that supply hot water to the five air handling units (AHUs) located in the basement and attic. The units are constant air volume and have supply fans rated at 1.5 to 2.4 hp and there are no return fans on the AHUs. The air is exhausted to the outside from the bathroom exhausts. The capacities of the exhaust fans could not be known as the nameplates could not be accessed.

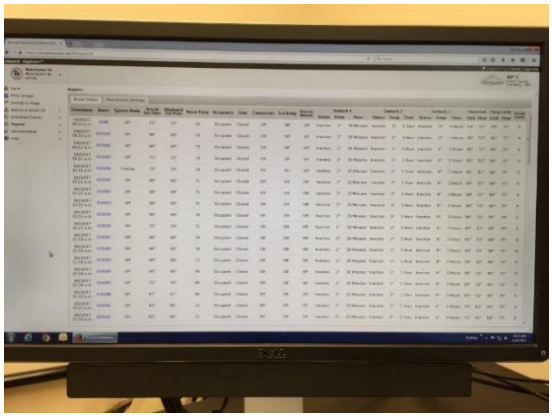
Hot water is supplied at 160°F to the AHUs and a setpoint of 154°F was observed during the audit. The boilers are installed in a modular arrangement and are staged based on the heating demand in the building. They are controlled by a building energy management system (BEMS). They were observed to be in good condition and well maintained.

Direct Expansion Air Conditioning System (DX)

Space cooling to the facility is provided by 74 Amana packaged terminal air conditioning (PTAC) units as well as split system ACs located outside the police EOC section. The PTACs range in size from 0.75 to 1.25 tons and have an energy efficiency rating of between 10 and 11.3 EER. They were installed in 2008 and are centrally controlled by the Amana BEMS. Although each unit has an individual thermostat, the BEMS setpoints supersede the other settings. The BEMS has been programmed to setback the unit setpoint during unoccupied hours. During the audit, a temperature setpoint of 70°F was observed for most units. The units also have an electric resistance heating element that range in heating capacity from 8.3 to 13.8 kBtu/hr.

The split system AC units range in cooling capacity between 2.8 tons and 15 tons. They range in age between three and 29 years old. Their EER values vary from 8.2 to 10.3 EER. These units serve the AHUs located in the basement and the attic. The units are also controlled from the central BEMS.





Building Energy Management System (BEMS)

The majority of the facility is controlled by an Amana building energy management system (BEMS). The system controls the PTAC units, hot water boilers, and the AHUs. The BEMS aggregates the DDC points from throughout the building. The system is capable of providing trends for individual DDC points based on historical data. Additionally, the system is capable of initiating varying levels of temperature setback, start/stop function as well as monitoring energy use and savings. Overall the system appeared to be controlling the HVAC system well, based on the building needs.

Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of one A.O. Smith electric hot water heater with an input rating of 4.5 kW. The water heater has a 50 gallon storage tank. Recirculation pumps distribute 120°F water to the restrooms.

The facility also has a Velux Solar thermal system (model # SSC119B) capable of producing 110°F water which is stored in a separate 100-gallon storage tank.

Building Plug Load

There are 138 computer work stations throughout the facility. All of the computers are desktop units with LCD monitors. There are also 18 42" CRT monitors mostly in the police EOC section. There is no centralized PC power management software installed. There are also multiple printers, paper shredders, refrigerators, toasters, and other standard office equipment throughout the facility. The facility has a one large refrigerated beverage vending machine.

2.7 Water-Using Systems

There are 21 restrooms at this facility. A sampling of restrooms found that the faucets are rated at 2.5 gallons per minute (gpm) or higher, the toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at 2 gpf. Significant amounts of water, as well as energy used to generate hot water, can be saved by installing water conserving "low-flow" rated devices in restrooms.

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

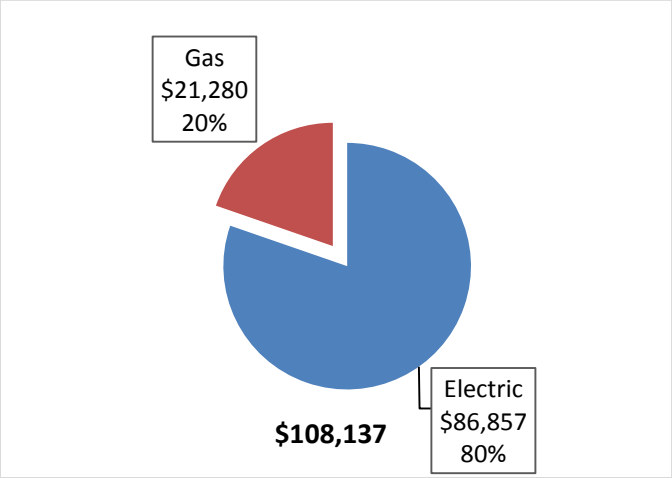
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 6 - Utility Summary

Utility Summary for Manchester Township		
Fuel	**Usage**	**Cost**
Electricity	705,172 kWh	$86,857
Natural Gas	17,113 Therms	$21,280
Total		**$108,137**

The current annual energy cost for this facility is $108,137 as shown in the chart below.

Figure 7 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric rate over a recent 12 month period was found to be $0.123/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 8 - Electric Usage & Demand

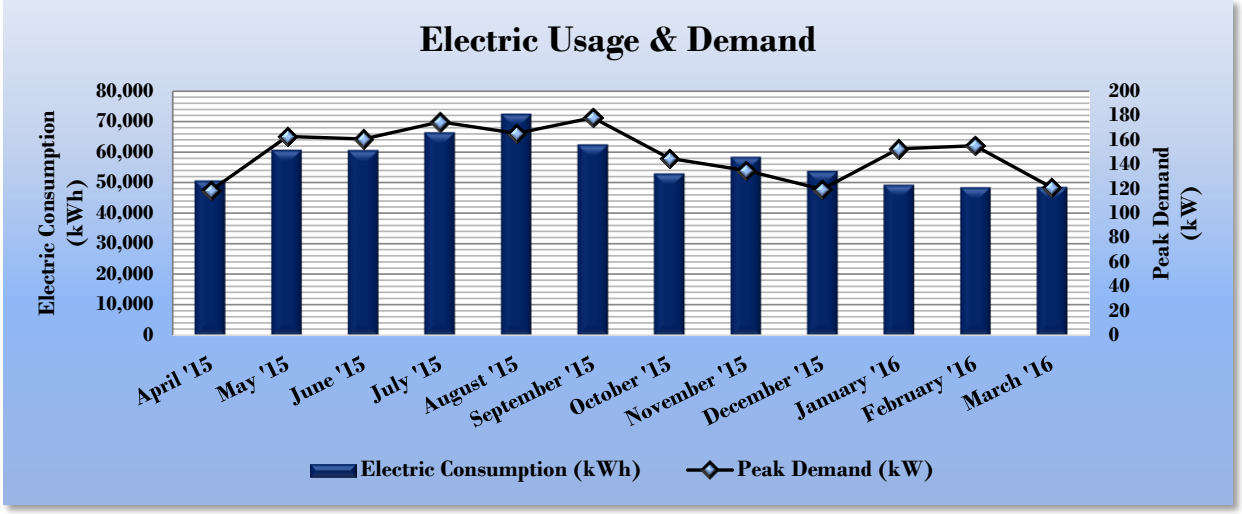


Figure 9 - Electric Usage & Demand

Electric Billing Data for Manchester Township					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
5/1/15	29	50,560	119		$5,978
6/2/15	31	60,640	163		$7,351
7/1/15	28	60,520	161		$7,570
7/31/15	29	66,360	175		$8,290
9/1/15	31	72,400	165		$8,891
10/1/15	29	62,400	178		$7,817
10/30/15	28	52,880	145		$6,599
12/3/15	33	58,320	135		$7,146
1/4/16	31	53,720	120		$6,554
2/2/16	28	49,240	153		$6,055
3/2/16	28	48,400	155		$5,986
4/1/16	29	48,480	121		$6,004
Totals	**354**	**683,920**	**178.2**	**$0**	**$84,239**
Annual	**365**	**705,172**	**178.2**	**$0**	**$86,857**

