Local Government Energy Audit:
Energy Audit Report

City Hall

City of Jersey City
280 Grove Street
Jersey City, NJ 07302

February 19, 2018

Final Report by:
TRC Energy Services

Disclaimer

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

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

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

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

Table of Contents

Table of Figures

1 EXECUTIVE SUMMARY

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

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

1.1 Facility Summary

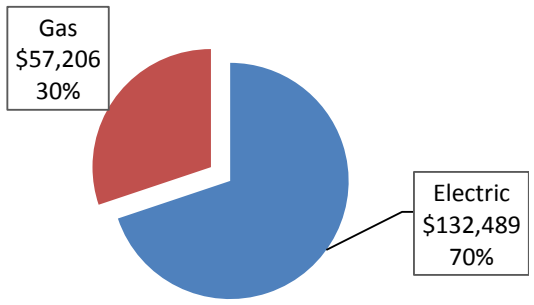
City Hall is a 100,000 square foot building comprised of office spaces, small kitchens, and conference rooms. The building has four (4) floors including a basement. The building was originally built in 1896 and contains old, inefficient lighting and a building envelope with excessive air infiltration. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

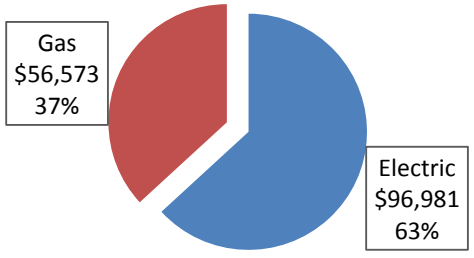
TRC evaluated seven (7) projects that represent an opportunity for City Hall to reduce annual energy costs by roughly $29,612 and annual greenhouse gas emissions by 173,330 lbs CO^2e. The measures will pay for themselves in roughly 3.7 years. The breakdown of existing and potential utility costs is illustrated in Figure 1 and Figure 2, respectively. These projects represent an opportunity to reduce City Hall's annual energy use by 6.9%.

Figure 1 – Previous 12 Month Utility Costs



$189,695

Figure 2 – Potential Post-Implementation Costs



$153,553

A detailed description of City Hall's existing energy use is in Section 3.

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

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**146,430**	**53.2**	**0.0**	**$25,952.87**	**$105,761.49**	**$2,915.00**	**$102,846.49**	**3.96**	**147,453**
ECM 1	Install LED Fixtures	Yes	941	0.2	0.0	$166.80	$781.35	$200.00	$581.35	3.49	948
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	111,058	42.9	0.0	$19,683.62	$82,644.92	$615.00	$82,029.92	4.17	111,834
ECM 3	Retrofit Fixtures with LED Lamps	Yes	18,989	8.8	0.0	$3,365.53	$18,033.01	$2,100.00	$15,933.01	4.73	19,122
ECM 4	Install LED Exit Signs	Yes	15,442	1.3	0.0	$2,736.93	$4,302.20	$0.00	$4,302.20	1.57	15,550
Lighting Control Measures			**17,071**	**6.3**	**0.0**	**$3,025.72**	**$7,130.00**	**$1,415.00**	**$5,715.00**	**1.89**	**17,191**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	16,657	6.2	0.0	$2,952.23	$6,380.00	$1,100.00	$5,280.00	1.79	16,773
ECM 6	Install Daylight Dimming Controls	Yes	415	0.1	0.0	$73.48	$750.00	$315.00	$435.00	5.92	418
Domestic Water Heating Upgrade			**0**	**0.0**	**74.2**	**$633.16**	**$257.47**	**$0.00**	**$257.47**	**0.41**	**8,685**
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	74.2	$633.16	$257.47	$0.00	$257.47	0.41	8,685
Food Service Equipment & Refrigeration Measures			**0**	**0.0**	**0.0**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**0.00**	**0**
TOTALS			**163,501**	**59.5**	**74.2**	**$29,611.75**	**$113,148.96**	**$4,330.00**	**$108,818.96**	**3.67**	**173,330**

* - 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 conditions allow. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

Domestic Water Heating upgrade measures generally involve replacing old inefficient domestic water heating systems with modern energy efficient systems. New domestic water heating systems can provide equivalent or greater capacity as older systems, but use less energy. These measures save energy by reducing the fuel used by the domestic water heating systems due to improved efficiency or the removal of standby losses.

Energy Efficient Practices

TRC also identified nine (9) no (or low) cost energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral and operational adjustments as well as performing routine maintenance on building systems. Through these practices equipment lifetime can be extended; occupant comfort, health, and safety can be improved; and annual energy, operation, and maintenance costs can be reduced. Opportunities identified at City Hall include:

- Close Doors and Windows
- Use Window Treatments/Coverings
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Use Fans to Reduce Cooling Load
- Clean and/or Replace HVAC Filters
- Perform Proper Boiler Maintenance

- Install Plug Load Controls
- Water Conservation

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

Self-Generation Measures

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

Figure 4 – Photovoltaic Potential

Potential	None	
System Potential	27	kW DC STC
Electric Generation	32,167	kWh/yr
Displaced Cost	$2,800	/yr
Installed Cost	$70,200	

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

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, the equipment changes outlined for each ECM need to be selected and installed through project implementation. One of the first considerations is if there is capital available for project implementation. Another consideration is whether to pursue individual ECMs, a group of ECMs, or a comprehensive approach wherein all ECMs are pursued, potentially in conjunction with other facility projects or improvements.

Rebates, incentives, and financing are available from the NJBPU, NJCEP, as well as some of the state's investor-owned utilities, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any project, please review the appropriate incentive program guidelines before proceeding. This is important because in most cases you will need to submit an application for the incentives before purchasing materials and beginning installation.

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

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

For facilities with capital available for implementation of selected individual measures or phasing 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 design the ECM(s), select the equipment and apply for the incentive(s). Program pre-approval is required for some SmartStart incentives, so only after receiving approval may the ECM(s) be installed. The incentive values listed above in Figure 3 represent the SmartStart program and will be explained further in Section 8, as well as the other programs as mentioned below.

For facilities with capital available and an interest in a comprehensive, holistic approach to energy conservation should consider participating in the P4P EB program. This program has minimum savings requirements and the incentives are based on actual measured performance savings. The application

process is more involved and requires working with an eligible contractor, but may result in more lucrative incentives up to 50% of total project cost.

For facilities without capital available 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 external project development, design, and implementation services as well as financing for implementing ECMs. This LGEA report is the first step for participating in ESIP and should help you determine next steps. Refer to Section 8.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a program (non-NJCEP) designed to reduce consumer electric load when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for Mid-Atlantic-state region that is charged with maintaining electric grid reliability locally. By enabling grid operators to call upon Curtailment Service Providers and energy consumers to reduce electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and participants will receive payments whether or not their facility is called upon to curtail their load. Refer to Section 8 for additional information on this program.

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

To ensure projects are implemented such that maximum savings and incentives are achieved, bids and specifications should be reviewed by your procurement personnel and/or consultant(s) to ensure that selected equipment coincides with LGEA recommendations, as well as applicable incentive program guidelines and requirements.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
John Mercer	Assistant Business Administrator	jmercer@jcnj.org	201-547-4417
TRC Energy Services			
Smruti Srinivasan	Auditor	ssrinivasan@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On July 12th and 13th, 2016, TRC performed an energy audit at City Hall located in Jersey City, New Jersey. TRC's team met with Adalberto Ortiz to review the facility operations and focus the investigation on specific energy-using systems.

City Hall is a 100,000 square foot facility that is mostly comprised of office spaces, small kitchens, and conference rooms. The building has four (4) floors including a basement. The building was originally built in 1896 and contains old and inefficient lighting and building envelope with excessive air infiltration.

