Local Government Energy Audit Report

Administrative Building

April 30, 2019

Prepared for:

County of Salem
94 Market Street
Salem, NJ 08079

Prepared by:

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Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

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

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual 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. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

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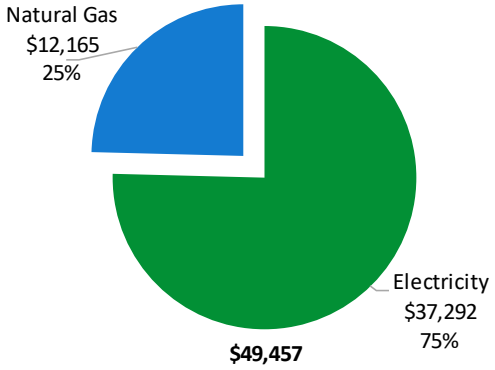
1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for the Administrative Building. This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in your facility. TRC Energy Services (TRC) conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $49,457 Electricity: 247,918 kWh Natural Gas: 10,625 Therms	
ENERGY STAR® Benchmarking Score	34 *(1-100 scale)*	*The ENERGY STAR® Portfolio Manager® website was closed due to the ongoing federal government shutdown when this report was produced. Therefore, an SEP report and ENERGY STAR® score could not be generated for this site. Benchmarking for this site will be completed when the Portfolio Manager® website is reopened.*

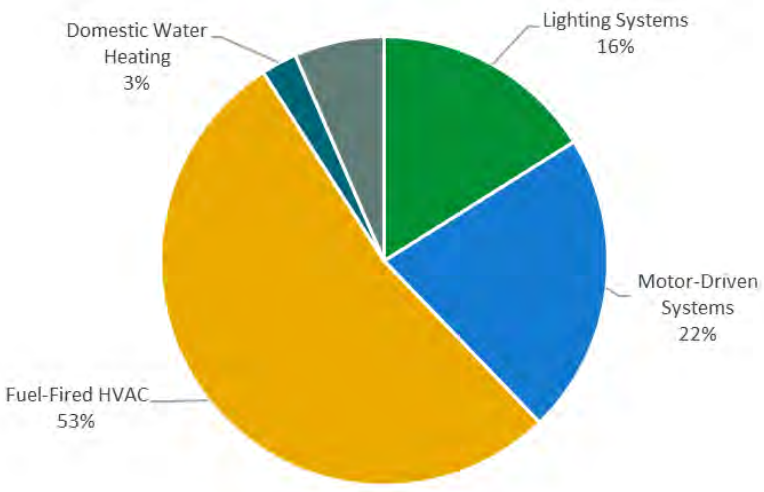


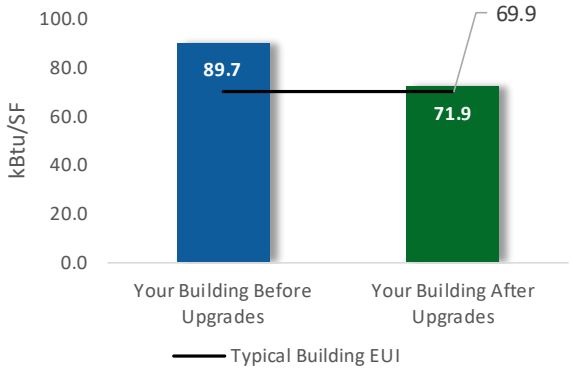
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

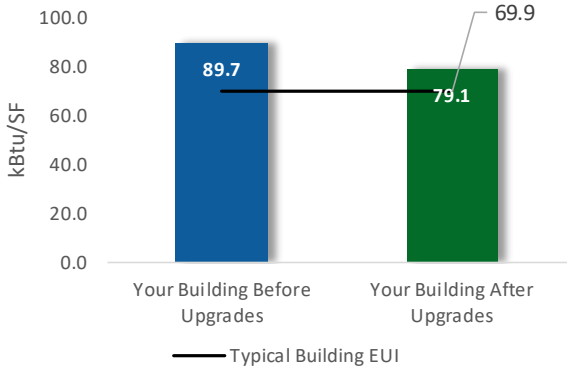
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$136,709
Potential Rebates & Incentives[1]	$15,138
Annual Cost Savings	$11,606
Annual Energy Savings	Electricity: 65,342 kWh Natural Gas: 1,552 Therms
Greenhouse Gas Emission Savings	42 Tons
Simple Payback	10.5 Years
Site Energy Savings (all utilities)	20%



Scenario 2: Cost Effective Package[2]

Installation Cost	$67,165
Potential Rebates & Incentives	$9,847
Annual Cost Savings	$9,698
Annual Energy Savings	Electricity: 64,052 kWh Natural Gas: 55 Therms
Greenhouse Gas Emission Savings	33 Tons
Simple Payback	5.9 Years
Site Energy Savings (all utilities)	12%



On-site Generation Potential

Photovoltaic	None
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other Program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Lifetime Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**52,096**	**20.4**	**-7**	**$7,759**	**$116,392**	**$57,162**	**$9,462**	**$47,700**	**6.1**	**51,674**
ECM 1	Install LED Fixtures	19,960	3.2	0	$3,002	$45,035	$33,996	$3,600	$30,396	10.1	20,099
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,059	0.9	0	$305	$4,572	$643	$100	$543	1.8	2,023
ECM 3	Retrofit Fixtures with LED Lamps	30,077	16.3	-6	$4,452	$66,784	$22,522	$5,762	$16,760	3.8	29,551
Lighting Control Measures		**2,342**	**1.0**	**0**	**$347**	**$2,773**	**$5,370**	**$385**	**$4,985**	**14.4**	**2,301**
ECM 4	Install Occupancy Sensor Lighting Controls	1,421	0.6	0	$210	$1,683	$2,970	$385	$2,585	12.3	1,396
	Install High/Low Lighting Controls	921	0.4	0	$136	$1,090	$2,400	$0	$2,400	17.6	905
Motor Upgrades		**370**	**0.1**	**0**	**$56**	**$835**	**$4,181**	**$0**	**$4,181**	**75.1**	**372**
	Premium Efficiency Motors	370	0.1	0	$56	$835	$4,181	$0	$4,181	75.1	372
Variable Frequency Drive (VFD) Measures		**8,580**	**1.9**	**0**	**$1,291**	**$19,359**	**$6,552**	**$0**	**$6,552**	**5.1**	**8,640**
ECM 5	Install VFDs on Chilled Water Pumps	8,580	1.9	0	$1,291	$19,359	$6,552	$0	$6,552	5.1	8,640
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**150**	**$1,716**	**$34,312**	**$62,962**	**$5,291**	**$57,672**	**33.6**	**17,544**
	Install High Efficiency Hot Water Boilers	0	0.0	150	$1,716	$34,312	$62,962	$5,291	$57,672	33.6	17,544
Domestic Water Heating Upgrade		**0**	**0.0**	**13**	**$144**	**$1,438**	**$22**	**$0**	**$22**	**0.1**	**1,471**
ECM 6	Install Low-Flow DHW Devices	0	0.0	13	$144	$1,438	$22	$0	$22	0.1	1,471
Food Service & Refrigeration Measures		**1,954**	**0.2**	**0**	**$294**	**$1,470**	**$460**	**$0**	**$460**	**1.6**	**1,968**
ECM 7	Vending Machine Control	1,954	0.2	0	$294	$1,470	$460	$0	$460	1.6	1,968
TOTALS		**65,342**	**23.5**	**155**	**$11,606**	**$176,578**	**$136,709**	**$15,138**	**$121,571**	**10.5**	**83,970**

* - All incentives presented in this table are based on NJ SmartStart 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).