3.3 Natural Gas Usage

Natural gas is provided by New Jersey Natural Gas. The average natural gas rate over a recent 12 month period was found to be $1.243/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 10 - Natural Gas Usage

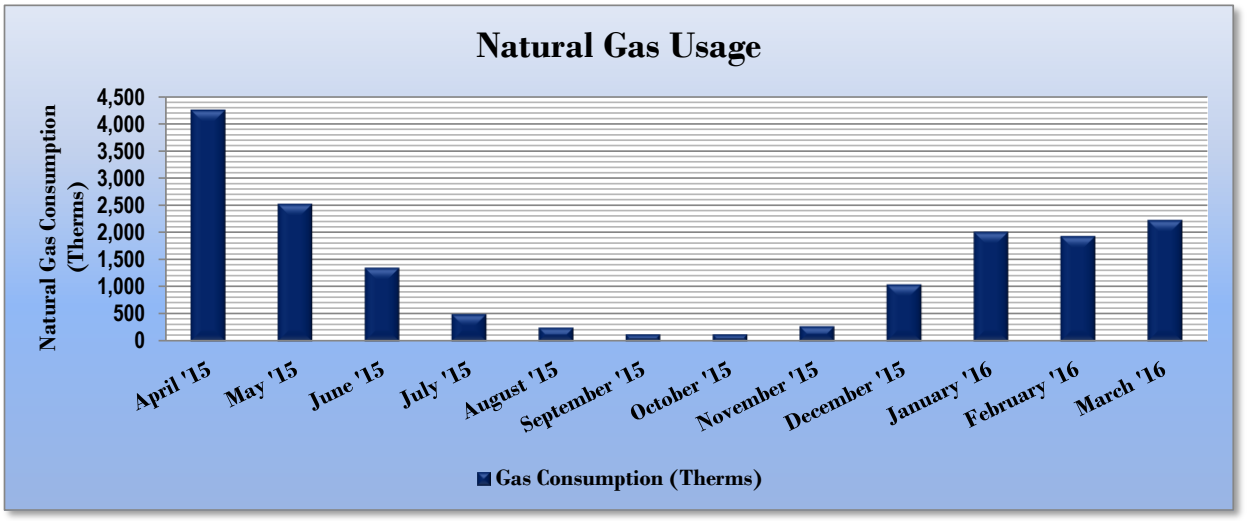


Figure 11 - Natural Gas Usage

Gas Billing Data for Manchester Township			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
5/1/15	29	4,244	$4,841
6/2/15	31	2,520	$2,979
7/1/15	28	1,349	$1,714
7/31/15	29	501	$797
9/1/15	31	251	$520
10/1/15	29	126	$389
10/30/15	28	128	$391
12/3/15	33	277	$547
1/4/16	31	1,042	$1,340
2/2/16	28	2,009	$2,346
3/2/16	28	1,927	$2,260
4/1/16	29	2,223	$2,516
Totals	**354**	**16,597**	**$20,638**
Annual	**365**	**17,113**	**$21,280**

3.4 Benchmarking

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

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

Figure 12 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Manchester Township	National Median Building Type: Municipal
Source Energy Use Intensity (kBtu/ft^2)	95.1	148.1
Site Energy Use Intensity (kBtu/ft^2)	41.9	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 13 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Manchester Township	National Median Building Type: Municipal
Source Energy Use Intensity (kBtu/ft^2)	71.8	148.1
Site Energy Use Intensity (kBtu/ft^2)	33.8	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 eligible to receive an ENERGY STAR® score currently because it is a mixed use facility (i.e., a combined courthouse, police station, and municipal building).

A Portfolio Manager Statement of Energy Performance (SEP) was generated for this facility, see Appendix B: ENERGY STAR® Statement of Energy Performance.

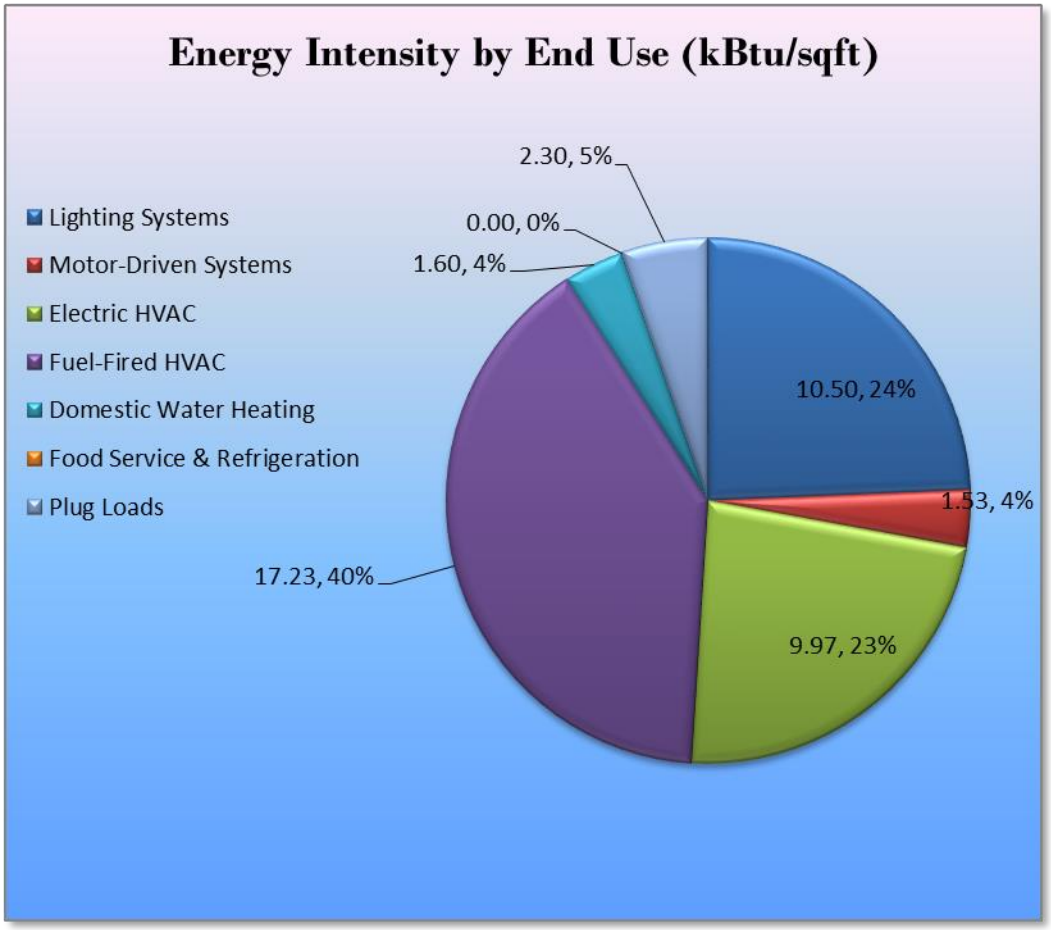
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