2.3 Building Occupancy

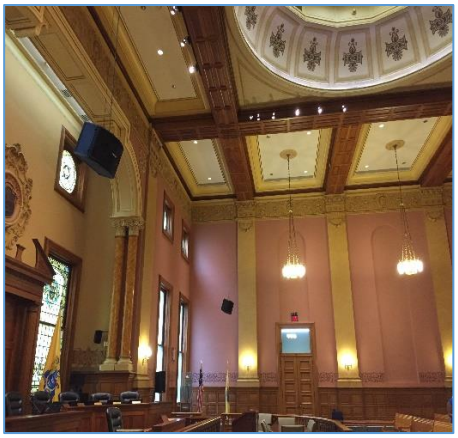
The typical schedule is presented in the table below. As most parts of the building are office spaces with or without public access, the occupancy is within the specified timings and round the year. The basement of the building is used largely for storage purposes by the maintenance personnel, and hence might have some excess operations.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
City Hall	Weekday	7AM - 5PM
City Hall	Weekend	No occupancy

2.4 Building Envelope

The building is constructed of concrete and structural steel with a stone façade. The building has a flat roof in the center, covered with black membrane and inclined roofs at the corners. The building has a combination of large single and double pane windows (cracked in some of the rooms), which leads to excessive infiltration. Parts of the building, such as the Council of Chambers, have new stained glass windows as they were redeveloped recently. The exterior doors are constructed of aluminum and are in good condition.



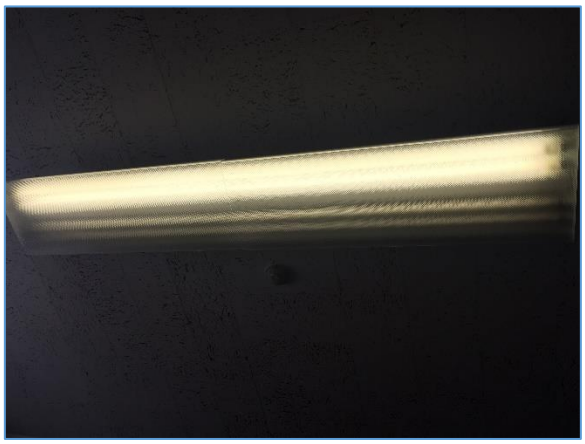
2.5 On-site Generation

City Hall does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

Lighting System

Lighting is a mixture of linear 44-Watt fluorescent T12 lamps with magnetic ballasts, U-bent T12 fluorescents, incandescent lamps, and compact fluorescent lamps (CFL). Most of the building spaces use 2-foot, 4-foot or 8-foot fixtures. It was observed that some of these tubes were discolored and very old. Office lighting levels varied widely, from 11 to 30 footcandles. Future lighting renovation work should provide lighting levels in accordance with IESNA and building code requirements The lumens in some of the office spaces were either as high as 30 footcandles or as low as 11 foot-cd. The building did not seem to have had any lighting retrofits done recently except the Council of Chambers portion, which has LEDs already installed. Wall switches provide lighting control in most spaces.



The building has minimal exterior lighting, primarily consisting of high-pressure sodium fixtures and CFL lamp fixtures, which are observed to go out very often.

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

Hot Water / Steam System

The heating hot water system consists of one (1) HB Smith non-condensing boiler with an output capacity of 5994 MBH and an efficiency of 80.6%. The boiler is ten (10) years old and heats most of the building via radiators. The boiler is in good condition and is also well maintained. Occupants cannot control the temperature of their environment through conventional means such as thermostats. As a result of this overheating of many office spaces were observed. As a result, occupants open windows to cool their workspaces. Although the heating system seems to be efficient, the building envelope and lack of control system leads to overheating of the office spaces.

Air Conditioning (DX)

The air conditioning in the City Hall building is provided using various systems such as the packaged rooftop AC units, heat pumps, split systems, and window AC units.

The rooftop units are 19.8 ton AAON systems with a SEER of 11.50. The other major unit is the ten (10) ton split system heat pump from TRANE. The system has a heating capacity of 119 kbtu/hr and a SEER of 10.3. This unit was installed (replaced the previously existing unit) about four (4) years ago and, along with another two (2) ton ductless mini-split heat pump, serves the Human Resources department. These are in good condition.

The other individual office spaces are mostly cooled by window AC units. There are approximately 70 window AC units installed at City Hall, all have various remaining lives. Some of them are ENERGY STAR® rated equipment. Some occupants have complaints of the cooling being insufficient as there is solar heat gain which affects the space temperatures significantly. Auditors also observed during the visit was the cracked windows that are covered by sheets through which the cooled air escapes. This is a potential problem in the winter as well when the heating system serves the area.

The replacement options for the window AC units were evaluated but they were very expensive and the payback periods were more than the life of the units. The savings on these were marginally low as well. As a result, it is recommended that the window AC units be replaced with the highest SEER unit available when they come to the end of their useful life. It would also be wise to consider zoning the offices and have mini/multi-split units with temperature control features. It is not feasible to have early replacements on the existing window AC units.

Domestic Hot Water

The domestic hot water system-consists of two (2) RheemGlas electric boilers with an input rating of 2kW and 4kW. The tank capacities are 20 and 80 gallons respectively. The smaller unit was installed in 2005 and the large unit, in 2012. They are well maintained and in good working condition.

Food Service & Laundry Equipment

The building does not have a commercial kitchen, however, there are small pantries within the offices that contain food preparation equipment such as toasters, toaster ovens, coffee machines, microwave ovens, and refrigerators (all sizes). Since there were a number of units observed at the facility, it is recommended that they be replaced with ENERGY STAR® rated appliances when they reach the end of their useful life. There was no laundry equipment observed at the facility.

Plug Load & Vending Machines

There are roughly 260 computer workstations throughout the facility. There is no centralized PC power management software installed. Other plug loads include printers, water dispensers, televisions, kettles, air coolers, and space heaters.

All server closets have cooling provided by dedicated AC units. There is one (1) refrigerated and one (1) non-refrigerated vending machine at the facility.

2.7 Water-Using Systems

There are about 17 restrooms at this facility. The restrooms faucets are rated for 2.5 gallons per minute (gpm) or higher. Areas such as the boiler rooms and basement room have sinks that have higher flow rates. Simple measure for the faucets, would be to install low-flow aerators that limit water flow through the faucets and reduce water use.

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/ft^2 and energy use/ft^2. These energy use indices are indicative of the relative energy effectiveness of this building. There are a number of factors that could cause the energy use of this building to vary from the "typical" energy use for other facilities identified as a State Facility. Specific local climate conditions, daily occupancy hours of the facility, seasonal fluctuations in occupancy, daily operating hours of energy use systems, and the behavior of the occupants with regard to operating systems that impact energy use such as turning off appliances and leaving windows open. Please refer to the Benchmarking section within Section 3.4 for additional information.

3.1 Total Cost of Energy

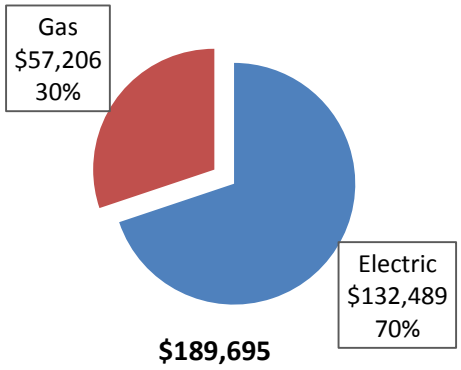
The following energy consumption and cost data are based on the last 12 month period of utility usage data that was provided for each utility. The annual consumption and cost were developed from this information.

Figure 7 - Utility Summary

Utility Summary for City Hall		
Fuel	**Usage**	**Cost**
Electricity	707,600 kWh	$132,489
Natural Gas	67,020 Therms	$57,206
Total		**$189,695**

The current utility cost for this site is $189,695 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost (combined for commodity, transmission and distribution) for the past 12 months is $0.177/kWh, which is the blended rate used throughout the analyses in this report. The third party supply is provided by Constellation Energy. The monthly electricity consumption and peak demand is represented graphically in the chart below.

