Local Government Energy Audit Report

Atlantic County Civil Courthouse

April 30, 2024

Prepared for:

Atlantic County
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Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities and help prioritize specific measures for implementation. 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 reviewed the energy conservation measures and estimates of energy savings 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 material and labor costs primarily on RS Means cost manuals as well as on our experience at similar facilities. This approach is based on standard cost estimating manuals and is vendor neutral. Cost estimates include material and labor pricing associated with one for one equipment replacements. Cost estimates do not include demolition or removal of hazardous waste. The actual implementation costs for energy savings projects are anticipated to be significantly higher based on the specific conditions at your site(s). We strongly recommend that you work with your design engineer or contractor to develop actual project costs for your specific scope of work for the installation of high efficiency equipment. We encourage you to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on selected products and installers. TRC and NJBPU do not guarantee cost estimates and shall in no event be held liable should actual installed costs vary from these material and labor estimates.

Incentive values provided in this report are estimated based on previously run state efficiency programs. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available utility program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

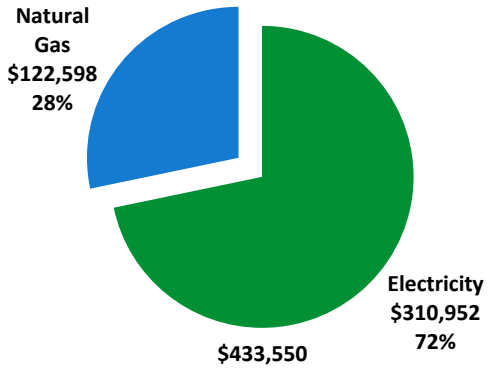
The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state, and federal requirements.

Table of Contents

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Atlantic County Civil Courthouse. 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 conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $433,550 Electricity: 2,375,032 kWh Natural Gas: 91,183 Therms	
ENERGY STAR® Benchmarking Score	35 *(1-100 scale)*	This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

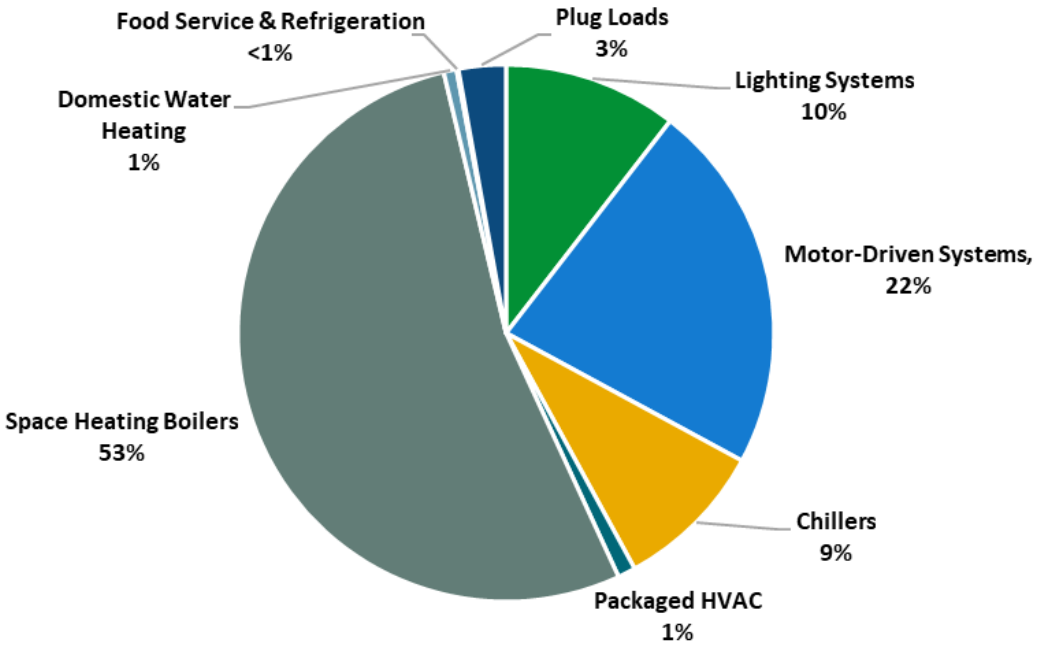


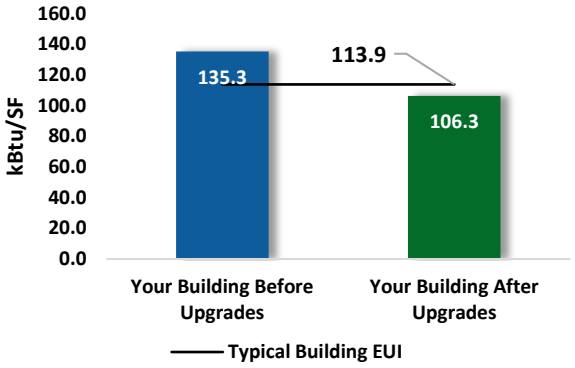
Figure 1 - Energy Use by System

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.

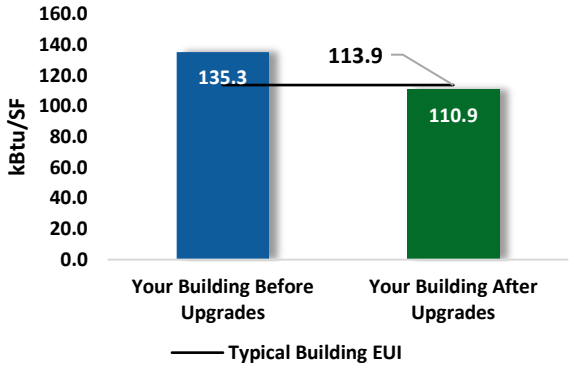
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$806,593
Potential Rebates & Incentives[1]	$82,921
Annual Cost Savings	$130,038
Annual Energy Savings	Electricity: 945,599 kWh Natural Gas: 4,637 Therms
Greenhouse Gas Emission Savings	503 Tons
Simple Payback	5.6 Years
Site Energy Savings (All Utilities)	21%



Scenario 2: Cost Effective Package[2]