A Portfolio Manager® account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio Manager regularly, so that you can keep track of your building's performance. Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

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 14 - Energy Balance (kBtu/SF)



4 ENERGY CONSERVATION MEASURES

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Manchester Township Municipal Building 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 15 – 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		**201,780**	**26.9**	**0.0**	**$24,853.46**	**$97,048.24**	**$10,045.00**	**$87,003.24**	**3.5**	**203,190**
ECM 1	Install LED Fixtures	48,356	7.5	0.0	$5,956.04	$43,462.76	$2,200.00	$41,262.76	6.9	48,694
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	9,997	1.3	0.0	$1,231.31	$3,584.40	$0.00	$3,584.40	2.9	10,067
ECM 3	Retrofit Fixtures with LED Lamps	138,450	17.7	0.0	$17,053.06	$44,085.56	$7,845.00	$36,240.56	2.1	139,418
ECM 4	Install LED Exit Signs	4,977	0.4	0.0	$613.05	$5,915.53	$0.00	$5,915.53	9.6	5,012
Lighting Control Measures		**46,254**	**6.4**	**0.0**	**$5,697.17**	**$46,304.00**	**$7,085.00**	**$39,219.00**	**6.9**	**46,577**
ECM 5	Install Occupancy Sensor Lighting Controls	40,581	5.5	0.0	$4,998.41	$40,554.00	$5,915.00	$34,639.00	6.9	40,865
ECM 6	Install Daylight Dimming Controls	5,673	0.9	0.0	$698.76	$5,750.00	$1,170.00	$4,580.00	6.6	5,713
HVAC System Improvements		**0**	**0.0**	**14.8**	**$184.09**	**$217.50**	**$0.00**	**$217.50**	**1.2**	**1,733**
ECM 7	Install Pipe Insulation	0	0.0	14.8	$184.09	$217.50	$0.00	$217.50	1.2	1,733
Domestic Water Heating Upgrade		**3,787**	**0.0**	**0.0**	**$466.50**	**$301.14**	**$0.00**	**$301.14**	**0.6**	**3,814**
ECM 8	Install Low-Flow Domestic Hot Water Devices	3,787	0.0	0.0	$466.50	$301.14	$0.00	$301.14	0.6	3,814
Plug Load Equipment Control - Vending Machine		**1,612**	**0.0**	**0.0**	**$198.53**	**$230.00**	**$0.00**	**$230.00**	**1.2**	**1,623**
ECM 9	Vending Machine Control	1,612	0.0	0.0	$198.53	$230.00	$0.00	$230.00	1.2	1,623
TOTALS		**253,433**	**33.4**	**14.8**	**$31,399.74**	**$144,100.88**	**$17,130.00**	**$126,970.88**	**4.0**	**256,938**

* - 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

Our recommendations for upgrades to existing lighting fixtures are summarized in Figure 16 below.

Figure 16 – 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		**201,780**	**26.9**	**0.0**	**$24,853.46**	**$97,048.24**	**$10,045.00**	**$87,003.24**	**3.5**	**203,190**
ECM 1	Install LED Fixtures	48,356	7.5	0.0	$5,956.04	$43,462.76	$2,200.00	$41,262.76	6.9	48,694
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	9,997	1.3	0.0	$1,231.31	$3,584.40	$0.00	$3,584.40	2.9	10,067
ECM 3	Retrofit Fixtures with LED Lamps	138,450	17.7	0.0	$17,053.06	$44,085.56	$7,845.00	$36,240.56	2.1	139,418
ECM 4	Install LED Exit Signs	4,977	0.4	0.0	$613.05	$5,915.53	$0.00	$5,915.53	9.6	5,012

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 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	48,356	7.5	0.0	$5,956.04	$43,462.76	$2,200.00	$41,262.76	6.9	48,694

Measure Description

We recommend replacing existing high intensity discharge, CFL and, incandescent 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.

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 ten times longer than many incandescent lamps.

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	9,997	1.3	0.0	$1,231.31	$3,584.40	$0.00	$3,584.40	2.9	10,067
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

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	136,736	17.4	0.0	$16,841.99	$43,902.16	$7,815.00	$36,087.16	2.1	137,692
Exterior	1,714	0.3	0.0	$211.06	$183.40	$30.00	$153.40	0.7	1,726

Measure Description

We recommend retrofitting existing fluorescent, incandescent, and HID fixtures with 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 ten 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	4,977	0.4	0.0	$613.05	$5,915.53	$0.00	$5,915.53	9.6	5,012
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend replacing all incandescent or 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

Our recommendations for lighting control measures are summarized in Figure 17 below.

Figure 17 – 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		**46,254**	**6.4**	**0.0**	**$5,697.17**	**$46,304.00**	**$7,085.00**	**$39,219.00**	**6.9**	**46,577**
ECM 5	Install Occupancy Sensor Lighting Controls	40,581	5.5	0.0	$4,998.41	$40,554.00	$5,915.00	$34,639.00	6.9	40,865
ECM 6	Install Daylight Dimming Controls	5,673	0.9	0.0	$698.76	$5,750.00	$1,170.00	$4,580.00	6.6	5,713

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 5: Install 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)
40,581	5.5	0.0	$4,998.41	$40,554.00	$5,915.00	$34,639.00	6.9	40,865

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all restrooms, storage rooms, private offices and some open office 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 Daylight Dimming Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
5,673	0.9	0.0	$698.76	$5,750.00	$1,170.00	$4,580.00	6.6	5,713

Measure Description

We recommend installing daylight dimming controls that use photosensors to reduce electric lighting in areas when ample daylight lighting is present such as the exterior pole mounted or ground lights. As sunlight level increases, fixture lighting is decreased or turned off. This measure reduces energy use in spaces where sufficient lighting levels can be met by ambient daylight.

Optimum light levels and the method of dimming should be determined during lighting design. 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.

4.1.3 HVAC System Upgrades

Our recommendation for HVAC system improvement are summarized in Figure 18 below.

Figure 18 - Summary of HVAC System Improvement 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)
HVAC System Improvements		**0**	**0.0**	**14.8**	**$184.09**	**$217.50**	**$0.00**	**$217.50**	**1.2**	**1,733**
ECM 7	Install Pipe Insulation	0	0.0	14.8	$184.09	$217.50	$0.00	$217.50	1.2	1,733

ECM 7: Install Pipe Insulation

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)
0	0.0	14.8	$184.09	$217.50	$0.00	$217.50	1.2	1,733

Measure Description

We recommend installing insulation on the hot water distribution system piping located in the basement boiler room. Distribution system losses are dependent on heating water system temperature, the size of the distribution system, and the level of insulation of the piping. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is exposed to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated system efficiency can be significantly reduced.

This measure saves energy by reducing heat losses from the heating distribution system.

4.1.4 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 19 below.

Figure 19 - 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		**3,787**	**0.0**	**0.0**	**$466.50**	**$301.14**	**$0.00**	**$301.14**	**0.6**	**3,814**
ECM 8	Install Low-Flow Domestic Hot Water Devices	3,787	0.0	0.0	$466.50	$301.14	$0.00	$301.14	0.6	3,814

ECM 8: 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)
3,787	0.0	0.0	$466.50	$301.14	$0.00	$301.14	0.6	3,814

Measure Description

We recommend installing low-flow domestic hot water devices in restrooms and break rooms 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 and low-flow showerheads can reduce hot water usage, relative to standard showerheads and aerators, which saves energy. Pre-rinse spray valves (PRSVs)—often used in commercial and institutional kitchens—are designed to remove food waste from dishes prior to dishwashing. Replacing standard pre-rinse spray valves with low flow PRSVs will reduce hot water usage and save energy.