Figure 9 - Electric Usage & Demand

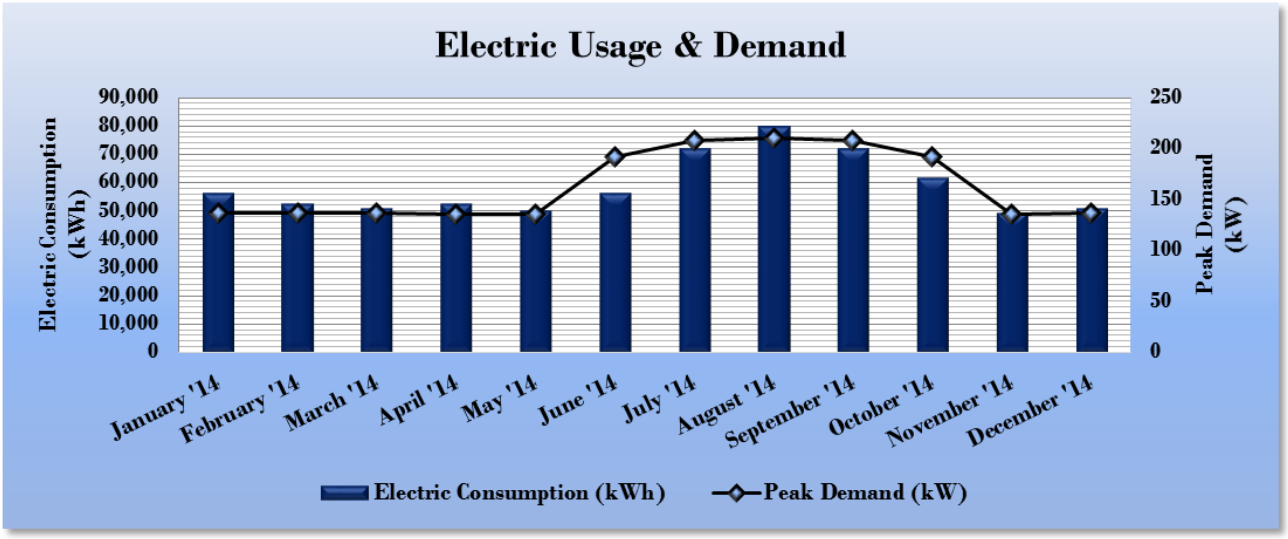


Figure 10 - Electric Usage & Demand

Electric Billing Data for City Hall						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
2/2/14	28	56,400	137	$491	$9,196	Yes
3/2/14	31	52,800	137	$494	$8,942	Yes
4/2/14	30	51,200	137	$491	$8,729	Yes
5/2/14	31	52,800	136	$491	$8,897	Yes
6/2/14	30	50,400	135	$488	$8,907	Yes
7/2/14	31	56,400	192	$690	$11,937	Yes
8/2/14	31	72,400	208	$749	$15,177	Yes
9/2/14	30	80,000	211	$760	$16,448	Yes
10/2/14	31	72,400	208	$749	$15,550	Yes
11/2/14	30	62,000	192	$690	$11,135	Yes
12/2/14	31	49,600	136	$491	$8,744	Yes
1/2/15	31	51,200	137	$491	$8,827	Yes
Totals	**365**	**707,600**	**211**	**$7,076**	**$132,489**	
Annual	**365**	**707,600**	**211**	**$7,076**	**$132,489**	

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is $0.854/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is represented graphically in the chart below.

Figure 11 - Natural Gas Usage

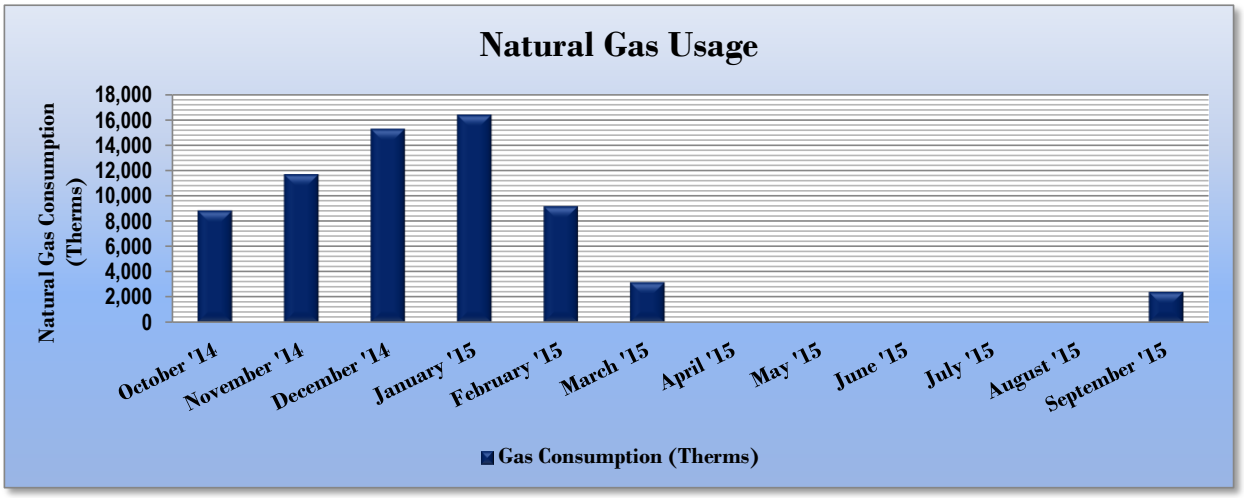


Figure 12 - Natural Gas Usage

Gas Billing Data for City Hall				
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost	TRC Estimated Usage?
11/3/14	31	8,803	$8,377	No
12/4/14	31	11,664	$10,964	No
1/6/15	29	15,264	$12,963	No
2/4/15	30	16,370	$13,256	No
3/6/15	32	9,162	$5,486	No
4/7/15	29	3,163	$1,856	No
5/6/15	30	0	$103	No
6/5/15	32	0	$103	No
7/7/15	29	0	$103	No
8/5/15	31	0	$103	No
9/4/15	30	0	$103	No
10/5/15	30	2,411	$3,630	No
Totals	**364**	**66,837**	**$57,049**	0
Annual	**365**	**67,020**	**$57,206**	

3.4 Benchmarking

This facility was benchmarked through 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 compares its performance against a yearly baseline, national medians, or similar buildings in your portfolio. Metrics used in this comparison are the energy use intensity (EUI) and ENERGY STAR® score.

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 energy than similar buildings on a square foot basis or if that building performs better than the median. EUI is presented in both 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 is the raw fuel consumed to generate the energy consumed at the site, factoring in energy production and distribution losses.

Figure 13 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	City Hall	National Median Building Type: State Facility
Source Energy Use Intensity (kBtu/ft^2)	146.2	169.9
Site Energy Use Intensity (kBtu/ft^2)	91.2	93.2

By implementing all recommended measures covered in this reporting, the Project's estimated post-implementation EUI improves as shown in the table below:

Figure 14 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

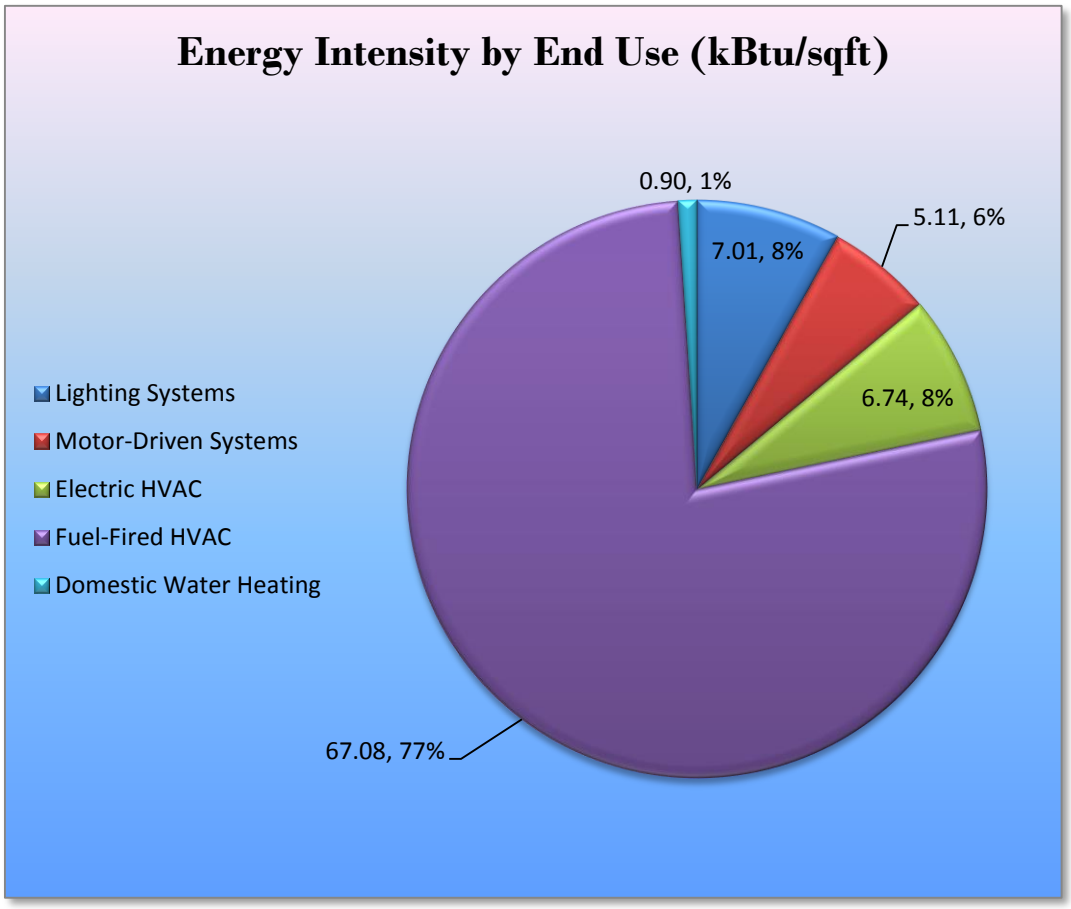
Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	City Hall	National Median Building Type: State Facility
Source Energy Use Intensity (kBtu/ft^2)	127.9	169.9
Site Energy Use Intensity (kBtu/ft^2)	84.8	93.2

This building type does not currently qualify to receive a score due to missing or incomplete data.