Figure 2 – Evaluated Energy Improvements

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
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 Occupancy Sensor Lighting Controls	X	X	
ECM 5	Install VFDs on Chilled Water Pumps		X	
ECM 6	Install Low-Flow Domestic Hot Water Devices		X	
ECM 7	Vending Machine Control		X	

Figure 3 – Funding Options

New Jersey's Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce their electric demand 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 demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for the Administrative Building. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

2.1 Site Overview

On September 25, 2018, TRC performed an energy audit at the Administrative Building located in Salem, New Jersey. TRC met with Debby Turner to review the facility operations and help focus our investigation on specific energy-using systems.

The Administrative Building is a three-story, 21,285 square foot building built in 1958. Spaces include: offices, break rooms, holding cells, hallways, restrooms, weight room, document storage, an armory room, closets, and electrical and mechanical spaces.

2.2 Building Occupancy

The facility is occupied year-round. Typical weekday occupancy is 14 staff.

There are no weekend activities or occupancy.

Building Name	Weekday/Weekend	Operating Schedule
Administrative Building	Weekday	8:30AM - 4:30PM
	Weekend	Closed

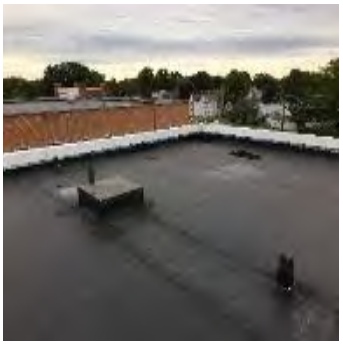
Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are brick masonry over wooden frame. A portion of the roof is flat and covered with black membrane, and it is in fair condition.

Most of the windows are single-pane glazed with storm windows and have wood frames. The glass-to-frame seals are in fair condition. The operable window weather seals are in fair condition, showing little evidence of excessive wear. Exterior doors have wood frames and are in fair condition with undamaged door seals. Degraded window and door seals increase drafts and outside air infiltration.

Building Exterior



Flat Roof

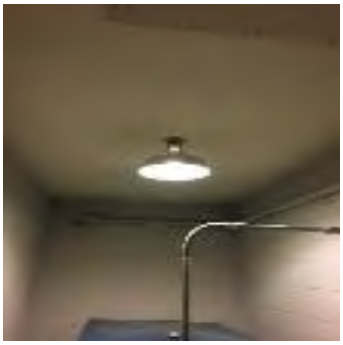
2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. There are also a few 40-Watt T12 fixtures. Additionally, there are some compact fluorescent lamps (CFL) and LED general purpose lamps. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use magnetic ballasts.

Fixture types include 2-lamp 3-lamp or 4-lamp, 2-foot or 4-foot long troffer or other recessed fixtures and 2-foot fixtures with linear tube lamps. All exit signs are LED units. Most fixtures are in good condition.

Interior lighting levels were generally sufficient.

Office Lighting



Elevator Room Lights

Storage Lights

Occupancy Sensors

Most lighting fixtures are controlled by occupancy sensors and the remainder by wall switches.

Exterior fixtures include wall packs with metal halide lamps. Pole mounted fixtures have high-pressure sodium lamps.

2.5 Air Handling Systems

Air Handlers and Energy Recovery Units

The building has air-handling units which provide primary heating, cooling and ventilation. There are also some fan coil units in rooms throughout the facility. Heat recovery units precondition outside air to the air-handlers.

Air Conditioners

The building uses three ductless mini-split air conditioning (AC) units for supplementary cooling. These vary in capacity between 1-ton and 2 tons. The units are in fair condition. They range in efficiency between 10.2 EER to 13.4 EER.

Ductless Mini-Split AC

Energy Recovery Units

2.6 Heating Hot Water Systems

Two Weil McLain 1,763.5 MBh hot water boilers serve the building heating load. The burners are non-modulating with a nominal efficiency of 72%. The boilers are configured in an automated control scheme. Both boilers may be required under high load conditions.

The boilers are configured in a constant flow primary distribution with two 3 hp constant speed hot water supply pumps and fractional horsepower constant speed return pumps. The boilers provide hot water to fan coil units and air-handlers throughout the building.

The supply and return pipe have insulation and are in fair condition.

Hot Water Boilers

Hot Water Pumps

2.7 Chilled Water Systems

Chilled water is supplied to the building from the chiller in the New Courthouse, and its electrical use is tied to the meter located there. Two 5 hp constant speed pumps are located in and metered from this building (Administrative) and distribute the chilled water to local air-handlers and fan coil units.

Chilled Water Pumps

2.8 Domestic Hot Water

Hot water is produced with a 50 gallon, 40 MBh gas-fired storage water heater with a 63% Energy Factor (EF).

The domestic hot water pipes are insulated, and the insulation is in good condition.

Domestic Hot Water Heater

2.9 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 6.5% of total building energy use. This is higher than a typical building.

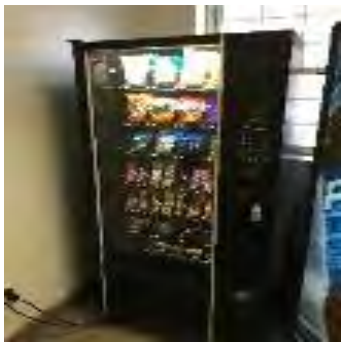
You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are 61 computer work stations throughout the facility. Plug loads throughout the building include office equipment, such as printers, copiers, projectors, and paper shredders as well as televisions, refrigerators, mini fridge, water coolers, microwaves, toaster ovens, and coffee makers.

There is a refrigerated vending machine and a non-refrigerated vending machine.

Televisions

Break Room Appliances



Vending Machines

Water Coolers

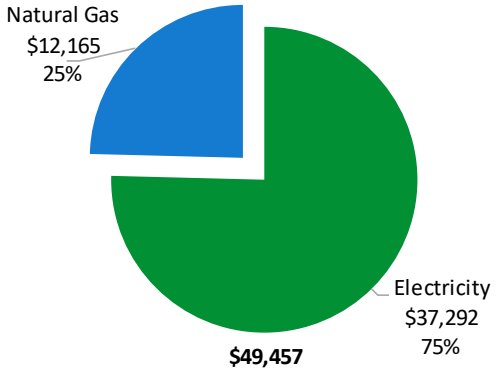
2.10 Water-Using Systems

There are three restrooms with toilets, urinals, and sinks. Faucet flow rates are at 3.0 gallons per minute (gpm) or higher.