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing. This reduces the amount of water used per day resulting in energy and water savings.

4.1.5 Plug Load Equipment Control - Vending Machines

Our recommendations for plug load equipment measures are summarized in Figure 20 below.

Figure 20 - Summary of Plug Load Equipment 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)
Plug Load Equipment Control - Vending Machine		**1,612**	**0.0**	**0.0**	**$198.53**	**$230.00**	**$0.00**	**$230.00**	**1.2**	**1,623**
ECM 9	Vending Machine Control	1,612	0.0	0.0	$198.53	$230.00	$0.00	$230.00	1.2	1,623

ECM 9: 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)
1,612	0.0	0.0	$198.53	$230.00	$0.00	$230.00	1.2	1,623

Measure Description

Vending machines operate continuously, even during non-business hours. We recommend installing 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.

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 21 – 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)
Motor Upgrades	**675**	**0.2**	**0.0**	**$83.18**	**$5,966.59**	**$0.00**	**$5,966.59**	**71.7**	**680**
Premium Efficiency Motors	675	0.2	0.0	$83.18	$5,966.59	$0.00	$5,966.59	71.7	680
Variable Frequency Drive (VFD) Measures	**11,976**	**4.1**	**0.0**	**$1,475.09**	**$18,909.19**	**$1,136.00**	**$17,773.19**	**12.0**	**12,060**
Install VFDs on Constant Volume (CV) HVAC	11,976	4.1	0.0	$1,475.09	$18,909.19	$1,136.00	$17,773.19	12.0	12,060
Electric Unitary HVAC Measures	**15,761**	**7.6**	**0.0**	**$1,941.34**	**$39,834.80**	**$2,578.79**	**$37,256.01**	**19.2**	**15,872**
Install High Efficiency Electric AC	15,761	7.6	0.0	$1,941.34	$39,834.80	$2,578.79	$37,256.01	19.2	15,872
TOTALS	**28,413**	**11.9**	**0.0**	**$3,499.61**	**$64,710.58**	**$3,714.79**	**$60,995.79**	**17.4**	**28,611**

* - 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).

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)
675	0.2	0.0	$83.18	$5,966.59	$0.00	$5,966.59	71.7	680

Measure Description

We evaluated replacing standard efficiency motors with *NEMA Premium™* efficiency 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 were 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 (2016)*. Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours.

Reasons for not Recommending

Some of the motors supply fans motors on the air handlers are older than 20 years and past 2/3 of their rated equipment useful life (EUL). While evaluating the ECMs we use the simple payback criteria to decide whether or not to recommend each measure. This measure had a payback period which was longer than the EUL for a new premium efficiency motor. As a result, it has not been recommended for upgrade at this time.

However, when this measure is combined with all other proposed measures, the combined payback period is still less than six years. So, the facility may choose to include this upgrade along with other ECMs, despite its longer payback.

Install VFDs on Constant Volume (CV) HVAC

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)
11,976	4.1	0.0	$1,475.09	$18,909.19	$1,136.00	$17,773.19	12.0	12,060

Measure Description

We evaluated installing variable frequency drives (VFDs) to control supply fan motor speeds on all air handlers in the basement and attic, to convert the constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one. Zone thermostats will cause the VFD to modulate fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature. Energy savings results from reducing fan speed (and power) when there is a reduced load required for the zone. The magnitude of energy savings is based on the estimated amount of time that fan motors operate at partial load.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing will have to be determined during the final project design. The control system should be programmed to maintain the minimum air flow whenever the compressor is operating.

Reasons for not Recommending

While evaluating the ECMs we use the simple payback criteria to decide whether or not to recommend a measure. This measure had a payback period which was greater than the two-thirds of the rated EUL for new variable frequency drives, as a result has not been recommended to implementation.

However, when this measure is combined with all other proposed measures, the combined payback period is still less than 6 years. So, the facility may choose to include this upgrade along with other ECMs, despite its longer payback.

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)
15,761	7.6	0.0	$1,941.34	$39,834.80	$2,578.79	$37,256.01	19.2	15,872

Measure Description

We evaluated replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. These AC units serve the courtroom, police gym, civic center, and IT room. 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.

Reasons for not Recommending

While evaluating the ECMs we use the simple payback criteria to decide whether or not to recommend a measure. This measure had a payback period which was greater than the two-thirds of the rated EUL for new high efficiency AC unit and as a result has not been recommended to implementation.

However, when this measure is combined with all other proposed measures, the combined payback period is still less than six years. So, the facility may choose to include this upgrade along with other ECMs, despite its longer payback.

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.

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.

Turn Off Unneeded Motors

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Reducing run hours for these motors can result in significant energy savings. Whenever possible, use automatic devices such as twist timers or occupancy sensors to ensure that motors are turned off when not needed.

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°F-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.

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 "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 gpf and toilets that use as little as 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

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

6 On-Site Generation Measures

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

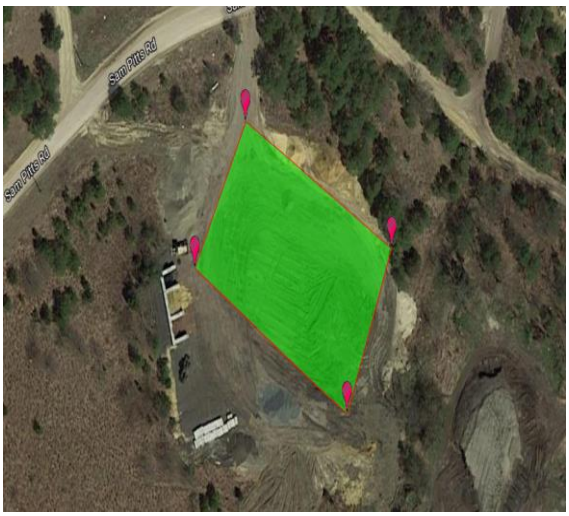
The State of New Jersey's Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines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

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

6.1 Photovoltaic

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

The facility requested TRC to analyze the solar potential at a former landfill site owned by the township located at 1360 Route 70, Whiting, New Jersey. The image below the rough area considered for the solar PV and constitutes approximately 117,000 sq. feet.



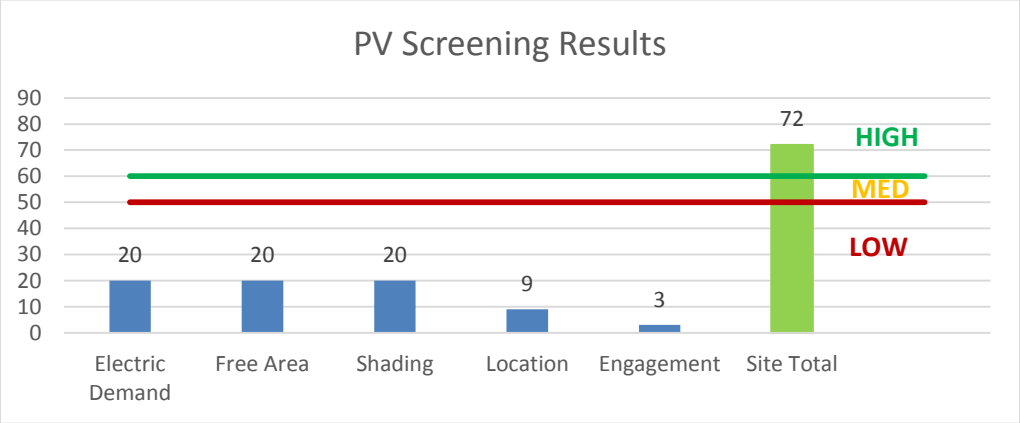
A preliminary screening based on the size and location of free area, and shading elements shows that the township has a High Potential for cost-effective installation of rooftop PV arrays.