Installation Cost	$637,826
Potential Rebates & Incentives	$77,966
Annual Cost Savings	$121,051
Annual Energy Savings	Electricity: 931,619 kWh Natural Gas: -686 Therms
Greenhouse Gas Emission Savings	465 Tons
Simple Payback	4.6 Years
Site Energy Savings (all utilities)	18%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on previously run state rebate programs. Contact your utility provider for current program incentives that 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	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**297,639**	**65.6**	**-63**	**$38,128**	**$86,604**	**$21,576**	**$65,028**	**1.7**	**292,401**
ECM 1	Install LED Fixtures	Yes	4,128	0.0	0	$540	$1,782	$30	$1,752	3.2	4,157
ECM 2	Retrofit Fixtures with LED Lamps	Yes	293,511	65.6	-63	$37,588	$84,822	$21,546	$63,276	1.7	288,244
Lighting Control Measures			**78,333**	**16.7**	**-17**	**$10,031**	**$85,593**	**$27,920**	**$57,673**	**5.7**	**76,927**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	57,457	12.8	-12	$7,358	$58,368	$7,550	$50,818	6.9	56,426
ECM 4	Install High/Low Lighting Controls	Yes	20,876	3.9	-4	$2,673	$27,225	$20,370	$6,855	2.6	20,501
Motor Upgrades			**1,017**	**0.2**	**0**	**$133**	**$5,924**	**$0**	**$5,924**	**44.5**	**1,024**
ECM 5	Premium Efficiency Motors	No	1,017	0.2	0	$133	$5,924	$0	$5,924	44.5	1,024
Variable Frequency Drive (VFD) Measures			**279,522**	**41.3**	**0**	**$36,597**	**$145,134**	**$18,975**	**$126,159**	**3.4**	**281,476**
ECM 6	Install VFD on Variable Air Volume (VAV) Fans	Yes	36,200	7.5	0	$4,740	$22,224	$3,200	$19,024	4.0	36,453
ECM 7	Install VFDs on Constant Volume (CV) Fans	No	1,579	0.3	0	$207	$3,508	$75	$3,433	16.6	1,590
ECM 8	Install VFDs on Chilled Water Pumps	Yes	179,032	28.7	0	$23,440	$72,961	$9,700	$63,261	2.7	180,284
ECM 9	Install VFDs on Heating Water Pumps	Yes	54,327	5.2	0	$7,113	$31,748	$4,600	$27,148	3.8	54,707
ECM 10	Install VFDs on Cooling Tower Fans	No	8,383	-0.4	0	$1,098	$14,693	$1,400	$13,293	12.1	8,442
Unitary HVAC Measures			**3,000**	**0.8**	**0**	**$393**	**$4,044**	**$0**	**$4,044**	**10.3**	**3,021**
ECM 11	Install High Efficiency Air Conditioning Units	No	3,000	0.8	0	$393	$4,044	$0	$4,044	10.3	3,021
Electric Chiller Replacement			**257,810**	**132.5**	**0**	**$33,754**	**$329,999**	**$10,500**	**$319,499**	**9.5**	**259,613**
ECM 12	Install High Efficiency Chillers	Yes	257,810	132.5	0	$33,754	$329,999	$10,500	$319,499	9.5	259,613
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**532**	**$7,157**	**$140,598**	**$3,481**	**$137,117**	**19.2**	**62,323**
ECM 13	Install High Efficiency Hot Water Boilers	No	0	0.0	532	$7,157	$140,598	$3,481	$137,117	19.2	62,323
HVAC System Improvements			**4,449**	**0.0**	**3**	**$629**	**$744**	**$115**	**$629**	**1.0**	**4,884**
ECM 14	Install Pipe Insulation	Yes	4,449	0.0	3	$629	$744	$115	$629	1.0	4,884
Domestic Water Heating Upgrade			**7,785**	**0.0**	**7**	**$1,115**	**$509**	**$255**	**$255**	**0.2**	**8,673**
ECM 15	Install Low-Flow DHW Devices	Yes	7,785	0.0	7	$1,115	$509	$255	$255	0.2	8,673
Food Service & Refrigeration Measures			**3,909**	**0.4**	**0**	**$512**	**$920**	**$100**	**$820**	**1.6**	**3,936**
ECM 16	Vending Machine Control	Yes	3,909	0.4	0	$512	$920	$100	$820	1.6	3,936
Custom Measures			**12,135**	**0.0**	**0**	**$1,590**	**$6,523**	**$0**	**$6,523**	**4.1**	**12,220**
ECM 17	Replace Electric Water Heater with Heat Pump Water Heater	Yes	12,135	0.0	0	$1,590	$6,523	$0	$6,523	4.1	12,220
TOTALS (COST EFFECTIVE MEASURES)			**931,619**	**256.6**	**-69**	**$121,051**	**$637,826**	**$77,966**	**$559,860**	**4.6**	**930,099**
TOTALS (ALL MEASURES)			**945,599**	**257.5**	**464**	**$130,038**	**$806,593**	**$82,921**	**$723,672**	**5.6**	**1,006,499**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures.**

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

Utility-run energy efficiency programs and 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.

Options from Your Utility Company

Prescriptive and Custom Rebates

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 Prescriptive and Custom Rebates 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 may be required for some incentives. Contact your utility company for more details prior to project installation.

Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized contractor. This program can provide incentives up to 70% or 80% of the cost of selected measures. A Direct Install contractor will assess and verify individual measure eligibility and perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Engineered Solutions

The Engineered Solutions program provides tailored energy-efficiency assistance and turnkey engineering services to municipalities, universities, schools, hospitals, and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. The program provides all professional services from audit, design, construction administration, to commissioning and measurement and verification for custom whole-building energy-efficiency projects. Engineered Solutions 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.

For more details on these programs please contact your utility provider.

Options from New Jersey's Clean Energy Program

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 and Power (CHP)

The CHP program provides incentives for combined heat and power (i.e., 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.

Successor Solar Incentive Program (SuSI)

New Jersey is committed to supporting solar energy. Solar projects help the state reach the renewable goals outlined in the state's Energy Master Plan. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available, but certified solar projects are able to earn one SREC II (Solar Renewable Energy Certificates II) for each megawatt-hour of solar electricity produced from a qualifying solar facility.

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 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.

Large Energy User Program (LEUP)

LEUP is designed to promote self-investment in energy efficiency. It incentivizes owners/users of buildings to upgrade or install energy conserving measures in existing buildings to help offset the capital costs associated with the project. The efficiency upgrades are customized to meet the requirements of the customers' existing facilities, while advancing the State's energy efficiency, conservation, and greenhouse gas reduction goals.

For more details on these programs please visit New Jersey's Clean Energy Program website .

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Atlantic County Civil Courthouse. 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.

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 February 28, 2023, TRC performed an energy audit at Atlantic County Civil Courthouse located in Atlantic City, New Jersey. TRC met with Ed Heller to review the facility operations and help focus our investigation on specific energy-using systems.

Atlantic County Civil Courthouse is a three-story, 127,260 square foot building built in 1975. Spaces include offices, conference rooms, lounges, court rooms, holding cells, a sally port, staff kitchen, dining area, corridors, stairwells, atriums, restrooms, locker rooms, storage rooms, and electrical and mechanical spaces.