3 Energy Use and Costs

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	247,918 kWh	$37,292
Natural Gas	10,625 Therms	$12,165
Total		**$49,457**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

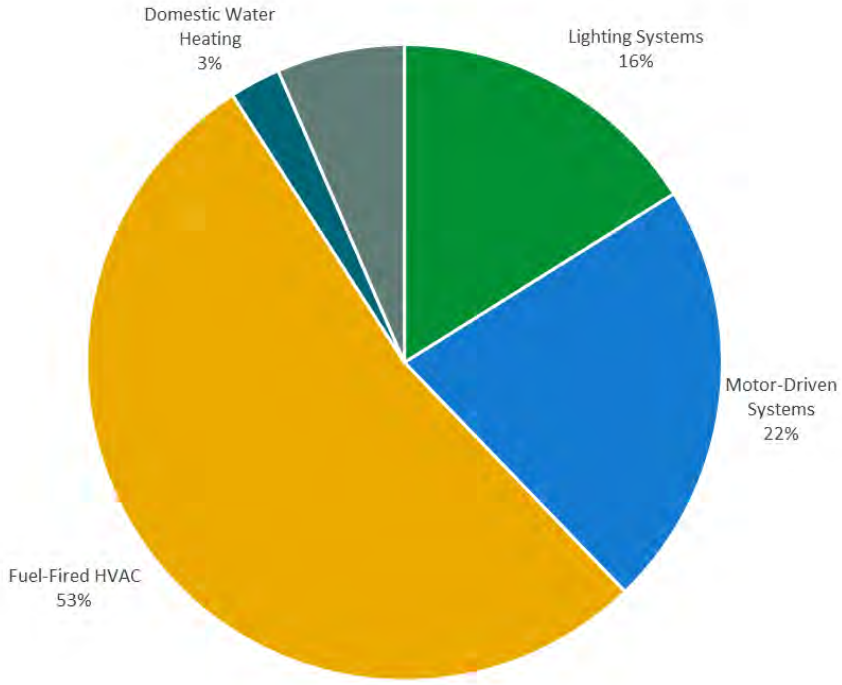
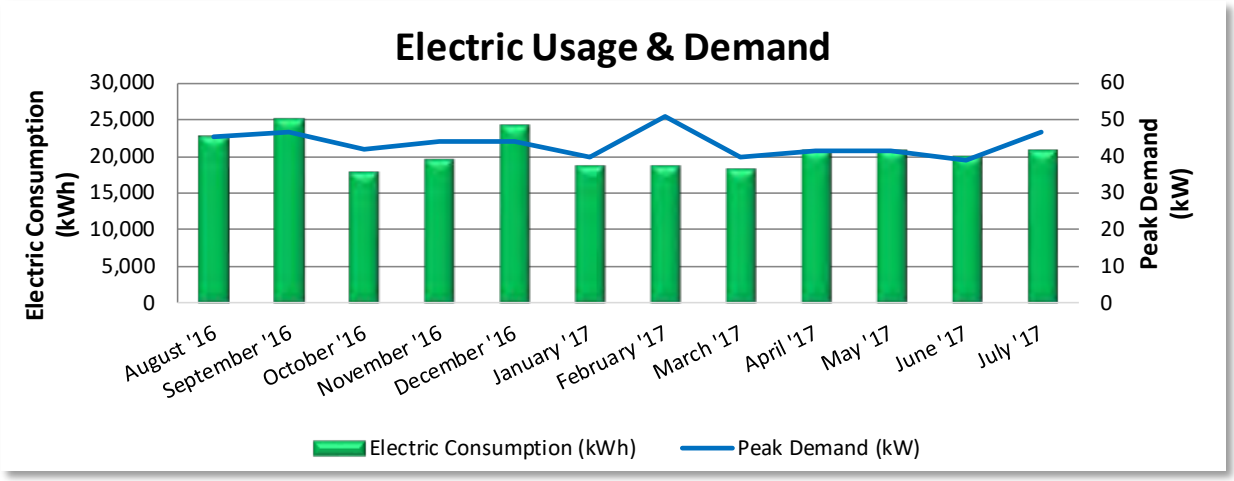


Figure 5 - Energy Balance

3.1 Electricity

Atlantic City Electric delivers electricity under rate class Street and Private Lighting, Monthly Secondary General Service, with electric production provided by Constellation New Energy, a third-party supplier.



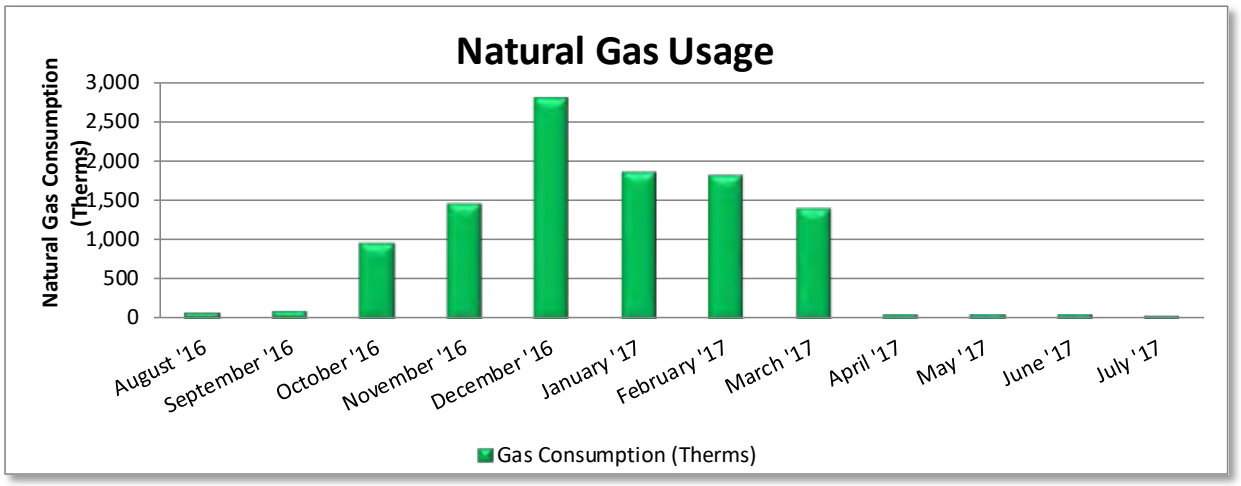
Electric Billing Data				
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Total Electric Cost**
8/31/16	31	22,774	45	$3,419
9/30/16	30	25,200	46	$3,738
10/31/16	31	17,823	42	$2,786
11/30/16	30	19,610	44	$3,056
12/31/16	31	24,274	44	$3,691
1/31/17	31	18,811	40	$2,897
2/28/17	28	18,624	51	$2,992
3/31/17	31	18,356	40	$2,882
4/30/17	30	20,841	42	$3,213
5/31/17	31	20,793	42	$3,148
6/30/17	30	20,047	39	$2,882
7/31/17	31	20,765	46	$2,587
Totals	**365**	**247,918**	**51**	**$37,292**
Annual	**365**	**247,918**	**51**	**$37,292**

Notes:

- Peak demand of 51 kW occurred in February 2017.
- The average electric cost over the past 12 months was $0.150/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.
- The electricity consumption and demand are relatively consistent month to month due to the minimal electric HVAC equipment in the building.
- Electrical use may be lower than expected for a building this size because the cooling energy is supplied by a chiller which is metered elsewhere