Based on our analysis, we estimate that the Manchester Township Municipal Building has about 117,000 square feet of available unshaded ground space.

Total Installed Cost	**$5,691,000**	**$**
Value of Electric Generation per Year	**$256,074.44**	**$**
Annual Income from SRECS	**$178,600.00**	**$**
Total Economic Value per Year	**$434,674.44**	**$**
Simple Payback Period	**13.09**	**years**

We estimate that the available rooftop space could support up to 1,626 kW of solar generating capacity (~5,420 PV panels @300-W_{DC} each).[1] The combined PV array could generate 2,081,906 kWh on an annual basis. This could potentially offset $256,074 of annual electric purchases from the grid. In addition, 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. If the Manchester Township Municipal Building is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 22 - Photovoltaic Screening



The Manchester Township Municipal Building could receive during the first 15 years of the solar project's lifetime, up to $178,600 per year in Solar Renewable Energy Certificate (SREC) income (@ $235/MWh). We estimate that the installed cost of such an array would be about $5.6 million. Based on these numbers, we estimate that such an investment would have a simple payback period of about 13.1 years.

[1] Our estimate was based on the National Renewable Energy Lab's *PVWatts*® Online Calculator (http://pvwatts.nrel.gov/), plus TRC's analysis of current market conditions for commercial solar power development in New Jersey.

Solar projects must register their projects in the SREC Registration Program (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 developed new solar projects and insight into future SREC pricing. Refer to Section 8.3 for additional information.

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

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

6.2 Combined Heat and Power

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.

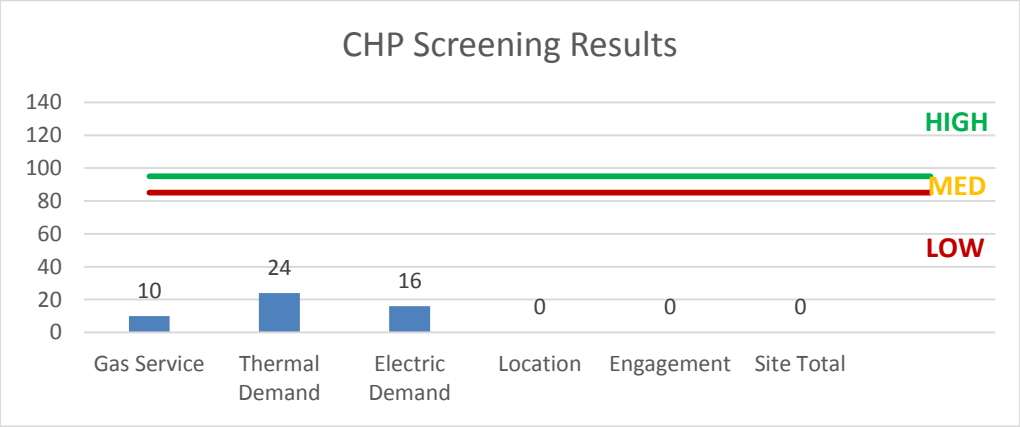
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

Low or infrequent thermal load, and lack of space near the existing boilers are the most significant factors contributing to the low 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 23 - 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 (http://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 (http://www.pjm.com/training/training%20material.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 24 for a list of the eligible programs identified for each recommended ECM.

Figure 24 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install
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
ECM 5	Install Occupancy Sensor Lighting Controls	x		x
ECM 6	Install Daylight Dimming Controls		x	x
ECM 7	Install Pipe Insulation			x
ECM 8	Install Low-Flow Domestic Hot Water Devices			x
ECM 9	Vending Machine Control			x

SmartStart is generally well-suited for implementation of individual 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 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 SmartStart 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.

8.1 SmartStart

Overview

The SmartStart 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 SmartStart prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SmartStart 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 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 Direct Install program you will need to contact the participating contractor who the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install 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 Direct Install offers a free assessment of eligible measures, Direct Install 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 (Solar Renewable Energy Certificate) 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. SRECs 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 SRECs 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 descriptios 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
Charles's office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.20	761	0.0	$93.75	$570.80	$95.00	5.08
Copy room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.30	1,142	0.0	$140.62	$721.20	$125.00	4.24
Joe Veni office	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.40	1,522	0.0	$187.49	$871.60	$155.00	3.82
Joe Veni office	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.03	127	0.0	$15.62	$174.50	$45.00	8.29
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.10	381	0.0	$46.87	$420.40	$65.00	7.58
Drawings room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.20	761	0.0	$93.75	$570.80	$95.00	5.08
Mechanical room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.23	864	0.0	$106.39	$946.80	$170.00	7.30
Admin hallway basement	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.25	960	0.0	$118.21	$1,292.00	$220.00	9.07
Purchasing office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.15	576	0.0	$70.93	$721.20	$125.00	8.41
Purchasing office	7	Compact Fluorescent: 23W CFL	Wall Switch	23	2,600	Relamp	Yes	7	LED Screw-In Lamps: 15W LED	Occupancy Sensor	15	1,820	0.07	266	0.0	$32.79	$492.27	$35.00	13.95
Purchasing file room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.03	96	0.0	$11.82	$191.20	$50.00	11.94
Zoning office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.20	761	0.0	$93.75	$570.80	$95.00	5.08
Zoning office	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Zoning hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.15	571	0.0	$70.31	$495.60	$80.00	5.91
Nicole's office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.10	381	0.0	$46.87	$420.40	$65.00	7.58
Nicole's office	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,600	None	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.01	26	0.0	$3.26	$116.00	$35.00	24.85
Director's office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.10	381	0.0	$46.87	$420.40	$65.00	7.58
Open office area	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	1.09	4,186	0.0	$515.61	$1,924.40	$365.00	3.02
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.10	381	0.0	$46.87	$420.40	$65.00	7.58
Restroom (M)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.03	96	0.0	$11.82	$191.20	$50.00	11.94
Restroom (M)	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.02	69	0.0	$8.45	$191.20	$50.00	16.71
Restroom (L)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.03	96	0.0	$11.82	$191.20	$50.00	11.94
Restroom (L)	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.02	69	0.0	$8.45	$191.20	$50.00	16.71
Exit door	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	102	0.0	$12.62	$107.56	$0.00	8.52
Server room	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.02	69	0.0	$8.45	$345.20	$50.00	34.94