Lighting for the facility is provided mainly by linear fluorescent T8 fixtures with electronic ballasts. Two chillers and two boilers provide cooling and heating to most spaces. The building has a generator to provide emergency backup electricity. There are six passenger elevators located in the facility.

2.2 Building Occupancy

The facility is occupied year-round from 6:30 AM until 6:00 PM on weekdays, with a typical occupancy of 326 staff. The facility has limited use on weekends.

Building Name	Weekday/Weekend	Operating Schedule
Atlantic County Civil Courthouse	Weekday	6:30 AM - 6:00 PM
	Weekend	Limited Use

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a brick facade. The roof is flat, partially covered with stone ballast, and in fair condition. The windows are double glazed and have aluminum frames with thermal breaks. 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 are metal and glass with metal frames and are in good condition with undamaged door seals. Overall, the building envelope appears in fair condition.

Building Walls

Building Windows

Entrance Doors

Exit Doors

Roof

2.4 Lighting Systems

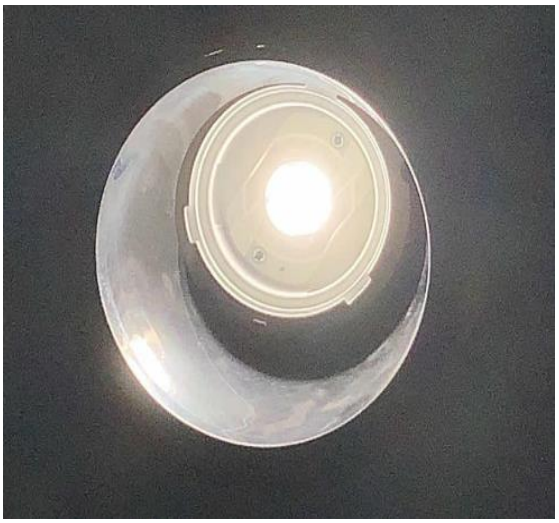
The primary interior lighting system uses 32-Watt fluorescent T8 lamps. Fixture types include 1-lamp, 2-lamp, and 4-lamp, 4-foot long recessed, surface mounted, and pendant fixtures with linear and U-bend tube lamps. Typically, T8 fluorescent lamps use electronic ballasts.

Additionally, lighting in some areas throughout the facility have been replaced over time with LED lamps. Compact fluorescent lamps (CFL) and incandescent lamps are also used in some spaces. Typically, CFLs at this site use 13-Watts, while incandescent lamps draw 65-Watts. Exit signs use LED sources.

Interior light fixtures are primarily controlled by manual wall switches, with some occupancy sensors used for restrooms on the second floor. All light fixtures are in good condition. Interior lighting levels were generally sufficient. Exterior fixtures use metal halide (MH), and LED lamps. Exterior fixtures are timer controlled.

Fluorescent T8 Fixtures

Incandescent Lamp



LED Lamps

Exterior MH Fixture

LED Fixture

2.5 Air Handling Systems

Unitary Electric HVAC Equipment

Electric room 115W is cooled using a 2.5-ton Mitsubishi mini split air conditioning (AC) unit with an estimated efficiency of 9 EER. The unit is thermostatically controlled and in fair condition.

Electric room 308 is conditioned using a Daikin mini split heat pump (HP) unit. The unit has a cooling capacity of 3 tons with a cooling efficiency of 15.9 EER, and a heating capacity of 36 MBH with a heating efficiency of 9.2 HSPF. Installed in 2017, the unit is thermostatically controlled and in good condition.

Mini-split Units

Unitary Heating Equipment

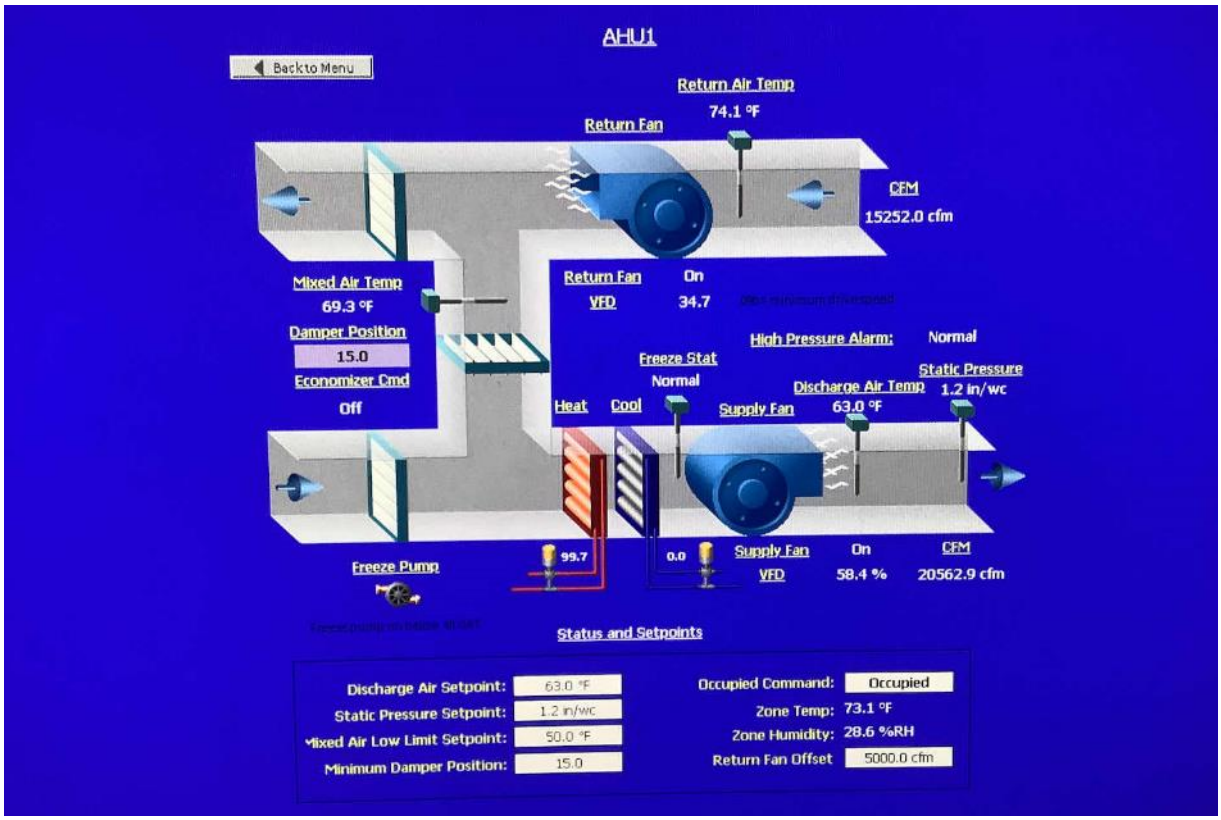
Mechanical rooms 125 and 128 and office 337W are heated supplementally using electric resistance heaters. The units' range in heating capacity from 5.0 kW to 7.5 kW. Equipment is thermostatically controlled and in good condition.