3.2 Natural Gas

South Jersey Gas delivers natural gas under rate class General Service FT, with natural gas supply provided by Constellation New Energy, a third-party supplier.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
9/15/16	30	71	$81
10/17/16	32	87	$100
11/12/16	26	944	$1,080
12/12/16	30	1,446	$1,656
1/17/17	36	2,787	$3,191
2/13/17	27	1,852	$2,121
3/14/17	29	1,803	$2,065
4/13/17	30	1,388	$1,589
5/15/17	32	55	$63
6/14/17	30	52	$59
7/15/17	31	43	$49
8/14/17	30	39	$45
Totals	**363**	**10,567**	**$12,098**
Annual	**365**	**10,625**	**$12,165**

Notes:

- The average gas cost for the past 12 months is $1.145/therm, which is the blended rate used throughout the analysis.
- Gas consumption occurs primarily in winter due to the heating provided by hot water boilers.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the county, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

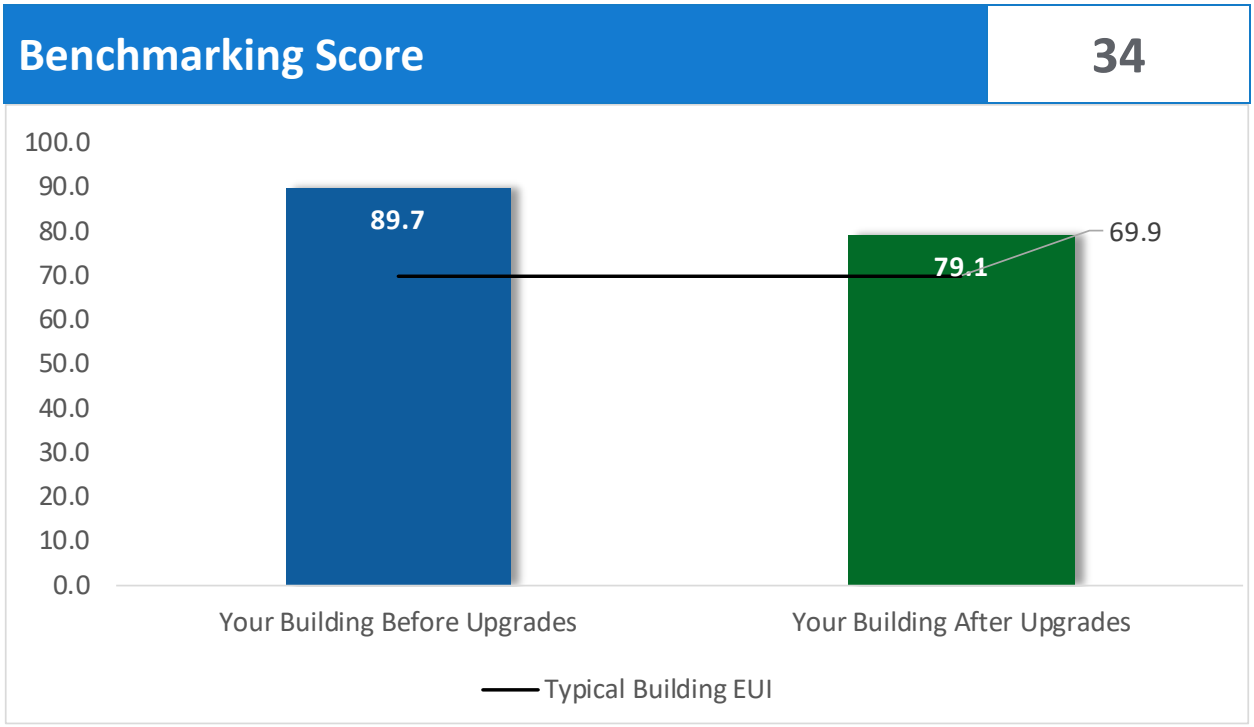


Figure 6 - Energy Use Intensity Comparison

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause a building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1

4 ENERGY CONSERVATION MEASURES

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

Appendix A: Equipment Inventory & Recommendations

This appendix provides a detailed list of the locations and recommended upgrades for each energy conservation measure.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**52,096**	**20.4**	**-7**	**$7,759**	**$57,162**	**$9,462**	**$47,700**	**6.1**	**51,674**
ECM 1	Install LED Fixtures	19,960	3.2	0	$3,002	$33,996	$3,600	$30,396	10.1	20,099
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,059	0.9	0	$305	$643	$100	$543	1.8	2,023
ECM 3	Retrofit Fixtures with LED Lamps	30,077	16.3	-6	$4,452	$22,522	$5,762	$16,760	3.8	29,551
Lighting Control Measures		**2,342**	**1.0**	**0**	**$347**	**$5,370**	**$385**	**$4,985**	**14.4**	**2,301**
ECM 4	Install Occupancy Sensor Lighting Controls	1,421	0.6	0	$210	$2,970	$385	$2,585	12.3	1,396
	Install High/Low Lighting Controls	921	0.4	0	$136	$2,400	$0	$2,400	17.6	905
Motor Upgrades		**370**	**0.1**	**0**	**$56**	**$4,181**	**$0**	**$4,181**	**75.1**	**372**
	Premium Efficiency Motors	370	0.1	0	$56	$4,181	$0	$4,181	75.1	372
Variable Frequency Drive (VFD) Measures		**8,580**	**1.9**	**0**	**$1,291**	**$6,552**	**$0**	**$6,552**	**5.1**	**8,640**
ECM 5	Install VFDs on Chilled Water Pumps	8,580	1.9	0	$1,291	$6,552	$0	$6,552	5.1	8,640
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**150**	**$1,716**	**$62,962**	**$5,291**	**$57,672**	**33.6**	**17,544**
	Install High Efficiency Hot Water Boilers	0	0.0	150	$1,716	$62,962	$5,291	$57,672	33.6	17,544
Domestic Water Heating Upgrade		**0**	**0.0**	**13**	**$144**	**$22**	**$0**	**$22**	**0.1**	**1,471**
ECM 6	Install Low-Flow DHW Devices	0	0.0	13	$144	$22	$0	$22	0.1	1,471
Food Service & Refrigeration Measures		**1,954**	**0.2**	**0**	**$294**	**$460**	**$0**	**$460**	**1.6**	**1,968**
ECM 7	Vending Machine Control	1,954	0.2	0	$294	$460	$0	$460	1.6	1,968
TOTALS		**65,342**	**23.5**	**155**	**$11,606**	**$136,709**	**$15,138**	**$121,571**	**10.5**	**83,970**

* - All incentives presented in this table are based on NJ SmartStart 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).

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**52,096**	**20.4**	**-7**	**$7,759**	**$57,162**	**$9,462**	**$47,700**	**6.1**	**51,674**
ECM 1	Install LED Fixtures	19,960	3.2	0	$3,002	$33,996	$3,600	$30,396	10.1	20,099
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,059	0.9	0	$305	$643	$100	$543	1.8	2,023
ECM 3	Retrofit Fixtures with LED Lamps	30,077	16.3	-6	$4,452	$22,522	$5,762	$16,760	3.8	29,551
Lighting Control Measures		**1,421**	**0.6**	**0**	**$210**	**$2,970**	**$385**	**$2,585**	**12.3**	**1,396**
ECM 4	Install Occupancy Sensor Lighting Controls	1,421	0.6	0	$210	$2,970	$385	$2,585	12.3	1,396
Variable Frequency Drive (VFD) Measures		**8,580**	**1.9**	**0**	**$1,291**	**$6,552**	**$0**	**$6,552**	**5.1**	**8,640**
ECM 5	Install VFDs on Chilled Water Pumps	8,580	1.9	0	$1,291	$6,552	$0	$6,552	5.1	8,640
Domestic Water Heating Upgrade		**0**	**0.0**	**13**	**$144**	**$22**	**$0**	**$22**	**0.1**	**1,471**
ECM 6	Install Low-Flow DHW Devices	0	0.0	13	$144	$22	$0	$22	0.1	1,471
Food Service & Refrigeration Measures		**1,954**	**0.2**	**0**	**$294**	**$460**	**$0**	**$460**	**1.6**	**1,968**
ECM 7	Vending Machine Control	1,954	0.2	0	$294	$460	$0	$460	1.6	1,968
TOTALS		**64,052**	**23.0**	**6**	**$9,698**	**$67,165**	**$9,847**	**$57,318**	**5.9**	**65,149**

* - All incentives presented in this table are based on NJ SmartStart 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).