	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
File room	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.28	1,056	0.0	$130.04	$1,367.20	$235.00	8.71
Elevator room	1	Compact Fluorescent: 23W CFL	Wall Switch	23	2,600	Relamp	Yes	1	LED Screw-In Lamps: 15W LED	Occupancy Sensor	15	1,820	0.01	38	0.0	$4.68	$323.75	$35.00	61.65
Hallway code office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.05	192	0.0	$23.64	$420.40	$65.00	15.03
Conference room	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,274	0.03	74	0.0	$9.13	$270.00	$35.00	25.75
Conference room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,820	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,274	0.05	134	0.0	$16.55	$420.40	$65.00	21.47
Office 1	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.15	571	0.0	$70.31	$495.60	$80.00	5.91
DPW Director's office	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,600	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.40	1,522	0.0	$187.49	$871.60	$155.00	3.82
File room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,820	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,274	0.15	400	0.0	$49.22	$495.60	$80.00	8.44
Restroom (M)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.03	96	0.0	$11.82	$191.20	$50.00	11.94
Restroom (L)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.03	96	0.0	$11.82	$191.20	$50.00	11.94
Room 102 hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.08	288	0.0	$35.46	$495.60	$80.00	11.72
Room 102 hallway	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	205	0.0	$25.25	$215.11	$0.00	8.52
Restroom (M)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.03	96	0.0	$11.82	$191.20	$50.00	11.94
Restroom (L)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.03	96	0.0	$11.82	$191.20	$50.00	11.94
Janitor's closet	1	Incandescent: 60W Inc.	Wall Switch	60	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	11	1,820	0.04	159	0.0	$19.60	$345.20	$50.00	15.06
Hallway 102	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.08	288	0.0	$35.46	$495.60	$80.00	11.72
Tax office	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.40	1,536	0.0	$189.14	$1,743.20	$310.00	7.58
Ray Hall office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.08	288	0.0	$35.46	$495.60	$80.00	11.72
Tax assessor's office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.10	384	0.0	$47.29	$570.80	$95.00	10.06
Lobby	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.03	96	0.0	$11.82	$345.20	$50.00	24.97
Lobby	9	Compact Fluorescent: 23W CFL	Wall Switch	23	2,600	Relamp	Yes	9	LED Screw-In Lamps: 15W LED	Occupancy Sensor	15	1,820	0.09	342	0.0	$42.15	$753.78	$35.00	17.05
Lobby	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.08	288	0.0	$35.46	$495.60	$80.00	11.72
Tax collector 101	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,600	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.33	1,271	0.0	$156.53	$646.00	$110.00	3.42
Tax collector 101	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.33	1,248	0.0	$153.68	$1,517.60	$265.00	8.15
Andrea's office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.05	192	0.0	$23.64	$266.40	$65.00	8.52

	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
Andrea's office	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	205	0.0	$25.25	$215.11	$0.00	8.52
Township Clerk office	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.30	1,152	0.0	$141.86	$1,442.40	$250.00	8.41
Municipal Clerk office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,820	0.08	288	0.0	$35.46	$495.60	$80.00	11.72
Councilman's office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	1,820	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,274	0.15	400	0.0	$49.22	$495.60	$80.00	8.44
Councilman's office	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	None	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Councilman's office	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Mayor's office - open area	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,600	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,820	0.58	2,233	0.0	$275.02	$1,221.33	$235.00	3.59
Business admin office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,600	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,820	0.35	1,340	0.0	$165.01	$840.80	$155.00	4.16
Mayor's office	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.33	1,269	0.0	$156.24	$1,125.00	$170.00	6.11
Mayor's office	1	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	102	0.0	$12.62	$107.56	$0.00	8.52
Stairwell	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.10	381	0.0	$46.87	$445.50	$65.00	8.12
Stairwell	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.10	381	0.0	$46.87	$445.50	$65.00	8.12
Stairwell	4	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.03	410	0.0	$50.50	$430.22	$0.00	8.52
Restroom (M)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.03	127	0.0	$15.62	$174.50	$45.00	8.29
Restroom (L)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.03	127	0.0	$15.62	$174.50	$45.00	8.29
Conference room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.10	381	0.0	$46.87	$445.50	$65.00	8.12
Div. of Personnel	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,820	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,274	0.13	355	0.0	$43.75	$504.00	$75.00	9.81
Div. of Personnel	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,820	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,274	0.07	178	0.0	$21.87	$387.00	$55.00	15.18
Office #206	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.07	254	0.0	$31.25	$233.00	$55.00	5.70
Finance office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.27	1,015	0.0	$125.00	$738.00	$115.00	4.98
CFO's office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,820	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,274	0.13	355	0.0	$43.75	$504.00	$75.00	9.81
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,600	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,820	0.06	223	0.0	$27.50	$365.13	$55.00	11.28
Printer room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.03	127	0.0	$15.62	$174.50	$45.00	8.29
Breakroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.03	127	0.0	$15.62	$174.50	$45.00	8.29
Restroom (M)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.03	127	0.0	$15.62	$174.50	$45.00	8.29

	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
Restroom (L)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.03	127	0.0	$15.62	$174.50	$45.00	8.29
Hallway	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,600	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,820	0.23	888	0.0	$109.37	$679.50	$105.00	5.25
Hallway Exit	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Sally port	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.13	1,710	0.0	$210.57	$504.00	$75.00	2.04
Mechanical room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Gym	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.40	5,129	0.0	$631.71	$1,242.00	$190.00	1.67
Armory	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	8,760	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,132	0.12	1,505	0.0	$185.32	$730.27	$110.00	3.35
Sally port jail	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	8,760	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,132	0.23	3,009	0.0	$370.64	$920.53	$150.00	2.08
Sally port jail	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Classroom	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.27	3,419	0.0	$421.14	$1,008.00	$150.00	2.04
Lounge	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.20	2,564	0.0	$315.85	$891.00	$130.00	2.41
IT Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.15	1,921	0.0	$236.58	$387.00	$55.00	1.40
Locker room	12	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.40	5,129	0.0	$631.71	$972.00	$155.00	1.29
Locker room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	8,760	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,132	0.12	1,505	0.0	$185.32	$460.27	$75.00	2.08
Shower	1	Incandescent: 60W	Wall Switch	60	8,760	Relamp	Yes	1	LED Screw-In Lamps: 15W LED Retrofit Kit	Occupancy Sensor	15	6,132	0.04	507	0.0	$62.49	$323.75	$40.00	4.54
Restroom (M)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Restroom (M)	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	8,760	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	6,132	0.06	721	0.0	$88.75	$239.40	$65.00	1.97
Restroom (L)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Restroom (L)	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	8,760	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	6,132	0.06	721	0.0	$88.75	$239.40	$65.00	1.97
Hallway basement	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.17	2,137	0.0	$263.21	$562.50	$85.00	1.81
Hallway basement	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Hallway basement	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	8,760	Relamp	Yes	1	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	6,132	0.03	360	0.0	$44.37	$177.70	$50.00	2.88
Vestibule	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.03	427	0.0	$52.64	$328.50	$45.00	5.39
Lobby	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.13	1,710	0.0	$210.57	$504.00	$75.00	2.04
Interview room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.03	427	0.0	$52.64	$328.50	$45.00	5.39