Electric Resistance Heaters

Air Handling Units (AHUs)

The facility is conditioned using six air handling units (AHUs) equipped with hot water heating coils and chilled water-cooling coils. AHU-1 and AHU-2 are each equipped with a 60 hp constant speed supply fan, a 20 hp constant speed return fan, and a fractional hp constant speed hot water heating pump. AHU-2A, AHU-2B, AHU-3A, and AHU-3B are each equipped with constant speed supply fans between 3 hp and 10 hp. The units are in fair to good condition and are monitored and controlled using the facility BAS.

Air Handling Unit



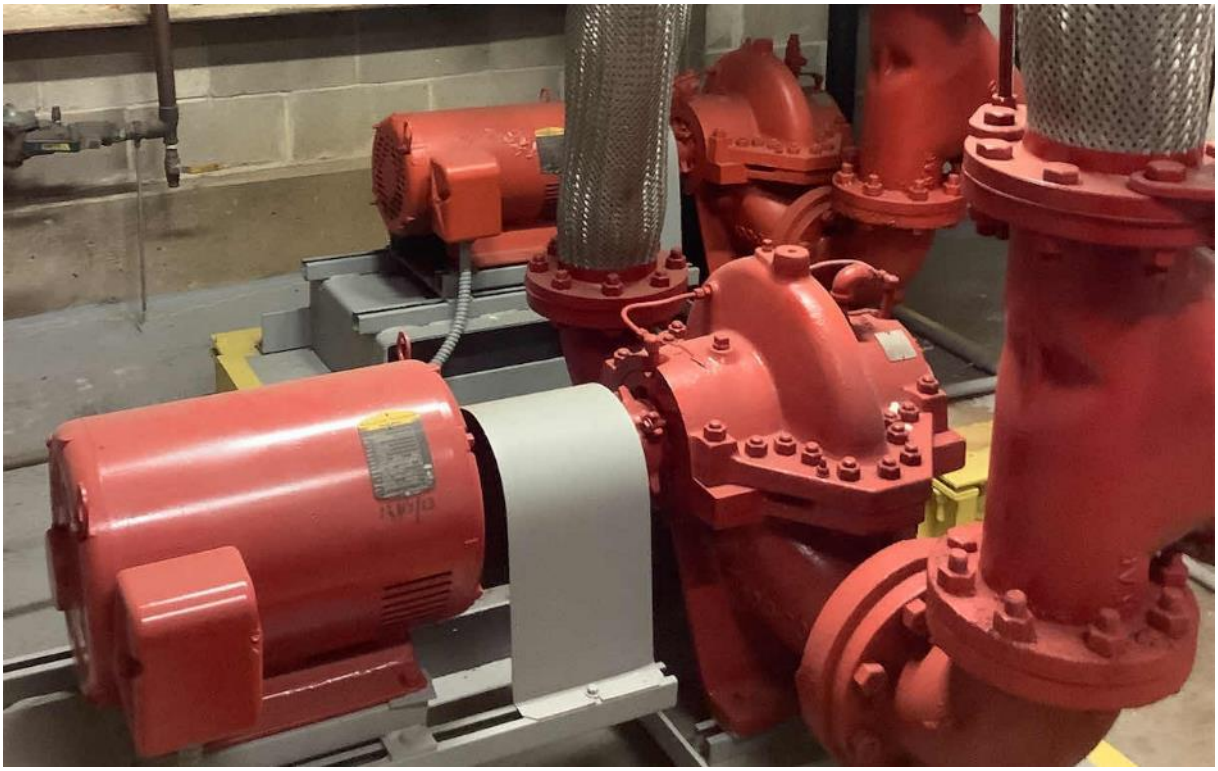
Air Handling Unit EMS Diagram View

2.6 Heating Hot Water Systems

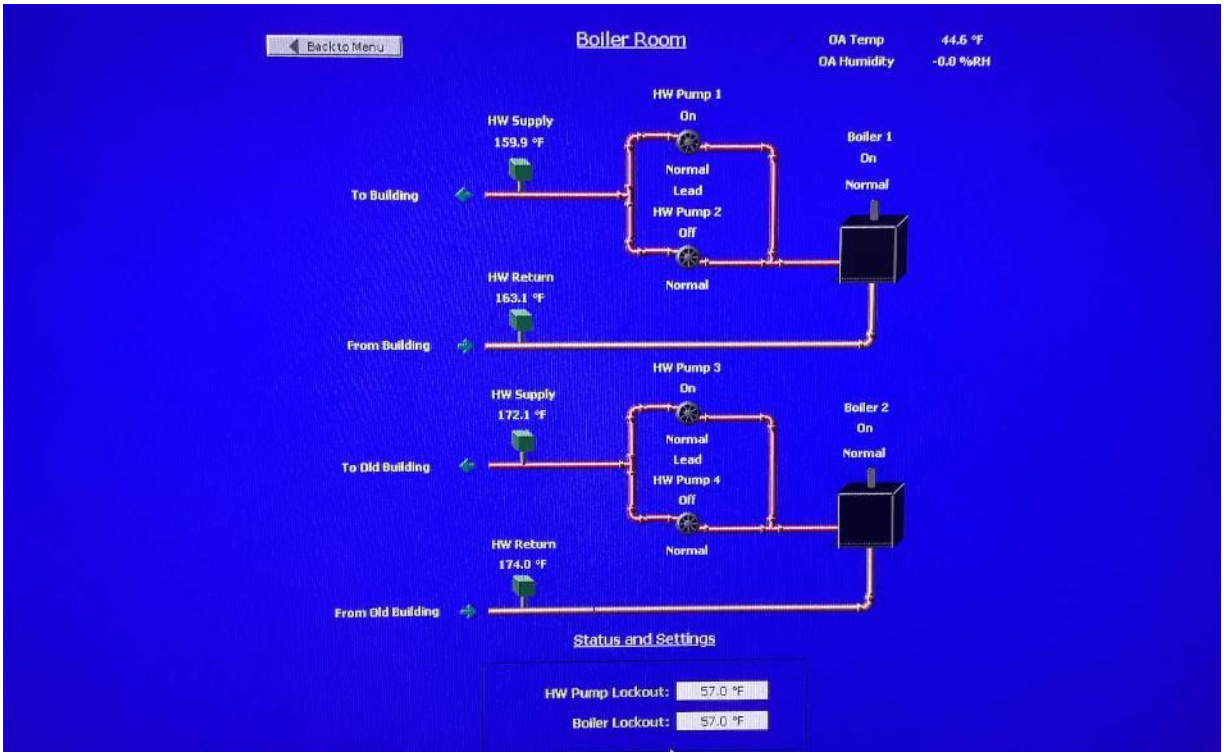
The building heating system consists of two Cleaver Brooks gas-fired fire-tube hot water boilers (Boiler #1 and #2), with output capacities of 4,184.0 MBh and 2,677.6 MBh, respectively. The burners are fully modulating with a nominal efficiency of 80$. The boilers are configured in an automated control scheme and controlled by the facility's BAS. Boiler #1 provides hot water to the new section of the building, while Boiler #2 serves the old section. Installed in 1985 and 1975, the boilers are in fair condition and have been recommended for replacement. There is a service contract in place.