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**52,096**	**20.4**	**-7**	**$7,759**	**$57,162**	**$9,462**	**$47,700**	**6.1**	**51,674**
ECM 1	Install LED Fixtures	19,960	3.2	0	$3,002	$33,996	$3,600	$30,396	10.1	20,099
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,059	0.9	0	$305	$643	$100	$543	1.8	2,023
ECM 3	Retrofit Fixtures with LED Lamps	30,077	16.3	-6	$4,452	$22,522	$5,762	$16,760	3.8	29,551

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources are proposed, we suggest converting all of a specific lighting type (e.g., linear fluorescent) to LED lamps to minimize the number of lamp types in use at the facility, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

Replace exterior fixtures containing metal halide and high-pressure sodium lamps with new LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

Maintenance savings may also be achieved since LED lamps last longer than other light sources and therefore do not need to be replaced as often.

Affected building areas: exterior fixtures

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Retrofit fluorescent fixtures by removing the fluorescent tubes and ballasts and replacing them with LED tubes and LED drivers (if necessary), which are designed to be used in retrofitted fluorescent fixtures.

The measure uses the existing fixture housing but replaces the electric components with more efficient lighting technology which use less power than other lighting technologies but provides equivalent lighting output. Maintenance savings may also be achieved since LED tubes last longer than fluorescent tubes and therefore do not need to be replaced as often.

Affected building areas: T12 HO fixtures in the Sally Port Space

ECM 3: Retrofit Fixtures with LED Lamps

Replace fluorescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as a direct replacement for most other lighting technologies.

This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes and CFLs

4.2 Lighting Controls

#	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		**2,342**	**1.0**	**0**	**$347**	**$5,370**	**$385**	**$4,985**	**14.4**	**2,301**
ECM 4	Install Occupancy Sensor Lighting Controls	1,421	0.6	0	$210	$2,970	$385	$2,585	12.3	1,396
	Install High/Low Lighting Controls	921	0.4	0	$136	$2,400	$0	$2,400	17.6	905

Lighting controls reduce energy use by turning off or lowering, lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 4: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected building areas: Sherriff's office, weight room, records room, temporary evidence, K9 offices, and fugitive unit

Install High/Low Lighting Controls

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low level after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

This measure can provide energy savings by reducing the light fixture power draw when reduced light output is appropriate.

This measure is not cost effective based on energy savings alone, because the simple payback period of the measure is near or exceeds the expected useful life of the replacement equipment.

4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**370**	**0.1**	**0**	**$56**	**$4,181**	**$0**	**$4,181**	**75.1**	**372**
	Premium Efficiency Motors	370	0.1	0	$56	$4,181	$0	$4,181	75.1	372

Install Premium Efficiency Motors

This evaluation assumes that existing motors will be replaced with motors of equivalent size and type. In some cases, additional savings may be possible by downsizing motors to better meet the motor's current load requirements.

Affected motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Basement	Chilled Water	2	Chilled Water Pump	5.0	
Roof	HRU-1, 2	2	Supply Fan	1.5	Semco Inc, FV-3000-H
Roof	HRU-1, 2	2	Exhaust Fan	2.0	Semco Inc, FV-3000-H

Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours. The base case motor energy consumption is estimated using the efficiencies found on nameplates or estimated based on the age of the motor and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the current *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*.

This measure is not cost effective based on energy savings alone, because the simple payback period of the measure exceeds the expected useful life of the replacement equipment. For motors where VFDs are indicated, inverter duty motors are typically a requirement. It may be necessary to replace those motors if existing motors are not properly rated.

4.4 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**8,580**	**1.9**	**0**	**$1,291**	**$6,552**	**$0**	**$6,552**	**5.1**	**8,640**
ECM 5	Install VFDs on Chilled Water Pumps	8,580	1.9	0	$1,291	$6,552	$0	$6,552	5.1	8,640

Variable frequency drives control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor — unless the existing motor

meets or exceeds IHP 2014 standards—to conservatively account for the cost of an inverter duty rated motor. The savings and cost associated with the new motor are presented with the Premium Efficiency Motor measures. If the proposed VFD measure is not selected for implementation the motor replacement should be reevaluated.

ECM 5: Install VFDs on Chilled Water Pumps

Install VFDs to control chilled water pumps. Two-way valves must serve the chilled water coils being served and the chilled water loop must have a differential pressure sensor installed. If three-way valves or a bypass leg are used in the chilled water distribution they will need to be modified when this measure is implemented. As the chilled water valves close, the differential pressure increases, and the VFD modulates the pump speed to maintain a differential pressure setpoint.

For systems with variable chilled water flow through the chiller, the minimum flow to prevent the chiller from tripping off will need to be determined during the final project design. The control system should be programmed to maintain the minimum flow through the chiller and to prevent pump cavitation.

Energy savings result from reducing the pump motor speed (and power) as chilled water valves close. The magnitude of energy savings is based on the estimated amount of time that the system operates at reduced loads.

4.5 Gas-Fired Heating

#	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)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**150**	**$1,716**	**$62,962**	**$5,291**	**$57,672**	**33.6**	**17,544**
	Install High Efficiency Hot Water Boilers	0	0.0	150	$1,716	$62,962	$5,291	$57,672	33.6	17,544

Install High Efficiency Hot Water Boilers

Replacing the boilers has a long payback and may not be justifiable based simply on energy considerations. However, the boilers have reached the end of their normal useful life. Typically, the marginal cost of purchasing high efficiency boilers can be justified by the marginal savings from the improved efficiency. When the boiler is eventually replaced, consider purchasing boilers that exceed the minimum efficiency required by building codes. We also recommend working with your mechanical design team to determine whether the heating system can operate with return water temperatures below 130°F, which would allow the use of condensing boilers.

4.6 Domestic Water Heating

#	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**	**13**	**$144**	**$22**	**$0**	**$22**	**0.1**	**1,471**
ECM 6	Install Low-Flow DHW Devices	0	0.0	13	$144	$22	$0	$22	0.1	1,471

ECM 6: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low flow devices are recommended to reduce hot water usage:

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing.

Additional cost savings may result from reduced water usage.