3.5 Energy End-Use Breakdown

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

Figure 15 - Energy Balance (kBtu/SF and % of tota)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy projects, help prioritize specific measures for implementation, and set City Hall on the path to receive financial incentives. 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 considered sufficient to make decisions and to prioritize energy projects. Savings are based on the New Jersey Board of Public Utilities New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016. Further analysis or investigation may be required to calculate more accurate savings to support any custom SmartStart, Pay for Performance, or Large Energy Users incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJ prescriptive SmartStart program. Depending on your implementation strategy, the project may be eligible for more lucrative incentives through other programs as identified 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 16 – Summary of Recommended ECMs

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
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ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	111,058	42.9	0.0	$19,683.62	$82,644.92	$615.00	$82,029.92	4.17	111,834
ECM 3	Retrofit Fixtures with LED Lamps	Yes	18,989	8.8	0.0	$3,365.53	$18,033.01	$2,100.00	$15,933.01	4.73	19,122
ECM 4	Install LED Exit Signs	Yes	15,442	1.3	0.0	$2,736.93	$4,302.20	$0.00	$4,302.20	1.57	15,550
Lighting Control Measures			**17,071**	**6.3**	**0.0**	**$3,025.72**	**$7,130.00**	**$1,415.00**	**$5,715.00**	**1.89**	**17,191**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	16,657	6.2	0.0	$2,952.23	$6,380.00	$1,100.00	$5,280.00	1.79	16,773
ECM 6	Install Daylight Dimming Controls	Yes	415	0.1	0.0	$73.48	$750.00	$315.00	$435.00	5.92	418
Domestic Water Heating Upgrade			**0**	**0.0**	**74.2**	**$633.16**	**$257.47**	**$0.00**	**$257.47**	**0.41**	**8,685**
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	74.2	$633.16	$257.47	$0.00	$257.47	0.41	8,685
Food Service Equipment & Refrigeration Measures			**0**	**0.0**	**0.0**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**0.00**	**0**
TOTALS			**163,501**	**59.5**	**74.2**	**$29,611.75**	**$113,148.96**	**$4,330.00**	**$108,818.96**	**3.67**	**173,330**

* - 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

Lighting upgrades include several sub-measures as outlined in Figure 17 below.

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**146,430**	**53.2**	**0.0**	**$25,952.87**	**$105,761.49**	**$2,915.00**	**$102,846.49**	**3.96**	**147,453**
ECM 1	Install LED Fixtures	Yes	941	0.2	0.0	$166.80	$781.35	$200.00	$581.35	3.49	948
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	111,058	42.9	0.0	$19,683.62	$82,644.92	$615.00	$82,029.92	4.17	111,834
ECM 3	Retrofit Fixtures with LED Lamps	Yes	18,989	8.8	0.0	$3,365.53	$18,033.01	$2,100.00	$15,933.01	4.73	19,122
ECM 4	Install LED Exit Signs	Yes	15,442	1.3	0.0	$2,736.93	$4,302.20	$0.00	$4,302.20	1.57	15,550

ECM 1: Install LED Fixtures

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	0.00	0
Exterior	941	0.2	0.0	$166.80	$781.35	$200.00	$581.35	3.49	948

Measure Description

We recommend replacing existing fixtures containing linear fluorescent (T8, T12, and U-bent), CFL, and incandescent lamps with new high-performance LED light fixtures. This measure saves energy by installing LED sources, which use less power than other technologies with a comparable light output.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes that are more than twice that of a fluorescent tube and more than ten (10) times longer than many incandescent lamps.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

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	111,058	42.9	0.0	$19,683.62	$82,644.92	$615.00	$82,029.92	4.17	111,834
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	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 with 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 that are more than twice that of fluorescent tubes and more than ten (10) times longer than many incandescent lamps.

ECM 3: Retrofit Fixtures with LED Lamps

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	18,456	8.7	0.0	$3,271.05	$16,271.66	$1,920.00	$14,351.66	4.39	18,585
Exterior	533	0.1	0.0	$94.48	$1,761.35	$180.00	$1,581.35	16.74	537

Measure Description

We recommend replacing incandescent screw-in or plug-in based lamps with LED lamps. This measure saves energy by installing LED sources which use less power than other technologies with a comparable light output.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes that are more than twice that of fluorescent tubes and more than ten (10) times longer than many incandescent lamps.

ECM 4: Install LED Exit Signs

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	15,442	1.3	0.0	$2,736.93	$4,302.20	$0.00	$4,302.20	1.57	15,550
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.00	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

Lighting control measures include several sub-measures as outlined in Figure 18 below.

Figure 18 – 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		**17,071**	**6.3**	**0.0**	**$3,025.72**	**$7,130.00**	**$1,415.00**	**$5,715.00**	**1.89**	**17,191**
ECM 5	Install Occupancy Sensor Lighting Controls	16,657	6.2	0.0	$2,952.23	$6,380.00	$1,100.00	$5,280.00	1.79	16,773
ECM 6	Install Daylight Dimming Controls	415	0.1	0.0	$73.48	$750.00	$315.00	$435.00	5.92	418

ECM 5: Install Occupancy Sensor Lighting Controls

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)
16,657	6.2	0.0	$2,952.23	$6,380.00	$1,100.00	$5,280.00	1.79	16,773

Measure Description

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

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

ECM 6: Install Daylight Dimming Controls

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)
415	0.1	0.0	$73.48	$750.00	$315.00	$435.00	5.92	418

Measure Description

This measure evaluates installing ceiling-mounted, adjustable, indoor photo sensor controls that serve the day lit areas. Photo sensor control is recommended for fixtures that are located adjacent to window spaces with ample daylight. Light fixtures must be capable of continuous or at least four steps of dimming. This measure would reduce energy use by fixtures in spaces when appropriate light levels are met via daylight.

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

4.1.3 Domestic Water Heating Upgrade

Domestic water heating measures include several sub-measures as outlined 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		**0**	**0.0**	**74.2**	**$633.16**	**$257.47**	**$0.00**	**$257.47**	**0.41**	**8,685**
ECM 7	Install Low-Flow Domestic Hot Water Devices	0	0.0	74.2	$633.16	$257.47	$0.00	$257.47	0.41	8,685

ECM 7: Install Low-Flow DHW Devices

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	74.2	$633.16	$257.47	$0.00	$257.47	0.41	8,685

Measure Description

This measure evaluates the savings from installing low-flow domestic water devices to reduce overall water flow in general and hot water flow in particular. Low-flow showerheads and faucet aerators reduce the water flow, relative to standard showerheads and aerators, from the fixture. Pre-rinse spray valves 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 valves will reduce water use.

All of the low flow devices reduce the overall water flow from the fixture which generally reduces the amount of hot water used resulting in energy and water savings.

5 ENERGY EFFICIENT PRACTICES

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

Close Doors and Windows

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

Use Window Treatments/Coverings

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

Perform Proper Lighting Maintenance

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

Develop a Lighting Maintenance Schedule

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

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.

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.

Perform Proper Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance are essential to retain proper functionality and efficiency of the heating system. Fuel burning equipment should undergo yearly tune-ups to ensure they are operating as safely and efficiently as possible from a combustion standpoint. A tune-up should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. The buildup of dirt, dust, or deposits on the internal surfaces of a boiler can greatly affect its heat transfer efficiency. These deposits can accumulate on the water side or fire side of the boiler. Boilers should be cleaned regularly according to the manufacturer's instructions to remove this build up in order to sustain efficiency and equipment life.