The boilers are configured in a constant flow primary distribution with one fractional hp constant speed hot water pump connected to each boiler (BP-1 and BP-2), two, 10 hp constant speed hot water pumps (HWP-1 and HWP-2) operating with a lead-lag control scheme for Boiler #1, and two, 15 hp constant speed hot water pumps (HWP-3 and HWP-4) operating with a lead-lag control scheme for Boiler #2. The boilers provide hot water to air handling units, radiators, and unit heaters throughout the facility.

Hot Water Boiler



Heating Hot Water Pumps



Heating Hot Water System EMS Diagram View

2.7 Chilled Water Systems

The chiller plant consists of one, 150-ton York variable speed, water-cooled centrifugal chiller (Chiller #1) and one, 200-ton Trane variable speed, water-cooled centrifugal chiller (Chiller #2). The chillers are configured in a primary distribution loop with two, 15 hp constant flow chilled water pumps (CHWP-4 and CHWP-5) operating with a lead-lag control scheme.

The condenser water system consists of a one-cell cooling tower (CT-1) equipped with a 25 hp constant speed fan. Condenser water is supplied to the chillers by one, 20 hp constant speed pump (CWP-1) and two, 50 hp constant speed pumps (CWP-2 and CWP-3).

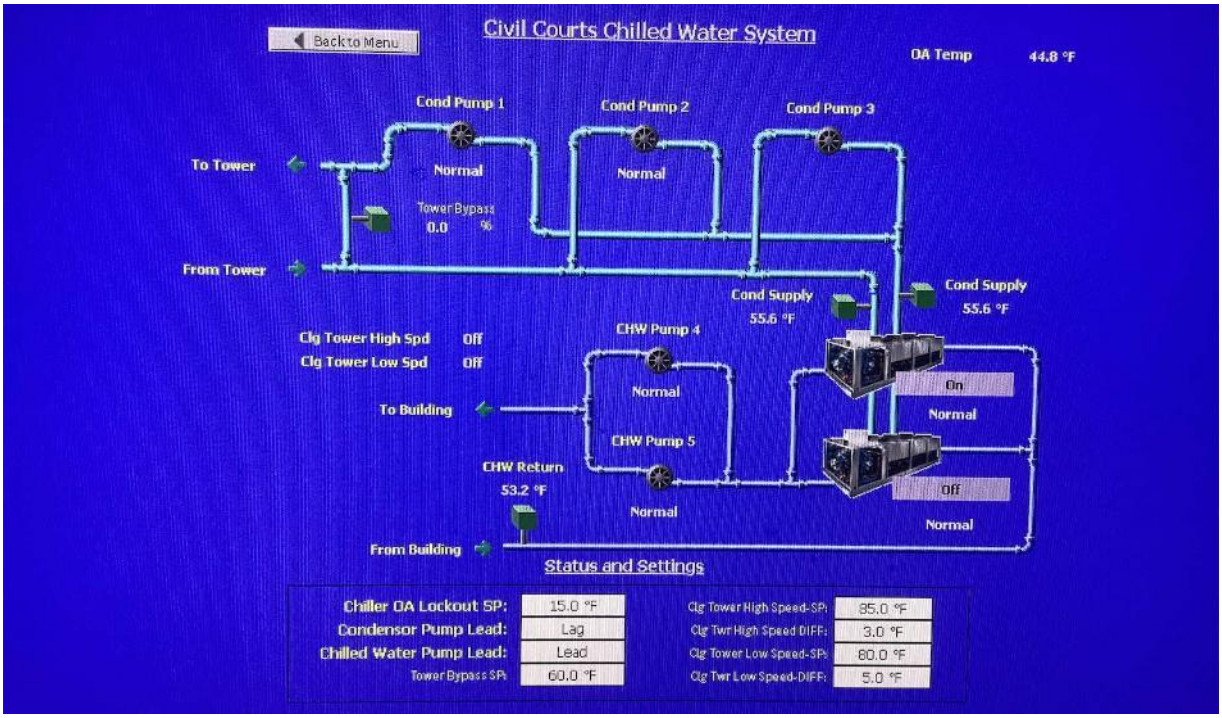
The chillers supply chilled water to the air handling units throughout the building. The chilled water temperatures and chiller operating schedules are controlled by the facility BAS. Installed in 2001 and 1975, the chillers are in fair condition and have been recommended for replacement.