4.7 Food Service & Refrigeration Measures

#	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)
Food Service & Refrigeration Measures		**1,954**	**0.2**	**0**	**$294**	**$460**	**$0**	**$460**	**1.6**	**1,968**
ECM 7	Vending Machine Control	1,954	0.2	0	$294	$460	$0	$460	1.6	1,968

ECM 7: Vending Machine Control

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time, and, they power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

5 ENERGY EFFICIENT BEST PRACTICES

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[4].Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Lighting Maintenance

Clean lamps, reflectors and lenses of dirt, dust, oil, and smoke buildup every six to twelve months. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust. Together, this can reduce total light output by up to 60% while still drawing full power.

In addition to routine cleaning, developing a maintenance schedule can ensure that maintenance is performed regularly, and it can reduce the overall cost of fixture re-lamping and re-ballasting. Group re-lamping and re-ballasting maintains lighting levels and minimizes the number of site visits by a lighting technician or contractor, decreasing the overall cost of maintenance.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the water side or fire side of the boiler.

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense™ website[5] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[6] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. 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.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the facility is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense™ products where available.

[5] https://www.epa.gov/watersense

[6] https://www.epa.gov/watersense/watersense-work-0

6 On-site Generation

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the facility's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases reduction, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for your facility. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze 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 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

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.

This facility appears to not meet the minimum criteria for a cost-effective solar PV installation. To be cost-effective, a solar PV array needs certain minimum criteria, such as flat or south-facing rooftop or other unshaded space on which to place the PV panels.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.

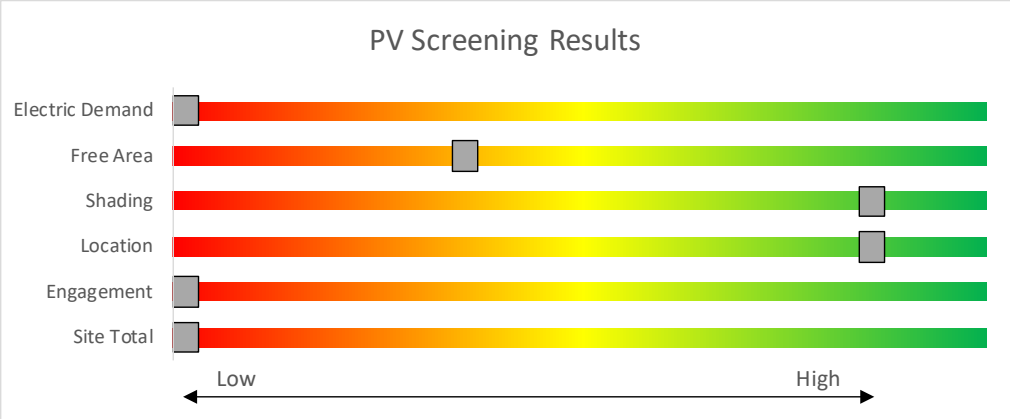


Figure 9 - Photovoltaic Screening

6.2 Combined Heat and Power

Combined heat and power (CHP) generates electricity at the facility and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need 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 **no potential** for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. The low and infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.

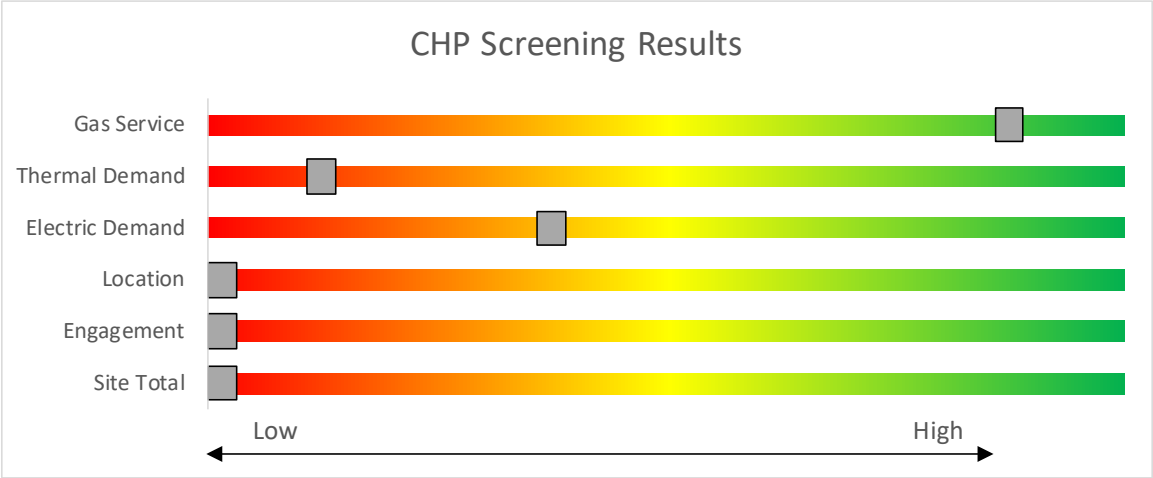


Figure 10 - Combined Heat and Power Screening

7 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? New Jersey's Clean Energy Programs can help. Pick the program that works best for you. Incentive programs that may apply to this facility are identified in the Executive Summary. This section provides an overview of currently available in New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.
Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.			

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at your facility. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy-efficient equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

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

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

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

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

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

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

7.3 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

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 described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

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 used 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. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program description and application can be found at: www.njcleanenergy.com/ESIP.

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

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 already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[7].

8.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. 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 typically depends on whether a customer prefers 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 does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[8].

[7] www.state.nj.us/bpu/commercial/shopping.html.