Plug Load Controls

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

Water Conservation

Installing low flow faucets or faucet aerators, low flow showerheads, and kitchen sink pre-rinse spray valves saves both energy and water. These devices save energy by reducing the overall amount of hot water used hence reducing the energy used to heat the water. The flow ratings for EPA WaterSense™ (http://www3.epa.gov/watersense/products) labeled devices are 1.5 gpm for bathroom faucets, 2.0 gpm for showerheads, and 1.28 gpm for pre-rinse spray valves.

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

Refer to Section 4.1.3 for any low-flow ECM recommendations.

6 SELF-GENERATION MEASURES

Self-generation measures include both renewable (e.g., solar, wind) and non-renewable (e.g., microturbines) 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 the use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines a goal of 70% of the State's electrical needs to be met by renewable sources by 2050.

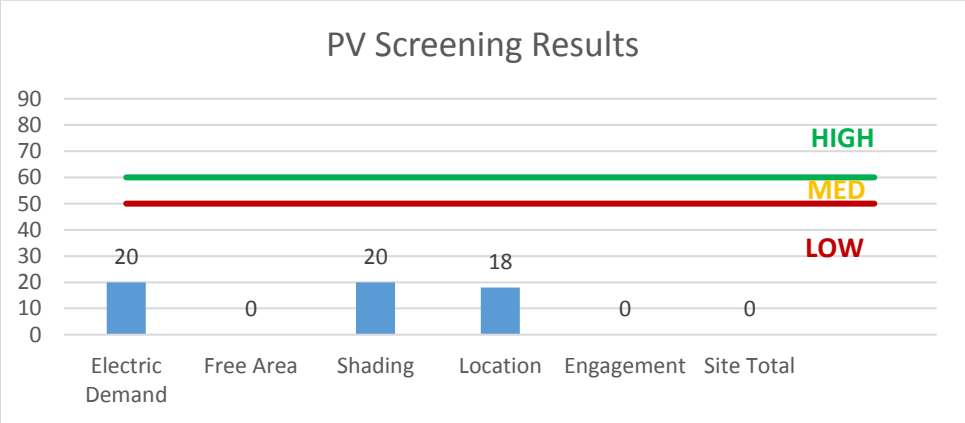
Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at existing energy profiles, siting, interconnection,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

6.1 Photovoltaic

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

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

Figure 20 - Photovoltaic Screening

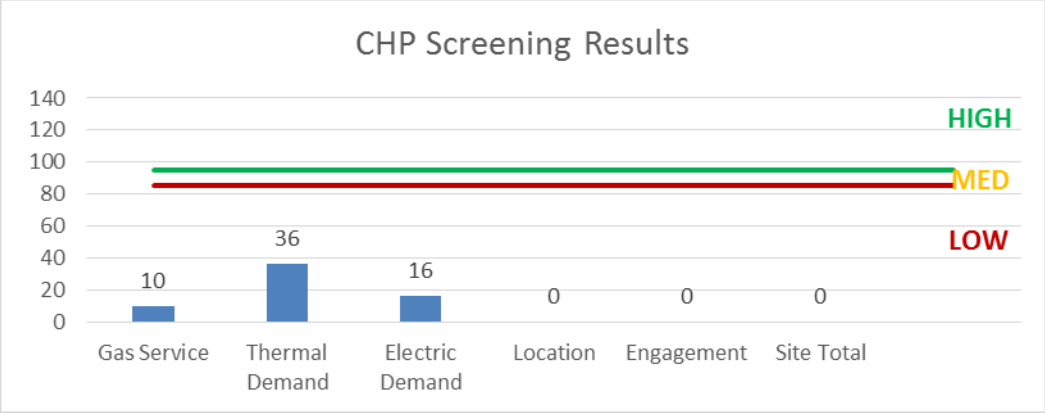


6.2 Combined Heat and Power

Combined heat and power (CHP) is the on-site generation of electricity and recovery of heat which is put to beneficial use. Common prime movers in CHP applications include reciprocating engines, microturbines, fuel cells, and (at large facilities) gas turbines. Electricity is typically interconnected to the sites local distribution system. Heat is recovered from the exhaust stream and the ancillary cooling system and interconnected to the existing hot water (or steam) distribution system.
CHP systems are typically used to produce a portion of the electricity needed by a facility, with the balance of electric needs satisfied by purchase from the grid. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for the purpose of space cooling. The key criteria used for screening, however, is the amount of time the system operates at full load and the facility's ability to use the recovered heat. Facilities with continuous use for large quantities of waste heat are the best candidates for CHP.

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

Figure 21 – CHP Screening



7 DEMAND RESPONSE

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

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

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

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

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

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

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and others, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay this charge on their monthly energy bills. As a contributor to the fund you were able to participate in the LGEA program and are also eligible to utilize the equipment incentive programs. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 22 for a list of the eligible programs identified for each recommended ECM.

Figure 22 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	Pay For Performance Existing Buildings
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 Low-Flow Domestic Hot Water Devices		x
ECM 8	Vending Machine Control		x

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

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

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

8.1 SmartStart

Overview

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

Prescriptive Equipment Incentives Available:

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

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

Incentives

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

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

How to Participate

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

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

8.2 Pay for Performance - Existing Buildings

Overview

The Pay for Performance – Existing Buildings (P4P EB) program is designed for larger customers with a peak demand over 200 kW in the preceding 12 months. Under this program, the minimum installed scope of work must include at least two (2) unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings. P4P is a generally a good option for medium to large sized facilities looking to implement as many measures as possible under a single project in order to achieve deep energy savings. This program has an added benefit of evaluating a broad spectrum of measures that may not otherwise qualify under other programs. Many facilities pursuing ESIP also utilize the P4P program.