Water-cooled Chiller

Chilled Water Pumps

Condenser Water Pumps

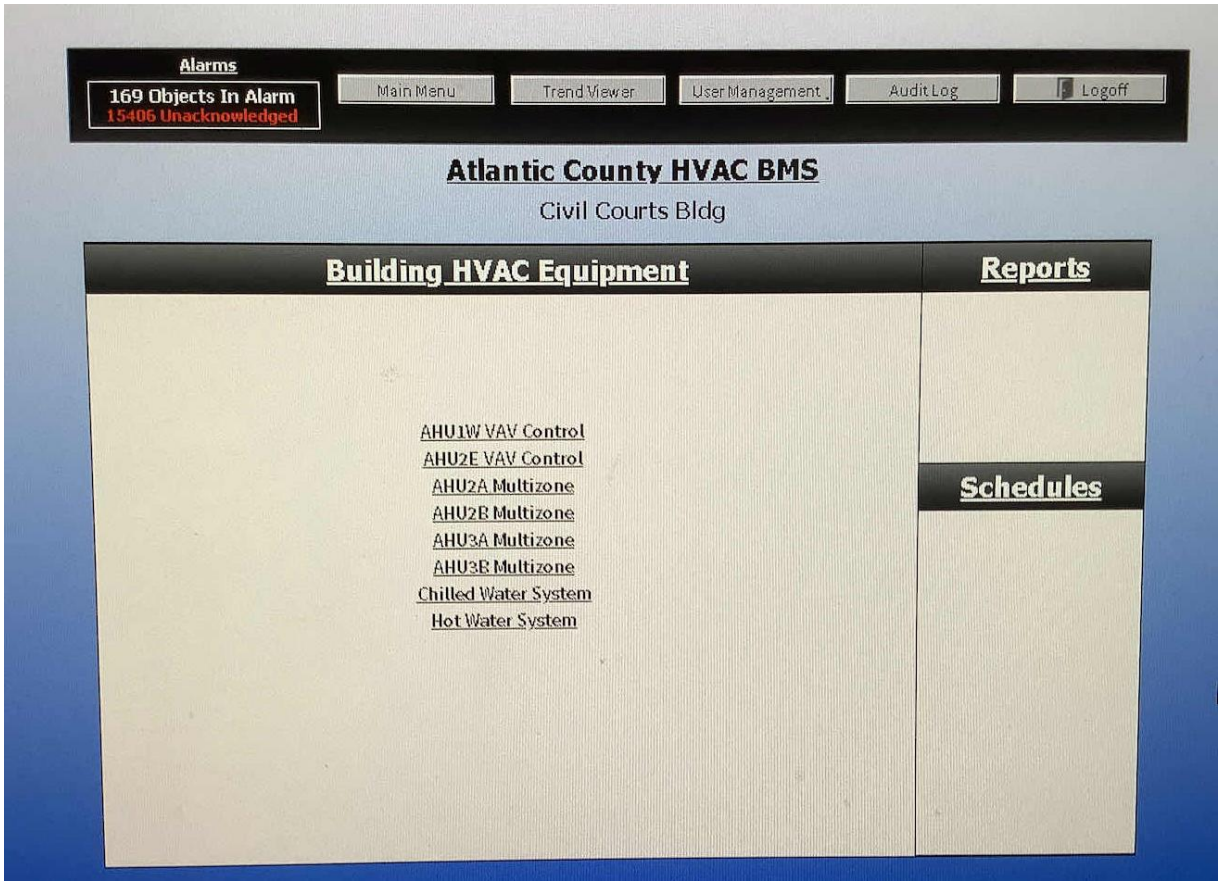
Cooling Tower



Chilled Water System EMS Diagram View

2.8 Building Automation System (BAS)

A Johnson Controls BAS controls the HVAC equipment, boilers, chillers, and air handlers. The BAS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, and humidity, heating water loop temperatures, and chilled water loop temperatures.



Building Energy Management System for Atlantic County Civil Courthouse

2.9 Domestic Hot Water

Hot water for the facility is produced by one gas-fired instantaneous water heater, and five electric storage water heaters. The instantaneous water heater has a 180 MBh capacity with a nominal efficiency of 96%. The electric storage water heaters range in capacity from 1.5 kW to 9 kW, with storage capacities between 19 gallons and 50 gallons. One fractional hp circulation pump distributes water to end uses. The circulation pump operates continuously. An automatic domestic water booster pump system with two, 7.5 hp variable speed-controlled pumps maintain domestic water pressure in the building.

The units are in fair to good condition. The domestic hot water pipes are partially insulated, and the insulation is in good condition. Section 4 includes a discussion about replacing some of the electric storage water heaters with heat pump water heaters. Refer to Appendix A for detailed information about each unit.



Water Heaters

2.10 Refrigeration

Dining area 259E has two stand-up refrigerators with glass doors. Equipment is standard efficiency and in good condition.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high efficiency food service equipment.

Stand-up Refrigerators

2.11 Plug Load and Vending Machines

The location is doing a great job managing the electrical plug loads. This report makes additional suggestions for ECMs in this area as well as energy efficient best practices.

There are 361 computer workstations throughout the facility. Plug loads throughout the building include general cafe and office equipment. There are classroom typical loads such as projectors and smartboards, and typical office loads such as copiers, printers, microwaves, televisions, and mini fridges.

There are eleven residential-style refrigerators throughout the building that are used to store food and drinks. These vary in condition and efficiency.

There are two refrigerated beverage vending machines and two non-refrigerated vending machines. Vending machines are not equipped with occupancy-based controls.

Vending Machine

Residential-style Refrigerator

2.12 Water-Using Systems

There are 45 restrooms with toilets, urinals, and sinks. Faucet flow rates are at 2.2 gallons per minute (gpm) or higher.

Typical Restroom Sinks

2.13 On-Site Generation

Atlantic County Civil Courthouse has a 95-kW photovoltaic (PV) array located on the roof. This system provides approximately 5% of the electricity used.

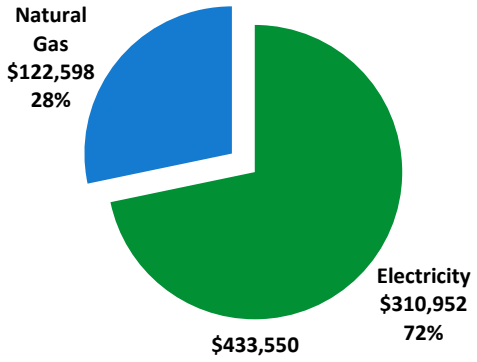
Atlantic County Civil Courthouse has an emergency generator that, in the event of a power outage, serves the entire building and is only used for emergency needs.

Rooftop Solar Panels

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	2,375,032 kWh	$310,952
Natural Gas	91,183 Therms	$122,598
Total		**$433,550**



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.