[8] 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	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	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
Transportation Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.4	619	0	$92	$511	$140	4.1
Sherrifs Office	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.0	110	0	$16	$98	$18	4.9
Hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Sherrifs Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.5	781	0	$116	$548	$150	3.4
Sherrifs Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	234	0	$35	$164	$45	3.4
Sherrifs Office	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
1st Floor Hall	5	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3, NR	Relamp	Yes	5	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	1,435	0.1	243	0	$36	$363	$30	9.2
1st Floor Hall	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
1st Floor Hall	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,080	3, NR	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,435	0.1	169	0	$25	$73	$20	2.1
Civil Process Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.3	530	0	$79	$438	$120	4.1
Civil Process Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
County Sherrifs Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
County Sherrifs Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	4.9
County Sherrifs Hallway	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3, NR	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	1,435	0.1	146	0	$22	$298	$18	12.9
Sherrifs Secretary Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,080	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	339	0	$50	$416	$75	6.8
Sherrifs Call Office	15	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3, 4	Relamp	Yes	15	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.3	730	0	$108	$758	$125	5.9
Sherrifs Call Office	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Front Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	234	0	$35	$164	$45	3.4
Front Office	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
Sheriffs Office 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	265	0	$39	$219	$60	4.1
Sheriffs Office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	177	0	$26	$146	$40	4.1
Photo Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	177	0	$26	$146	$40	4.1
Lieutenants Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	354	0	$52	$292	$80	4.1
Lieutenants Office 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	354	0	$52	$292	$80	4.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	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
Lieutenants Office 3	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	354	0	$52	$292	$80	4.1
Lieutenants Office 4	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	177	0	$26	$146	$40	4.1
Front Entry	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.0	76	0	$11	$37	$10	2.4
Sherriff Miller Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	354	0	$52	$292	$80	4.1
Sherriff Miller Office 2	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.3	530	0	$79	$438	$120	4.1
Mens Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
Break Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,435	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.1	156	0	$23	$110	$30	3.4
K9 Offices	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.3	769	0	$114	$562	$115	3.9
K9 Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.1	104	0	$15	$73	$20	3.4
Holding Cell3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.1	151	0	$22	$73	$20	2.4
Forensics Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.3	530	0	$79	$438	$120	4.1
Holding Cell 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,080	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,080	0.0	113	0	$17	$55	$15	2.4
Holding Cell 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,080	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,080	0.0	113	0	$17	$55	$15	2.4
Hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,080	3, NR	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,435	0.2	432	0	$64	$364	$45	5.0
Cell 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,080	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,080	0.1	227	0	$34	$110	$30	2.4
Computer Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.1	288	0	$43	$380	$65	7.4
Interview Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,080	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,080	0.0	113	0	$17	$55	$15	2.4
Sally Port	5	Linear Fluorescent - T12HO: 8' T12HO (110W) - 2L	Wall Switch	S	252	2,080	2, 4	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,435	1.0	2,315	0	$343	$913	$135	2.3
Tunnel to Courthouse	8	LED Screw-In Lamps: Two Lamp Screw-in	Wall Switch	S	18	2,080	NR	None	Yes	8	LED Screw-In Lamps: Two Lamp Screw-in	High/Low Control	18	1,435	0.0	102	0	$15	$400	$0	26.5
Elevator Room	2	Compact Fluorescent: One Lamp Screw-in	Wall Switch	S	30	1,000	3	Relamp	No	2	LED Screw-In Lamps: One Lamp Screw-in	Wall Switch	21	1,000	0.0	20	0	$3	$34	$2	11.1
Womens Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
Weight Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.4	865	0	$128	$599	$125	3.7
Weight Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,080	3, 4	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	144	0	$21	$55	$15	1.9
Mens Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
Reviewing Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.2	384	0	$57	$416	$75	6.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	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
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	4.9
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	4.9
Records Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.2	576	0	$85	$489	$95	4.6
Hallway	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3, NR	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,435	0.6	1,441	0	$213	$1,148	$150	4.7
Hallway	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Restroom	1	LED Screw-In Lamps: One Lamp Screw-in	Wall Switch	S	9	2,080		None	No	1	LED Screw-In Lamps: One Lamp Screw-in	Wall Switch	9	2,080	0.0	0	0	$0	$0	$0	0.0
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.0	52	0	$8	$37	$10	3.4
Boiler Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.3	755	0	$112	$365	$100	2.4
Pages Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	4.9
Pages Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	4.9
Evidence Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.0	76	0	$11	$37	$10	2.4
Armory	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.1	151	0	$22	$73	$20	2.4
Temporary Evidence	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3, 4	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.0	96	0	$14	$37	$10	1.9
Temporary Evidence	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.1	192	0	$28	$343	$55	10.1
File Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.1	73	0	$11	$73	$20	4.9
Storage Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,435	3	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.2	260	0	$39	$183	$50	3.4
Front Entry	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,080	3, NR	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,435	0.1	288	0	$43	$310	$30	6.6
Front Entry	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Front Entry	8	Compact Fluorescent: Two Lamp Screw-in	Wall Switch	S	26	2,080	3, NR	Relamp	Yes	8	LED Screw-In Lamps: Two Lamp Screw-in	High/Low Control	18	1,435	0.1	249	0	$37	$476	$16	12.5
3rd Flr File Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,435	3	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,435	0.2	417	0	$62	$292	$80	3.4
3rd Flr Office	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.1	146	0	$22	$130	$24	4.9
3rd Flr File Room	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.0	73	0	$11	$65	$12	4.9
3rd Flr Storage 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,000	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,000	0.2	246	0	$36	$292	$80	5.8
3rd Flr Storage 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.1	73	0	$11	$73	$20	4.9
Conference Room 306	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.4	619	0	$92	$511	$140	4.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	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
3rd Flr Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.0	37	0	$5	$33	$6	4.9
Hallway Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
Room 319	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	265	0	$39	$219	$60	4.1
Hallway	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Hallway	6	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3, NR	Relamp	Yes	6	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	1,435	0.1	292	0	$43	$395	$36	8.3
3rd Flr Mens Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
3rd Flr Womens Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
Room316	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	156	0	$23	$110	$30	3.4
Room 320	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	234	0	$35	$164	$45	3.4
Room 320 Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
Front Desk 325	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	76	0	$11	$98	$18	7.1
Recssed Can	2	LED Screw-In Lamps: One Lamp Screw-in	Wall Switch	S	9	2,080		None	No	2	LED Screw-In Lamps: One Lamp Screw-in	Wall Switch	9	2,080	0.0	0	0	$0	$0	$0	0.0
Room 324	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	156	0	$23	$110	$30	3.4
Kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	156	0	$23	$110	$30	3.4
Office 334	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Office 336	5	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.1	126	0	$19	$163	$30	7.1
Office 337	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	156	0	$23	$110	$30	3.4
Office 338	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Office 340	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Janitor Closet	1	Compact Fluorescent: Two Lamp Screw-in	Occupancy Sensor	S	26	1,435	3	Relamp	No	1	LED Screw-In Lamps: Two Lamp Screw-in	Occupancy Sensor	18	1,435	0.0	13	0	$2	$34	$2	17.4
M2nd FLr Mens Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	76	0	$11	$98	$18	7.1
2nd Flr Womens Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
Office 327	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Office 307	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	354	0	$52	$292	$80	4.1
Office 301	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.3	442	0	$65	$365	$100	4.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	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
Fugitive Unit	7	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.1	341	0	$50	$498	$77	8.3
Hallway	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,080	3, NR	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,435	0.1	144	0	$21	$55	$15	1.9
Hallway	2	LED Screw-In Lamps: One Lamp Screw-in	Wall Switch	S	9	2,080	NR	None	Yes	2	LED Screw-In Lamps: One Lamp Screw-in	High/Low Control	9	1,435	0.0	13	0	$2	$200	$0	105.8
Stairwell	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.2	378	0	$56	$183	$50	2.4
Surrogates Court	5	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3	Relamp	No	5	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,080	0.1	183	0	$27	$163	$30	4.9
Surrogates Court	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Surrogate Court Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.3	530	0	$79	$438	$120	4.1
Surrogate Court Office	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	76	0	$11	$98	$18	7.1
Surrogate Court Conference Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	234	0	$35	$164	$45	3.4
Deputy Surrogate Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.1	156	0	$23	$110	$30	3.4
Burke Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Kitchen Area	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
Kitchen Area	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	88	0	$13	$73	$20	4.1
Rosenstock Offfice	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Rosenstock Offfice	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
Kitchen Area 2	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
Family Room 2	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.3	530	0	$79	$438	$120	4.1
Family Room 2	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
Family Room Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	88	0	$13	$73	$20	4.1
Family Room 3	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.3	530	0	$79	$438	$120	4.1
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	88	0	$13	$73	$20	4.1
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	177	0	$26	$146	$40	4.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	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
Superintendent	9	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,080	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.2	438	0	$65	$563	$89	7.3
Hallway	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Office 204	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	354	0	$52	$292	$80	4.1
Conference Room 203	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	265	0	$39	$219	$60	4.1
Conference Room 203	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
Conference Room Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	25	0	$4	$33	$6	7.1
Kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.1	177	0	$26	$146	$40	4.1
Kitchen Closet	1	Compact Fluorescent: Two Lamp Pin-base	Wall Switch	S	18	1,000	3	Relamp	No	1	LED Screw-In Lamps: Two Lamp Pin-base	Wall Switch	13	1,000	0.0	6	0	$1	$38	$0	46.7
Womens Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	76	0	$11	$98	$18	7.1
Mens Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	76	0	$11	$98	$18	7.1
Custodial Closet	1	Compact Fluorescent: Two Lamp Pin-base	Occupancy Sensor	S	18	1,435	3	Relamp	No	1	LED Screw-In Lamps: Two Lamp Pin-base	Occupancy Sensor	13	1,435	0.0	8	0	$1	$38	$0	32.5
Superintendent of Schools	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.6	1,061	0	$157	$876	$240	4.1
Superintendent of Schools	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,435	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,435	0.0	51	0	$7	$65	$12	7.1
Superintendent Office 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Superintendent Office 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,435	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,435	0.2	313	0	$46	$219	$60	3.4
Superintendent Office 3	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	354	0	$52	$292	$80	4.1
Superintendent Office 4	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.4	619	0	$92	$511	$140	4.1
Confernce Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,435	3	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,435	0.2	265	0	$39	$219	$60	4.1
Stairwell 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,080	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,080	0.1	128	0	$19	$73	$20	2.8
Stairwell 2	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,080	3	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,080	0.2	378	0	$56	$183	$50	2.4
Wall Pack	2	Metal Halide: (1) 100W Lamp	None		128	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	38	4,380	0.1	785	0	$118	$1,932	$200	14.7
Building Lights	12	Metal Halide: (1) 100W Lamp	None		128	4,380	1	Fixture Replacement	No	12	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	None	38	4,380	0.8	4,709	0	$708	$11,592	$1,200	14.7
Door Lights	2	LED Screw-In Lamps: One Lamp Screw-in	None		20	4,380		None	No	2	LED Screw-In Lamps: One Lamp Screw-in	None	20	4,380	0.0	0	0	$0	$0	$0	0.0
Pole Mounted Shoebox	10	High-Pressure Sodium: (1) 100W Lamp	None		138	4,380	1	Fixture Replacement	No	10	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	None	41	4,380	0.7	4,231	0	$636	$9,306	$1,000	13.1
Pole Mounted Shoebox	1	High-Pressure Sodium: (1) 150W Lamp	None		188	4,380	1	Fixture Replacement	No	1	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	None	56	4,380	0.1	576	0	$87	$931	$100	9.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	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
Pole Mounted Shoebox	4	High-Pressure Sodium: (1) 250W Lamp	None		295	4,380	1	Fixture Replacement	No	4	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	None	89	4,380	0.6	3,618	0	$544	$3,722	$400	6.1
Pole Mounted Shoebox	2	High-Pressure Sodium: (2) 250W Lamp	None		590	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	None	177	4,380	0.6	3,618	0	$544	$1,861	$200	3.1
Pole Mounted Cobrahead	3	High-Pressure Sodium: (1) 100W Lamp	None		138	4,380	1	Fixture Replacement	No	3	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	None	41	4,380	0.2	1,269	0	$191	$2,792	$300	13.1
Pole Mounted Cobrahead	2	High-Pressure Sodium: (1) 150W Lamp	None		188	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	None	56	4,380	0.2	1,153	0	$173	$1,861	$200	9.6