	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
Detention room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.13	1,710	0.0	$210.57	$504.00	$75.00	2.04
Prisoner processing	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.13	1,710	0.0	$210.57	$504.00	$75.00	2.04
Sally Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	8,760	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,132	0.29	3,761	0.0	$463.30	$745.67	$135.00	1.32
Prisoner processing #3	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.13	1,710	0.0	$210.57	$504.00	$75.00	2.04
Holding cell	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	8,760	Fixture Replacement	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,132	0.43	5,551	0.0	$683.72	$603.84	$35.00	0.83
Restroom (M)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Restroom (M)	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	8,760	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	6,132	0.06	721	0.0	$88.75	$239.40	$65.00	1.97
Restroom (L)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Restroom (L)	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	8,760	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	6,132	0.06	721	0.0	$88.75	$239.40	$65.00	1.97
1st floor hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.30	3,847	0.0	$473.78	$1,066.50	$160.00	1.91
1st floor hallway	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	8,760	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	6,132	0.06	721	0.0	$88.75	$393.40	$65.00	3.70
1st floor hallway	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Commander's office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.13	1,710	0.0	$210.57	$504.00	$75.00	2.04
Control room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.23	2,992	0.0	$368.50	$949.50	$140.00	2.20
Control room	2	Incandescent: 60W Inc.	Wall Switch	60	8,760	Relamp	Yes	2	LED Screw-In Lamps: 11W LED Retrofit Kit	Occupancy Sensor	11	6,132	0.08	1,072	0.0	$132.05	$377.51	$45.00	2.52
Lt. Komsa	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.17	2,137	0.0	$263.21	$562.50	$85.00	1.81
Hallway	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	205	0.0	$25.25	$215.11	$0.00	8.52
Muster room	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.50	6,411	0.0	$789.64	$1,417.50	$220.00	1.52
Locker room	2	Compact Fluorescent: 13W CFL	Wall Switch	13	8,760	Relamp	Yes	2	LED Screw-In Lamps: 8W LED	Occupancy Sensor	8	6,132	0.01	152	0.0	$18.68	$223.51	$35.00	10.09
IT Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.03	427	0.0	$52.64	$174.50	$45.00	2.46
Records room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.40	5,129	0.0	$631.71	$1,242.00	$190.00	1.67
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Lt. Sharky	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Investigation bureau	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.53	6,838	0.0	$842.28	$1,476.00	$230.00	1.48

	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
Narcotics	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.13	1,710	0.0	$210.57	$504.00	$75.00	2.04
Detective sergeant	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.13	1,710	0.0	$210.57	$504.00	$75.00	2.04
Lt. office 1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.10	1,282	0.0	$157.93	$445.50	$65.00	2.41
Lt. office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Common area	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Lt. office 3	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.20	2,564	0.0	$315.85	$621.00	$95.00	1.67
Chief of police	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.27	3,419	0.0	$421.14	$1,008.00	$150.00	2.04
Chief of police aide	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.10	1,282	0.0	$157.93	$445.50	$65.00	2.41
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Conference room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.10	1,282	0.0	$157.93	$445.50	$65.00	2.41
Conference room	14	Compact Fluorescent: 13W CFL	Wall Switch	13	8,760	Relamp	Yes	14	LED Screw-In Lamps: 8W LED	Occupancy Sensor	8	6,132	0.08	1,062	0.0	$130.79	$1,292.54	$70.00	9.35
Pantry	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$55.00	1.69
Captain's office	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.30	3,847	0.0	$473.78	$796.50	$125.00	1.42
Interview room 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$387.00	$55.00	3.15
Interview room 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$387.00	$55.00	3.15
Traffic safety office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.03	427	0.0	$52.64	$174.50	$45.00	2.46
Traffic safety office	4	Compact Fluorescent: 13W CFL	Wall Switch	26	8,760	Relamp	Yes	4	LED Screw-In Lamps: 8W LED	Occupancy Sensor	16	6,132	0.05	607	0.0	$74.73	$546.02	$35.00	6.84
Hallway 2nd floor	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.36	4,701	0.0	$579.07	$1,183.50	$180.00	1.73
Hallway 2nd floor	3	Exit Signs: Fluorescent	Wall Switch	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Civic center	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.60	2,740	0.0	$337.49	$1,593.00	$250.00	3.98
Storage	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	3,120	Fixture Replacement	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,184	0.11	494	0.0	$60.88	$353.46	$35.00	5.23
Exit door	4	Exit Signs: Fluorescent	None	16	3,120	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	3,120	0.03	146	0.0	$17.98	$430.22	$0.00	23.92
Civic kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,120	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.07	304	0.0	$37.50	$233.00	$55.00	4.75
Breakroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	3,120	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.10	457	0.0	$56.25	$445.50	$65.00	6.76
Basement hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.17	761	0.0	$93.75	$562.50	$85.00	5.09

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 303	8	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	3,120	Relamp	Yes	8	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	2,184	0.22	1,026	0.0	$126.43	$763.60	$155.00	4.81
Hallway exit	6	Exit Signs: Fluorescent	None	16	3,120	Fixture Replacement	No	6	LED Exit Signs: 2 W Lamp	None	6	3,120	0.05	219	0.0	$26.98	$645.33	$0.00	23.92
Restroom (L)	3	Incandescent: 60W	Wall Switch	60	3,120	Relamp	Yes	1	LED Screw-In Lamps: 15W LED Retrofit Kit	Occupancy Sensor	15	2,184	0.13	619	0.0	$76.21	$431.26	$50.00	5.00
Restroom (M)	2	Incandescent: 60W	Wall Switch	60	3,120	Relamp	Yes	1	LED Screw-In Lamps: 15W LED Retrofit Kit	Occupancy Sensor	15	2,184	0.09	400	0.0	$49.23	$223.51	$10.00	4.34
IT Room (basement)	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.17	761	0.0	$93.75	$562.50	$85.00	5.09
IT Room (basement) storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.07	304	0.0	$37.50	$233.00	$20.00	5.68
Bldg and grounds office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.10	457	0.0	$56.25	$445.50	$65.00	6.76
Violations bureau	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.40	1,827	0.0	$224.99	$1,242.00	$190.00	4.68
Violations bureau	3	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	3,120	Relamp	Yes	3	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	2,184	0.08	385	0.0	$47.41	$301.10	$45.00	5.40
Dep. Court admin	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.07	304	0.0	$37.50	$233.00	$20.00	5.68
Dep. Court admin	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,120	Relamp	Yes	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.02	80	0.0	$9.82	$151.90	$5.00	14.95
Dep. Court admin	2	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	205	0.0	$25.25	$215.11	$0.00	8.52
Courtroom	14	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch	110	3,120	Fixture Replacement	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,184	0.77	3,547	0.0	$436.86	$3,373.32	$70.00	7.56
Courtroom	3	Exit Signs: Fluorescent	None	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Courtroom Lobby	12	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	3,120	Relamp	No	12	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	3,120	0.26	1,205	0.0	$148.38	$740.40	$180.00	3.78
Courtroom Lobby	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	3,120	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,120	0.05	234	0.0	$28.78	$192.80	$40.00	5.31
Vicitim wait room	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	3,120	Fixture Replacement	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,120	0.19	861	0.0	$106.11	$166.92	$0.00	1.57
Courthousr ext.	3	Incandescent: 40W	Wall Switch	120	3,120	LED Retrofit	Yes	3	LED Screw-In Lamps: 15W LED	Daylight Dimming	15	1,560	0.27	1,232	0.0	$151.75	$310.00	$135.00	1.15
Judge's office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.07	304	0.0	$37.50	$233.00	$20.00	5.68
Court Admin	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	3,120	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,184	0.12	536	0.0	$66.00	$460.27	$75.00	5.84
Storage file room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.07	304	0.0	$37.50	$233.00	$20.00	5.68
Kitchen	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,120	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.07	319	0.0	$39.30	$259.60	$20.00	6.10
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,120	Relamp	Yes	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.02	80	0.0	$9.82	$151.90	$5.00	14.95
Courtroom Hallway	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	3,120	Relamp	No	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	3,120	0.04	201	0.0	$24.73	$123.40	$30.00	3.78
Courtroom Hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.08	361	0.0	$44.51	$175.50	$30.00	3.27