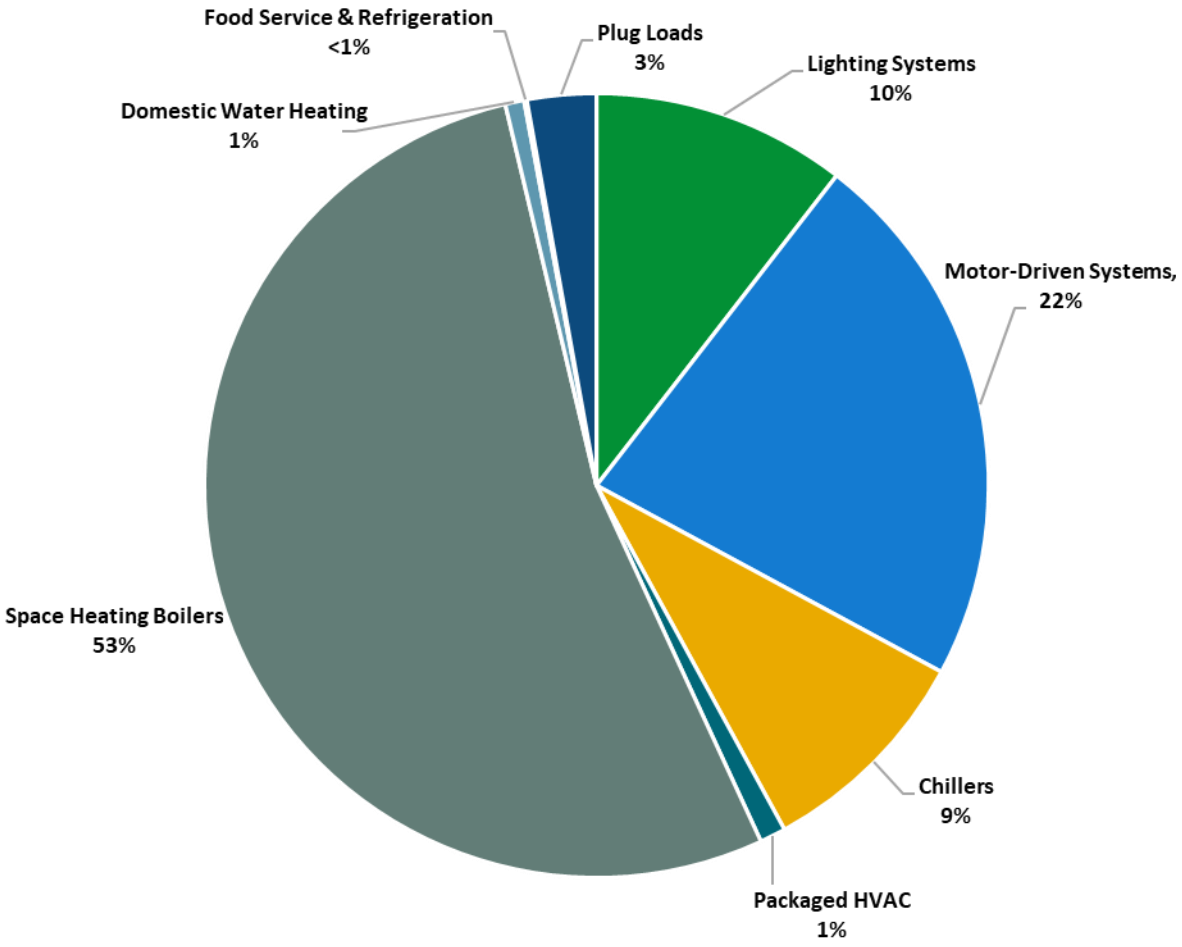
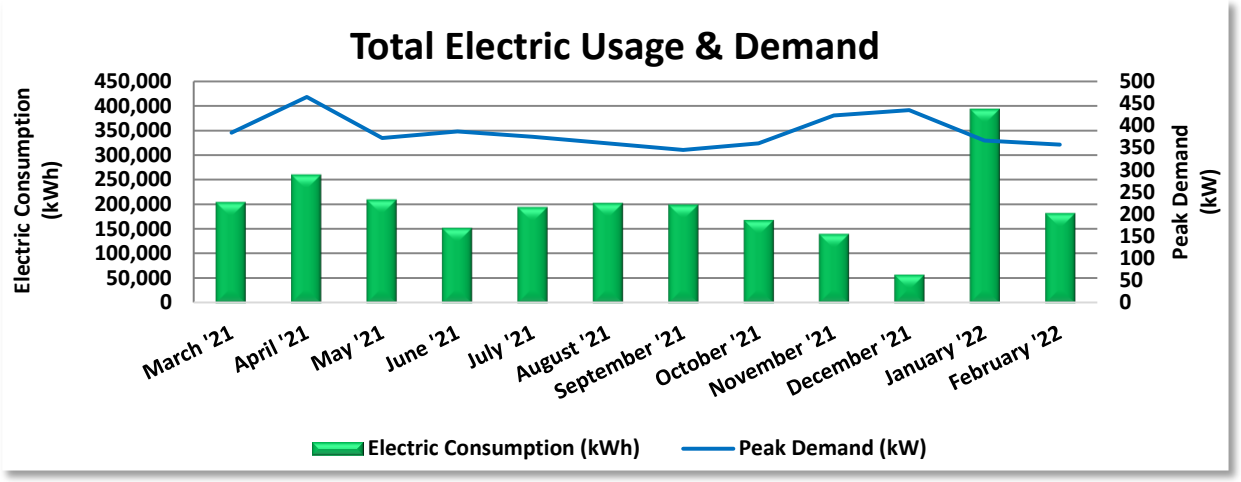
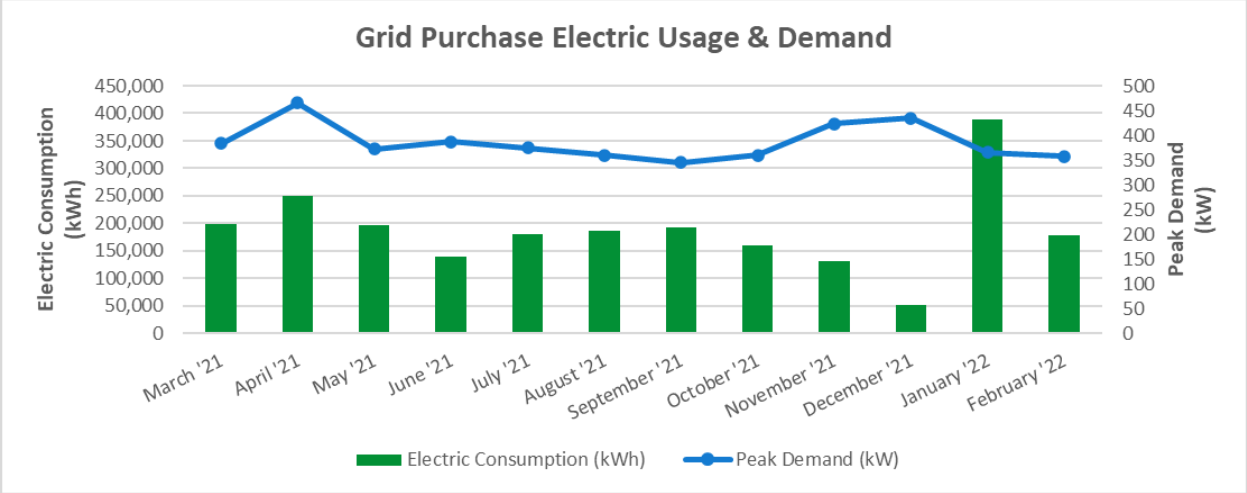