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?	Remaining Useful Life	Annual Operating Hours	ECM #	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	Boilers	2	Combustion Air Fan	1.5	80.0%	No	B	2,745		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Basement	Hot Water Supply	2	Heating Hot Water Pump	3.0	90.2%	No	B	2,745		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
Basement	Chilled Water	2	Chilled Water Pump	5.0	89.5%	No	B	2,745	NR, 5	Yes	89.5%	Yes	2	1.9	8,580	0	$1,291	$8,152	$0	6.3
Basement	Hot Water Return	2	Heating Hot Water Pump	0.2	68.5%	No	W	2,745		No	68.5%	No		0.0	0	0	$0	$0	$0	0.0
Elevator Room	Elevator	1	Other	25.0	75.0%	No	W	1,000		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HRU-1, 2	2	Supply Fan	1.5	84.0%	No	B	2,745	NR	Yes	86.5%	No		0.0	159	0	$24	$1,516	$0	63.6
Roof	HRU-1, 2	2	Exhaust Fan	2.0	84.0%	No	B	2,745	NR	Yes	86.5%	No		0.1	211	0	$32	$1,064	$0	33.5
Multiple Locations	Air Handlers/Fan Coils	3	Supply Fan	7.5	88.5%	No	W	3,391		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0

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 (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	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	Supplementary cooling	1	Ductless Mini-Split AC	1.00		W		No							0.0	0	0	$0	$0	$0	0.0
Outside	Supplementary cooling	1	Ductless Mini-Split AC	2.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Supplementary cooling	1	Ductless Mini-Split AC	1.00		W		No							0.0	0	0	$0	$0	$0	0.0

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)	Remaining Useful Life	ECM #	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	Entire Facility	2	Non-Condensing Hot Water Boiler	1,763.50	B	NR	Yes	2	Non-Condensing Hot Water Boiler	1,763.50	85.00%	Et	0.0	0	150	$1,716	$62,962	$5,291	33.6

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Remaining Useful Life	ECM #	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	Entire Facility	1	Storage Tank Water Heater (≤ 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	6	3	Faucet Aerator (Lavatory)	3.00	0.50	0.0	0	13	$144	$22	$0	0.1

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Multiple Locations	61	desktop	75.0	
Multiple Locations	6	paper shredder	360.0	
Multiple Locations	8	copier	515.0	
Multiple Locations	10	water cooler	500.0	
Multiple Locations	8	mini fridge	30.0	
Multiple Locations	10	microwave	1,000.0	
Break Area	1	toaster oven	1,200.0	
Multiple Locations	7	coffee maker	400.0	
Multiple Locations	4	refrigerator	600.0	
Multiple Locations	14	printer	20.0	
Multiple Locations	2	LCD TV	120.0	
Office	1	projector	200.0	
Office	1	laptop	40.0	
Entry Way	1	Electric Lift	1,600.0	

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Break Area	1	Non-Refrigerated	7	Yes	0.0	343	0	$52	$230	$0	4.5
Break Area	1	Refrigerated	7	Yes	0.2	1,612	0	$242	$230	$0	0.9

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

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ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Salem County Administrative Building

Primary Property Type: Office
Gross Floor Area (ft²): 21,285
Built: 1958

For Year Ending: June 30, 2017
Date Generated: February 04, 2019

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Salem County Administrative Building 94 Market Street Salem, New Jersey 08079	County of Salem 110 Fifth Street, Suite 400 Salem, NJ 08079 856-935-7510	Debby Turner 110 Fifth Street, Suite 400 Salem, NJ 08079 856-935-7510 Ext. 8601 Debby.Turner-Fox@salemcountynj.gov

Property ID: 6667572

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
86.8 kBtu/ft²

Source EUI
156.1 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	1,056,667 (57%)
Electric - Grid (kBtu)	790,242 (43%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	70.9
National Median Source EUI (kBtu/ft²)	127.5
% Diff from National Median Source EUI	22%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	136

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gases:* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.
gpf	*Gallons per flush*

gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense™	The symbol for water efficiency. The WaterSense™ program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.