Incentives

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

How to Participate

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

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

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

8.3 Energy Savings Improvement Program

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

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

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

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

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

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

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

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Basement	27	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	1,300	Fixture Replacement	Yes	27	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	910	2.97	5,370	0.0	$951.83	$3,849.02	$20.00	4.02
Basement	2	U-Bend Fluorescent - T12: U T12 (34W) - 1L	Wall Switch	43	1,300	Fixture Replacement	No	2	LED - Linear Tubes: (1) U-Lamp	Wall Switch	17	1,300	0.04	78	0.0	$13.80	$155.06	$0.00	11.24
Basement	10	CFL Screw-In Lamps: Ceiling Fixture	Wall Switch	26	1,300	Relamp	No	10	LED Screw-In Lamps: Ceiling fixture	Wall Switch	9	1,300	0.14	250	0.0	$44.26	$537.53	$0.00	12.14
Basement	14	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,300	Fixture Replacement	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	910	0.77	1,392	0.0	$246.77	$1,284.02	$20.00	5.12
Basement	18	Linear Fluorescent - T12: 4' T12 (40W) - 3L	Wall Switch	127	1,300	Fixture Replacement	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	910	1.41	2,553	0.0	$452.48	$1,994.30	$20.00	4.36
Basement	14	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,300	Fixture Replacement	Yes	14	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	910	1.23	2,213	0.0	$392.21	$2,666.94	$20.00	6.75
Basement	8	Exit Signs: Incandescent	None	45	8,760	Fixture Replacement	No	8	LED Exit Signs: 2 W Lamp	None	6	8,760	0.25	3,088	0.0	$547.39	$860.44	$0.00	1.57
Basement	1	Incandescent: Ceiling Fixture	Wall Switch	60	1,300	Relamp	No	1	LED Screw-In Lamps: Ceiling fixture	Wall Switch	9	1,300	0.04	75	0.0	$13.28	$53.75	$10.00	3.30
Basement	1	Linear Fluorescent - T12: 2' T12 (20W) - 1L	Wall Switch	25	1,300	Fixture Replacement	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	1,300	0.01	24	0.0	$4.30	$60.03	$0.00	13.97
Basement Room B10	16	Halogen Incandescent: Recessed fixture	Wall Switch	65	1,300	Relamp	No	16	LED Screw-In Lamps: Recessed fixture	Wall Switch	9	1,300	0.73	1,316	0.0	$233.28	$860.05	$160.00	3.00
Basement Room B10	21	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	1,300	Relamp	No	21	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,300	0.67	1,203	0.0	$213.24	$1,327.20	$0.00	6.22
Basement Room B11	10	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	1,300	Relamp	No	10	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,300	0.32	573	0.0	$101.54	$632.00	$0.00	6.22
Storage Room	2	U-Bend Fluorescent - T12: U T12 (34W) - 1L	Wall Switch	43	1,300	Relamp	No	2	LED - Linear Tubes: (1) U-Lamp	Wall Switch	17	1,300	0.04	78	0.0	$13.80	$79.46	$0.00	5.76
Storage Room	12	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,300	Fixture Replacement	No	12	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	1,300	0.84	1,516	0.0	$268.69	$2,186.52	$0.00	8.14
Hallway	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,080	Fixture Replacement	No	2	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,080	0.14	404	0.0	$71.65	$364.42	$0.00	5.09
Old Mail Room	10	Linear Fluorescent - T12: 4' T12 (40W) - 3L	Wall Switch	127	208	Fixture Replacement	No	10	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	208	0.68	196	0.0	$34.78	$1,043.50	$0.00	30.00
Old Mail Room	10	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	208	Fixture Replacement	No	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	208	0.96	277	0.0	$49.16	$1,382.60	$0.00	28.13
Old Mail Room	1	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	208	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	208	0.03	9	0.0	$1.62	$63.20	$0.00	38.90
Elevator Room	2	CFL Screw-In Lamps: Ceiling Fixture	Wall Switch	60	156	Relamp	No	2	LED Screw-In Lamps: Ceiling fixture	Wall Switch	9	156	0.08	18	0.0	$3.19	$107.51	$20.00	27.46
Rooms	20	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	156	Relamp	No	20	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	156	0.63	137	0.0	$24.37	$1,264.00	$0.00	51.87
Boiler Room	17	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,080	Fixture Replacement	No	17	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,080	1.63	4,715	0.0	$835.66	$2,350.42	$0.00	2.81
Boiler Room	2	CFL Screw-In Lamps: Ceiling Fixture	Wall Switch	26	2,080	Relamp	No	2	LED Screw-In Lamps: Ceiling fixture	Wall Switch	9	2,080	0.03	80	0.0	$14.16	$107.51	$20.00	6.18
Boiler Room	1	Exit Signs: Incandescent	None	45	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.03	386	0.0	$68.42	$107.56	$0.00	1.57
First floor - hallway	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	6	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.42	1,364	0.0	$241.82	$829.56	$0.00	3.43
First floor - hallway	12	Incandescent: Focus lamps	Wall Switch	35	2,340	Relamp	No	12	LED Screw-In Lamps: Focus lamps	Wall Switch	9	2,340	0.25	825	0.0	$146.22	$586.24	$120.00	3.19

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Office of city clerk	11	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	1,040	Relamp	Yes	11	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	728	0.44	632	0.0	$112.04	$811.20	$20.00	7.06
Office of city clerk	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,040	Fixture Replacement	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,040	0.14	208	0.0	$36.87	$250.29	$0.00	6.79
Office of city clerk	19	Linear Fluorescent - T12: 4' T12 (40W) - 3L	Wall Switch	127	1,040	Fixture Replacement	Yes	19	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	728	1.49	2,156	0.0	$382.10	$2,098.65	$20.00	5.44
Office of city clerk	1	CFL Screw-In Lamps: Recessed fixture	Wall Switch	26	1,040	Relamp	No	1	LED Screw-In Lamps: Recessed fixture	Wall Switch	9	1,040	0.01	20	0.0	$3.54	$53.75	$10.00	12.36
Office of city clerk	15	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,040	Fixture Replacement	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	728	0.83	1,193	0.0	$211.52	$1,367.45	$20.00	6.37
Office of city clerk	5	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	1,040	Relamp	No	5	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,040	0.16	229	0.0	$40.62	$316.00	$0.00	7.78
Office of city clerk	2	Incandescent: Wall mount fixture	Wall Switch	60	1,040	Relamp	No	2	LED Screw-In Lamps: Wall mount fixture	Wall Switch	9	1,040	0.08	120	0.0	$21.25	$107.51	$20.00	4.12
Office of city clerk	4	Linear Fluorescent - T12: 4' T12 (40W) - 6L	Wall Switch	254	1,040	Fixture Replacement	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,040	0.64	921	0.0	$163.30	$553.04	$0.00	3.39
Hallway	5	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	5	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.35	1,137	0.0	$201.52	$911.05	$0.00	4.52
Hallway	1	CFL Screw-In Lamps: Wall mount fixture	Wall Switch	26	2,340	Relamp	No	1	LED Screw-In Lamps: Wall mount fixture	Wall Switch	9	2,340	0.01	45	0.0	$7.97	$53.75	$10.00	5.49
City Assessor Room	8	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	1,040	Relamp	Yes	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	728	0.32	460	0.0	$81.48	$621.60	$20.00	7.38
City Assessor Room	2	CFL Screw-In Lamps: Recessed fixture	Wall Switch	26	1,040	Relamp	No	2	LED Screw-In Lamps: Recessed fixture	Wall Switch	9	1,040	0.03	40	0.0	$7.08	$107.51	$20.00	12.36
City Assessor Room	12	Linear Fluorescent - T12: 4' T12 (40W) - 3L	Wall Switch	127	1,040	Fixture Replacement	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	728	0.94	1,362	0.0	$241.32	$1,368.20	$20.00	5.59
City Assessor Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,040	Fixture Replacement	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,040	0.10	139	0.0	$24.58	$166.86	$0.00	6.79
City Assessor Room	6	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	1,040	Relamp	No	6	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,040	0.19	275	0.0	$48.74	$379.20	$0.00	7.78
Room 116A	12	Linear Fluorescent - T12: 4' T12 (40W) - 3L	Wall Switch	127	1,040	Fixture Replacement	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	728	0.94	1,362	0.0	$241.32	$1,368.20	$20.00	5.59
Room 116A	5	U-Bend Fluorescent - T12: U T12 (34W) - 1L	Wall Switch	43	1,040	Relamp	No	5	LED - Linear Tubes: (1) U-Lamp	Wall Switch	17	1,040	0.11	156	0.0	$27.60	$198.66	$0.00	7.20
Room 113	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,040	Fixture Replacement	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	728	0.18	253	0.0	$44.82	$480.42	$20.00	10.27
Hallway	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	2	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.14	455	0.0	$80.61	$364.42	$0.00	4.52
Room 112	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,040	Fixture Replacement	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	728	0.18	253	0.0	$44.82	$480.42	$20.00	10.27
Room 111	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,040	Fixture Replacement	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	728	0.18	253	0.0	$44.82	$480.42	$20.00	10.27
Room 110	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,040	Fixture Replacement	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	728	0.18	253	0.0	$44.82	$480.42	$20.00	10.27
Room 108	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	1,040	Fixture Replacement	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	728	0.33	477	0.0	$84.61	$530.78	$20.00	6.04
Room 108	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,040	Fixture Replacement	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	728	0.18	253	0.0	$44.82	$480.42	$20.00	10.27
Server Room	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,040	Fixture Replacement	No	2	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	1,040	0.14	202	0.0	$35.83	$364.42	$0.00	10.17