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Exit door	3	Exit Signs: Fluorescent	Wall Switch	16	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.02	307	0.0	$37.87	$322.67	$0.00	8.52
Police SWAT room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.20	2,564	0.0	$315.85	$621.00	$95.00	1.67
Sarg. Locker	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.07	855	0.0	$105.28	$233.00	$20.00	2.02
Restroom	2	Incandescent: 60W	Wall Switch	60	8,760	Relamp	Yes	1	LED Screw-In Lamps: 15W LED Retrofit Kit	Occupancy Sensor	15	6,132	0.09	1,122	0.0	$138.23	$223.51	$10.00	1.54
Restroom	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	8,760	Fixture Replacement	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.11	1,388	0.0	$170.93	$436.86	$35.00	2.35
Recreation Dept.	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	8,760	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,132	0.58	7,523	0.0	$926.61	$1,491.33	$270.00	1.32
Recreation Dept.	2	Exit Signs: Fluorescent	Wall Switch	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.02	205	0.0	$25.25	$215.11	$0.00	8.52
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	8,760	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,132	0.12	1,505	0.0	$185.32	$460.27	$75.00	2.08
Closet	2	Exit Signs: Fluorescent	Wall Switch	16	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.02	205	0.0	$25.25	$215.11	$0.00	8.52
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	8,760	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,132	0.06	752	0.0	$92.66	$211.13	$20.00	2.06
Ext restroom	1	Compact Fluorescent: 23W CFL	Wall Switch	23	8,760	Relamp	No	1	LED Screw-In Lamps: 15W LED	Wall Switch	15	8,760	0.01	82	0.0	$10.10	$53.75	$0.00	5.32
Exterior	2	Induction: 1000W	Wall Switch	1,000	4,380	Fixture Replacement	Yes	2	LED - Fixtures: Architectural Flood/Spot Luminaire	Daylight Dimming	146	2,190	1.48	9,501	0.0	$1,170.25	$2,699.90	$190.00	2.14
Parking lots	21	Metal Halide: (1) 400W Lamp	Wall Switch	458	4,380	Fixture Replacement	Yes	21	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	90	2,190	6.90	44,446	0.0	$5,474.43	$46,262.85	$3,045.00	7.89

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
Boiler room	All	8	Heating Hot Water Pump	1.2	85.5%	Yes	2,745	No	85.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Basement	Civic Center	1	Supply Fan	1.5	84.0%	No	2,745	Yes	86.5%	Yes	1	0.45	1,336	0.0	$164.61	$3,380.15	$120.00	19.81
Attic	Police HQ	1	Supply Fan	2.4	84.0%	No	2,745	Yes	86.5%	Yes	1	0.73	2,138	0.0	$263.37	$3,623.09	$192.00	13.03
Attic	Basement offices	1	Supply Fan	2.4	84.0%	No	2,745	Yes	86.5%	Yes	1	0.73	2,138	0.0	$263.37	$3,623.09	$192.00	13.03
Attic	Courtroom	1	Supply Fan	2.4	84.0%	No	2,745	Yes	86.5%	Yes	1	0.73	2,138	0.0	$263.37	$3,623.09	$192.00	13.03
Boiler room	Basement	1	Supply Fan	1.5	84.0%	No	2,745	Yes	86.5%	Yes	1	0.45	1,336	0.0	$164.61	$3,380.15	$120.00	19.81
Attic	Police HQ	1	Supply Fan	2.0	84.0%	No	2,745	Yes	86.5%	Yes	1	0.61	1,782	0.0	$219.47	$3,623.09	$160.00	15.78
Attic	1st Floor	1	Supply Fan	2.0	84.0%	No	2,745	Yes	86.5%	Yes	1	0.61	1,782	0.0	$219.47	$3,623.09	$160.00	15.78
Police Basement	Gym	1	Supply Fan	0.5	82.5%	No	2,745	No	82.5%	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
Outside Police Staion (Southeast wall)	Courtroom	1	Split-System AC	9.83		Yes	1	Split-System AC	9.83		11.50		No	0.80	1,627	0.0	$200.42	$11,439.86	$717.59	53.50
Outside Police Staion (Southeast wall)	Police Station	1	Split-System AC	9.83		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside Police Staion (Southeast wall)	Police Station (FL 1 and 2)	1	Split-System AC	15.33		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside Police Staion (Southeast wall)	Gym	1	Split-System AC	4.50		Yes	1	Split-System AC	4.50		14.00		No	1.94	4,212	0.0	$518.80	$6,732.99	$414.00	12.18
Outside Police Staion (Southeast wall)	Basement	1	Split-System AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside Police Staion (Southeast wall)	Civic Center	1	Split-System AC	15.00		Yes	1	Split-System AC	15.00		11.50		No	4.22	8,549	0.0	$1,053.00	$17,397.73	$1,185.00	15.40
Outside Police Staion (Southeast wall)	IT Room	1	Split-System AC	2.85		Yes	1	Split-System AC	2.85		14.00		No	0.68	1,373	0.0	$169.12	$4,264.23	$262.20	23.66
Interior spaces	Offices	60	Packaged Terminal AC	0.75		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Interior spaces	Offices	10	Packaged Terminal AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Interior spaces	Offices	4	Packaged Terminal AC	1.25		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
Boiler Room	All	5	Condensing Hot Water Boiler	235.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	All	2	Condensing Hot Water Boiler	317.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Pipe Insulation Recommendations

		Recommendation Inputs		Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	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
Boiler Room	HW Boilers	50	2.00	0.00	0	14.8	$184.09	$217.50	$0.00	1.18

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
Boiler Room	2nd floor	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	1st Floor/Basement	1	Indirect System	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
Restroom	42	Faucet Aerator (Lavatory)	2.50	1.00	0.00	3,787	0.0	$466.50	$301.14	$0.00	0.65

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Munipal Building	138	Desktop Computer	75.0	Yes
Munipal Building	19	Small Printer	100.0	No
Munipal Building	12	Medium Printer	250.0	Yes
Munipal Building	11	Large Printer	515.0	Yes
Munipal Building	2	Paper Shredder	360.0	No
Munipal Building	6	Microwave	1,000.0	No
Munipal Building	2	Small Refrigerator	50.0	No
Munipal Building	8	Medium Refrigerator	600.0	No
Munipal Building	1	Large Refrigerator	750.0	No
Munipal Building	3	Coffee Machine	400.0	No
Munipal Building	2	Toaster	850.0	No
Munipal Building	18	CRT (42")	120.0	No
Munipal Building	2	Plasma (42")	220.0	No
Munipal Building	1	LCD(50")	100.0	No
Munipal Building	1	Electric Range	2,000.0	No

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Basement Break Room	1	Refrigerated	Yes	0.00	1,612	0.0	$198.53	$230.00	$0.00	1.16

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

N/A

ENERGY STAR® Score[1]

Municipal Building (Police/EOC)

Primary Property Type: Mixed Use Property
Gross Floor Area (ft²): 98,364
Built: 1967

For Year Ending: March 31, 2016
Date Generated: September 05, 2017

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Municipal Building (Police/EOC) 1 Colonial Drive Manchester, New Jersey 08759	_____ . (___)___-_____	____ _____ . (___)___-_____ _____

Property ID: 6031167

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
37.7 kBtu/ft²

Source EUI
89.1 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	1,370,542 (37%)
Electric - Grid (kBtu)	2,333,659 (63%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	52
National Median Source EUI (kBtu/ft²)	123.1
% Diff from National Median Source EUI	-28%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	332

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

____ _____
,
(___)___-_____
_____

Professional Engineer Stamp (if applicable)