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 108	3	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	3	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	0.26	854	0.0	$151.28	$662.63	$20.00	4.25
Room 106	16	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	16	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	1.40	4,552	0.0	$806.83	$3,031.36	$20.00	3.73
Room 106	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,340	0.38	1,248	0.0	$221.20	$553.04	$0.00	2.50
Room 107	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.55	1,790	0.0	$317.28	$807.30	$20.00	2.48
Room 107	1	CFL Screw-In Lamps: Recessed fixture	Wall Switch	26	2,340	Relamp	No	1	LED Screw-In Lamps: Recessed fixture	Wall Switch	9	2,340	0.01	45	0.0	$7.97	$53.75	$10.00	5.49
Women's Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	728	Fixture Replacement	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	510	0.22	223	0.0	$39.48	$392.52	$20.00	9.43
Room 103	20	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,340	Relamp	Yes	20	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	1.19	3,882	0.0	$687.98	$2,018.67	$420.00	2.32
Room 103	8	CFL Screw-In Lamps: Recessed fixture	Wall Switch	26	2,340	Relamp	No	8	LED Screw-In Lamps: Recessed fixture	Wall Switch	9	2,340	0.11	360	0.0	$63.74	$430.02	$80.00	5.49
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,040	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,040	0.14	197	0.0	$34.99	$285.40	$60.00	6.44
Room 101	40	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	40	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	4.41	14,321	0.0	$2,538.22	$5,646.40	$20.00	2.22
Room 101	2	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	2,340	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,340	0.06	206	0.0	$36.55	$126.40	$0.00	3.46
Second Floor	5	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	5	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.35	1,137	0.0	$201.52	$911.05	$0.00	4.52
Second Floor - Memorial Council Chambers	4	Halogen Incandescent: Chandeliers	Wall Switch	320	1,040	Relamp	No	4	LED Screw-In Lamps: Chandelier	Wall Switch	11	1,040	1.01	1,453	0.0	$257.45	$2,150.12	$400.00	6.80
Second Floor - Memorial Council Chambers	32	LED Screw-In Lamps: Recessed fixture	Wall Switch	14	1,040	None	No	32	LED Screw-In Lamps: Recessed fixture	Wall Switch	14	1,040	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Second Floor - Memorial Council Chambers	16	LED Screw-In Lamps: Spot Fixtures	Wall Switch	14	1,040	None	No	16	LED Screw-In Lamps: Spot Fixtures	Wall Switch	14	1,040	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Second Floor - Memorial Council Chambers	10	LED Screw-In Lamps: Wall mount fixture	Wall Switch	11	1,040	None	No	10	LED Screw-In Lamps: Wall mount fixture	Wall Switch	11	1,040	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mayor's Office	4	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	0.35	1,138	0.0	$201.71	$844.84	$20.00	4.09
Mayor's Office	2	Incandescent: Wall mount fixture	Wall Switch	60	2,340	Relamp	No	2	LED Screw-In Lamps: Wall mount fixture	Wall Switch	11	2,340	0.08	259	0.0	$45.93	$107.51	$20.00	1.91
Mayor's Office - Storage Room	2	CFL Screw-In Lamps: Wall mount fixture	Wall Switch	26	52	Relamp	No	2	LED Screw-In Lamps: Wall mount fixture	Wall Switch	9	52	0.03	2	0.0	$0.35	$107.51	$20.00	247.13
Mayor's Office - Storage Room	2	Incandescent: Wall mount fixture	Wall Switch	60	2,340	Relamp	No	2	LED Screw-In Lamps: Wall mount fixture	Wall Switch	11	2,340	0.08	259	0.0	$45.93	$87.91	$20.00	1.48
Mayor's Office - Conference room	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	1,040	Fixture Replacement	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	728	0.44	636	0.0	$112.81	$669.04	$20.00	5.75
Mayor's Office - Conference room	3	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,040	Fixture Replacement	No	3	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	1,040	0.21	303	0.0	$53.74	$546.63	$0.00	10.17
Mayor's office	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	1,560	Fixture Replacement	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,092	0.53	1,138	0.0	$201.71	$1,209.26	$20.00	5.90
Mayor's office	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	1,040	Fixture Replacement	No	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,040	0.58	832	0.0	$147.47	$829.56	$0.00	5.63
Deputy Mayor's office	1	CFL Screw-In Lamps: Wall mount fixture	Wall Switch	54	2,340	Relamp	No	1	LED Screw-In Lamps: Wall mount fixture	Wall Switch	11	2,340	0.03	114	0.0	$20.15	$53.75	$10.00	2.17

	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
Deputy Mayor's office	7	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.77	2,506	0.0	$444.19	$1,083.82	$20.00	2.39
Deputy Mayor's office	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	6	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.42	1,364	0.0	$241.82	$1,093.26	$0.00	4.52
Hallway	4	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	4	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.28	910	0.0	$161.22	$728.84	$0.00	4.52
Bathroom - Men	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.22	716	0.0	$126.91	$392.52	$20.00	2.94
Bathroom - Women	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.33	1,074	0.0	$190.37	$530.78	$20.00	2.68
Office of Diversity & Inclusion Room 215	4	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	0.35	1,138	0.0	$201.71	$844.84	$20.00	4.09
Hallway	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	2	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.14	455	0.0	$80.61	$364.42	$0.00	4.52
Stairs	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,340	Fixture Replacement	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,340	0.03	83	0.0	$14.76	$62.52	$0.00	4.24
Office 215A	4	Halogen Incandescent: Recessed fixture	Wall Switch	40	2,340	None	No	4	Halogen Incandescent: Recessed fixture	Wall Switch	40	2,340	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office 215A	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,340	Fixture Replacement	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,340	0.06	185	0.0	$32.81	$249.68	$20.00	7.00
Room 213	23	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,340	Fixture Replacement	Yes	23	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,638	0.78	2,536	0.0	$449.48	$2,034.89	$250.00	3.97
Room 211	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,340	Fixture Replacement	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,638	0.87	2,812	0.0	$498.34	$1,889.95	$275.00	3.24
Room 211	2	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	2,340	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,340	0.06	206	0.0	$36.55	$126.40	$0.00	3.46
Hallway	5	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	5	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.35	1,137	0.0	$201.52	$911.05	$0.00	4.52
Room 207	4	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	0.35	1,138	0.0	$201.71	$844.84	$20.00	4.09
Room 206	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	2	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.14	455	0.0	$80.61	$364.42	$0.00	4.52
City Council Office	46	Linear Fluorescent - T8: 4' T12 (40W) - 2L	Wall Switch	44	2,340	Fixture Replacement	Yes	46	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,638	0.89	2,883	0.0	$510.92	$3,953.78	$20.00	7.70
Council President Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,340	Fixture Replacement	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,638	0.10	331	0.0	$58.63	$324.70	$50.00	4.69
Third Floor - Office 301	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,638	0.14	441	0.0	$78.17	$449.72	$60.00	4.99
Third Floor - Office 301	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,340	Fixture Replacement	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,340	0.09	296	0.0	$52.49	$276.52	$40.00	4.51
Third Floor - Hallway	12	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	12	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	1.05	3,414	0.0	$605.12	$2,302.52	$20.00	3.77
Third Floor - 302	18	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	18	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	1.98	6,444	0.0	$1,142.20	$2,604.68	$20.00	2.26
Room 302	3	Incandescent: Wall mount fixture	Wall Switch	120	2,340	Relamp	No	3	LED Screw-In Lamps: Wall mount fixture	Wall Switch	14	2,340	0.26	841	0.0	$149.03	$161.26	$30.00	0.88
Room 302	1	CFL Screw-In Lamps: Chandeliers	Wall Switch	243	2,340	Relamp	No	1	LED Screw-In Lamps: Chandelier	Wall Switch	11	2,340	0.19	613	0.0	$108.73	$483.78	$90.00	3.62
Room 302	4	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	0.35	1,138	0.0	$201.71	$844.84	$20.00	4.09

	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 304	8	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,340	Fixture Replacement	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,638	0.44	1,432	0.0	$253.82	$783.44	$20.00	3.01
Room 306	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.44	1,432	0.0	$253.82	$669.04	$20.00	2.56
Room 307	6	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,340	Fixture Replacement	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,638	0.33	1,074	0.0	$190.37	$616.58	$20.00	3.13
Hallway	8	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	8	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.56	1,819	0.0	$322.43	$1,457.68	$0.00	4.52
Men's Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	728	Fixture Replacement	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	510	0.22	223	0.0	$39.48	$392.52	$20.00	9.43
Room 309	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.55	1,790	0.0	$317.28	$807.30	$20.00	2.48
Hallway	3	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	3	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.21	682	0.0	$120.91	$546.63	$0.00	4.52
Room 310	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.22	716	0.0	$126.91	$392.52	$20.00	2.94
Room 311	11	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	1.21	3,938	0.0	$698.01	$1,636.86	$20.00	2.32
Room 312	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	0.53	1,707	0.0	$302.56	$1,209.26	$20.00	3.93
Room 313	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.33	1,074	0.0	$190.37	$530.78	$20.00	2.68
Hallway	3	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	3	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.21	682	0.0	$120.91	$546.63	$0.00	4.52
Room 314	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.41	1,325	0.0	$234.79	$807.30	$20.00	3.35
Women's Room	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,340	Fixture Replacement	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,638	0.11	358	0.0	$63.46	$282.86	$20.00	4.14
Room 315	4	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,638	0.22	716	0.0	$126.91	$449.72	$20.00	3.39
Room 315	1	LED Screw-In Lamps: Wall mount fixture	Wall Switch	11	728	None	No	1	LED Screw-In Lamps: Wall mount fixture	Wall Switch	11	728	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 316	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.66	2,148	0.0	$380.73	$945.56	$20.00	2.43
Room 317	4	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	0.35	1,138	0.0	$201.71	$844.84	$20.00	4.09
Room 318	9	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	Yes	9	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,638	0.79	2,561	0.0	$453.84	$1,755.89	$20.00	3.82
Room 318	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,340	0.38	1,248	0.0	$221.20	$553.04	$0.00	2.50
Room 320	1	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	1	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.07	227	0.0	$40.30	$182.21	$0.00	4.52
Room 320	11	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	1.21	3,938	0.0	$698.01	$1,636.86	$20.00	2.32
Bathroom	1	Incandescent: Wall mount fixture	Wall Switch	75	728	None	No	1	Incandescent: Wall mount fixture	Wall Switch	75	728	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 321	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	2	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.14	455	0.0	$80.61	$364.42	$0.00	4.52
Room 321	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,638	0.44	1,432	0.0	$253.82	$669.04	$20.00	2.56

	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 322	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,340	Fixture Replacement	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,340	0.38	1,248	0.0	$221.20	$553.04	$0.00	2.50
Stairs	1	U-Bend Fluorescent - T12: U T12 (34W) - 2L	Wall Switch	72	2,340	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,340	0.03	103	0.0	$18.28	$63.20	$0.00	3.46
Attic office	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,340	Fixture Replacement	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.24	780	0.0	$138.25	$417.15	$0.00	3.02
Attic office	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	6	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.42	1,364	0.0	$241.82	$1,093.26	$0.00	4.52
Attic office	5	CFL Screw-In Lamps: Recessed fixture	Wall Switch	26	2,340	Relamp	No	5	LED Screw-In Lamps: Recessed fixture	Wall Switch	9	2,340	0.07	225	0.0	$39.84	$268.77	$50.00	5.49
Attic office	30	Incandescent: Suspended fixture	Wall Switch	60	2,340	Relamp	No	30	LED Screw-In Lamps: Suspended fixture	Wall Switch	11	2,340	1.20	3,887	0.0	$688.92	$1,612.59	$300.00	1.91
Attic office	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,340	Fixture Replacement	No	2	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,340	0.14	455	0.0	$80.61	$364.42	$0.00	4.52
Attic office	4	Halogen Incandescent: Spot Fixtures	Wall Switch	100	1,040	Relamp	No	4	LED Screw-In Lamps: Spot fixtures	Wall Switch	14	1,040	0.28	404	0.0	$71.65	$215.01	$40.00	2.44
Exterior lights	2	CFL Screw-In Lamps: Pole fixture	Wall Switch	115	2,912	Relamp	Yes	2	LED Screw-In Lamps: Pole Fixture	Daylight Dimming	70	1,456	0.13	526	0.0	$93.31	$1,228.53	$190.00	11.13
Exterior lights	3	CFL Screw-In Lamps: Pole fixture	Wall Switch	46	2,912	Relamp	Yes	3	LED Screw-In Lamps: Pole Fixture	Daylight Dimming	28	1,456	0.08	316	0.0	$55.99	$837.12	$195.00	11.47
Exterior lights	2	CFL Screw-In Lamps: Pole fixture	Wall Switch	23	2,912	Relamp	Yes	2	LED Screw-In Lamps: Pole Fixture	Daylight Dimming	14	1,456	0.03	105	0.0	$18.66	$445.71	$110.00	17.99
Exterior lights	2	High-Pressure Sodium: (1) 150W Lamp	Wall Switch	188	2,912	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	45	2,912	0.23	941	0.0	$166.80	$781.35	$200.00	3.49
First floor - hallway	11	Exit Signs: Incandescent	None	45	8,760	Fixture Replacement	No	11	LED Exit Signs: 2 W Lamp	None	6	8,760	0.35	4,247	0.0	$752.66	$1,183.11	$0.00	1.57
Second floor - hallway	12	Exit Signs: Incandescent	None	45	8,760	Fixture Replacement	No	12	LED Exit Signs: 2 W Lamp	None	6	8,760	0.38	4,633	0.0	$821.08	$1,290.66	$0.00	1.57
Third floor - hallway	8	Exit Signs: Incandescent	None	45	8,760	Fixture Replacement	No	8	LED Exit Signs: 2 W Lamp	None	6	8,760	0.25	3,088	0.0	$547.39	$860.44	$0.00	1.57

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
Basement - Elevator Room	Elevator	1	Other	50.0	81.0%	No	4,067	No	81.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Elevator Room	Elevator Room	1	Exhaust Fan	0.5	78.2%	No	2,745	No	78.2%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside	Server Room	1	Supply Fan	0.3	78.2%	No	2,745	No	78.2%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside	Human Resources	1	Supply Fan	2.0	86.5%	No	2,745	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boilers	2	Exhaust Fan	1.0	77.0%	Yes	2,745	No	77.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Outside	Offices	2	Split-System AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside	Human Resources	1	Split-System Air-Source HP	10.00	119.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside	Cooling health benefits room	1	Ductless Mini-Split HP	2.00	27.60	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
First floor office	Office of clerk	2	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
First floor office	Room 106	1	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Second floor	Offices	25	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Second floor	Offices	2	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Third Floor	Offices	30	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Rooftop	2	Packaged AC	19.80		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
First floor offices	Offices	6	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
First floor offices	Offices	1	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside	Finance	2	Packaged AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Outside	Office	1	Packaged AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
First floor office	First floor office	1	Split-System AC	1.50		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
Basement boiler room	City hall offices	2	Non-Condensing Hot Water Boiler	5,994.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Basement	Water Room and basement	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Offices	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	1	Faucet Aerator (Kitchen)	3.00	2.20	0.00	0	3.2	$27.73	$7.17	$0.00	0.26
Office of Clerk	2	Faucet Aerator (Kitchen)	3.00	2.20	0.00	0	6.5	$55.46	$14.34	$0.00	0.26
Mayor's office	1	Faucet Aerator (Lavatory)	3.00	1.00	0.00	0	8.1	$69.32	$7.17	$0.00	0.10
3rd floor Men's room	3	Faucet Aerator (Lavatory)	3.00	1.00	0.00	0	24.4	$207.97	$21.51	$0.00	0.10
3rd floor Women's Room	2	Faucet Aerator (Lavatory)	3.00	1.00	0.00	0	16.2	$138.65	$14.34	$0.00	0.10
Room 315	1	Showerhead	2.50	2.00	0.00	0	1.4	$11.55	$89.30	$0.00	7.73
Room 315	1	Faucet Aerator (Lavatory)	2.20	1.00	0.00	0	4.9	$41.59	$7.17	$0.00	0.17
Room 315	1	Showerhead	2.50	2.00	0.00	0	1.4	$11.55	$89.30	$0.00	7.73
Room 320	1	Faucet Aerator (Lavatory)	3.00	1.00	0.00	0	8.1	$69.32	$7.17	$0.00	0.10

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Basement	32	Computer	75.0	Yes
Basement	2	Refrigerator - Medium	50.0	No
Basement	1	Refrigerator - Big	600.0	No
Basement	3	Microwave	1,000.0	No
Basement	1	Coffee Machine	400.0	Yes
Basement	2	Pop up Toaster	850.0	No
Basement	2	Water Dispenser	12.5	Yes
Basement	3	Standing Fan	187.0	No
Basement	1	Table fan	60.0	No
Basement	1	Toaster oven	1,200.0	No
Basement	1	Television - CRT	120.0	No
First Floor	113	Computer	75.0	Yes
First Floor	21	Printer - Small	20.0	Yes
First Floor	11	Printer - Big	515.0	Yes
First Floor	1	Refrigerator - Small	26.0	No
First Floor	8	Refrigerator - Medium	200.0	No
Third Floor	1	Refrigerator - Small	26.0	No
Third Floor	3	Refrigerator - Medium	200.0	No
Third Floor	1	Refrigerator - Big	400.0	No
Third Floor	5	Microwave	1,000.0	No
Third Floor	1	Coffee Machine	400.0	No
Third Floor	1	Water Dispenser	12.5	Yes
Third Floor	1	Toaster oven	1,200.0	No
Third Floor	2	Paper Shredder	360.0	No
Third Floor	1	Space heater	1,500.0	No
Third Floor	1	Television	200.0	No
Third Floor	1	Ceiling Fan	60.0	No
Third Floor	2	Air Coolers	1,000.0	Yes