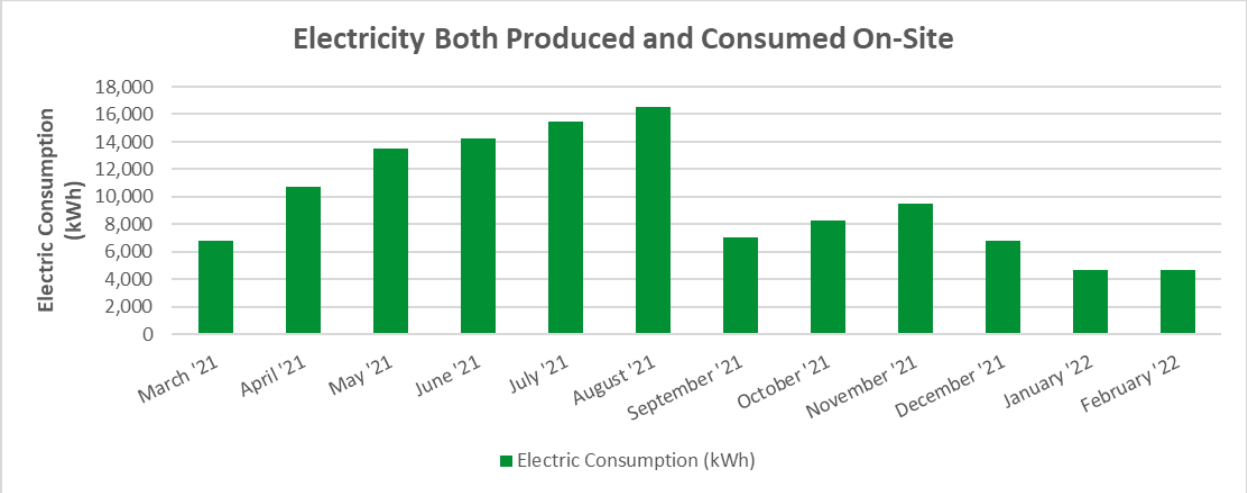
Figure 4 - Energy Balance

3.1 Electricity

Atlantic City Electric delivers electricity under rate class Annual General Service Secondary (GSS), with electric production provided by Constellation, a third-party supplier.







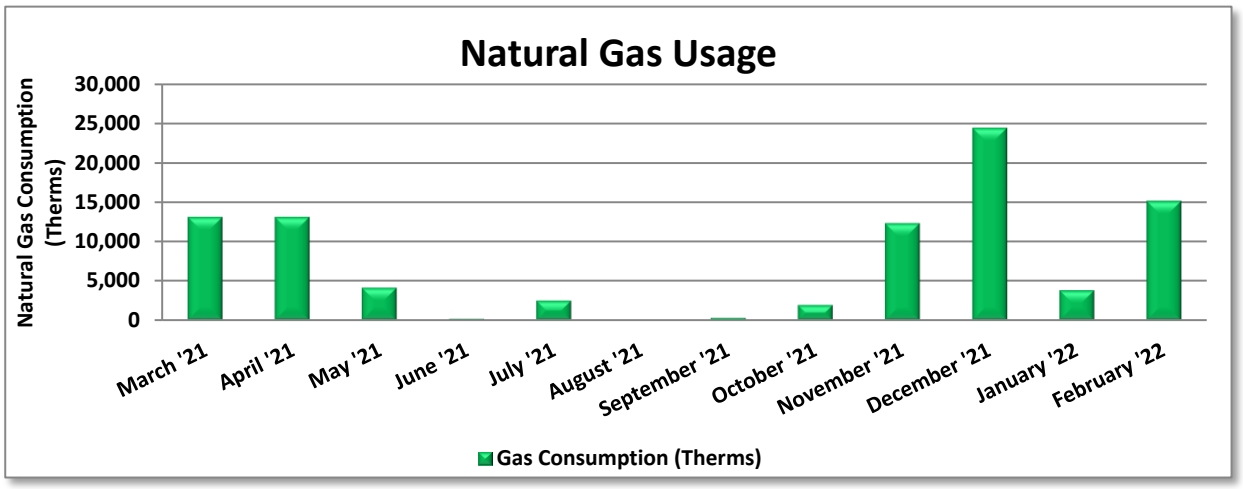
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
3/18/21	30	205,100	384	$4,324	$25,926
4/19/21	32	260,350	465	$5,787	$33,053
5/18/21	29	210,300	372	$3,941	$26,295
6/22/21	35	152,850	387	$5,125	$22,209
7/21/21	29	194,900	375	$4,114	$25,488
8/20/21	30	202,700	360	$3,949	$26,045
9/21/21	32	199,950	345	$4,307	$25,761
10/21/21	30	168,475	360	$4,089	$22,818
11/16/21	26	140,300	423	$4,172	$19,733
12/16/21	30	58,100	435	$4,950	$12,369
1/19/22	34	392,900	366	$4,987	$46,840
2/15/22	27	182,600	357	$4,026	$23,563
Totals	**364**	**2,368,525**	**465**	**$53,771**	**$310,100**
Annual	**365**	**2,375,032**	**465**	**$53,919**	**$310,952**

Notes:

- Peak demand of 465 kW occurred in April '21.
- Average demand over the past 12 months was 386 kW.
- The average electric cost over the past 12 months was $0.131/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.
- Electric usage was estimated by Atlantic City Electric for the December '21 bill, with an actual meter reading in January '22. This explains the lower usage in December and higher usage in January when compared to the rest of the year.
- The first graph shows combined electricity consumption, the second graph shows energy consumed from the grid, and the third graph reflects energy produced by the solar panels and consumed on site.
- The solar meter does not capture kW load and is therefore not displayed on the third graph.

3.2 Natural Gas

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



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
3/18/21	30	13,126	$17,378
4/20/21	33	13,104	$17,352
5/18/21	28	4,137	$5,499
6/18/21	31	186	$285
7/21/21	33	2,485	$3,365
8/20/21	30	0	$50
9/21/21	32	289	$428
10/21/21	30	1,935	$2,650
11/16/21	26	12,324	$16,724
12/16/21	30	24,410	$32,873
1/19/22	34	3,801	$5,157
2/15/22	27	15,138	$20,501
Totals	**364**	**90,933**	**$122,262**
Annual	**365**	**91,183**	**$122,598**

Notes:

- The average gas cost for the past 12 months is $1.345/therm, which is the blended rate used throughout the analysis.
- Natural Gas usage was estimated by South Jersey for the November '21 and December '21 bills, with an actual meter reading in January '22. This explains the higher usage in December and lower usage in January when compared to the rest of the year.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, 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.

Benchmarking Score	35

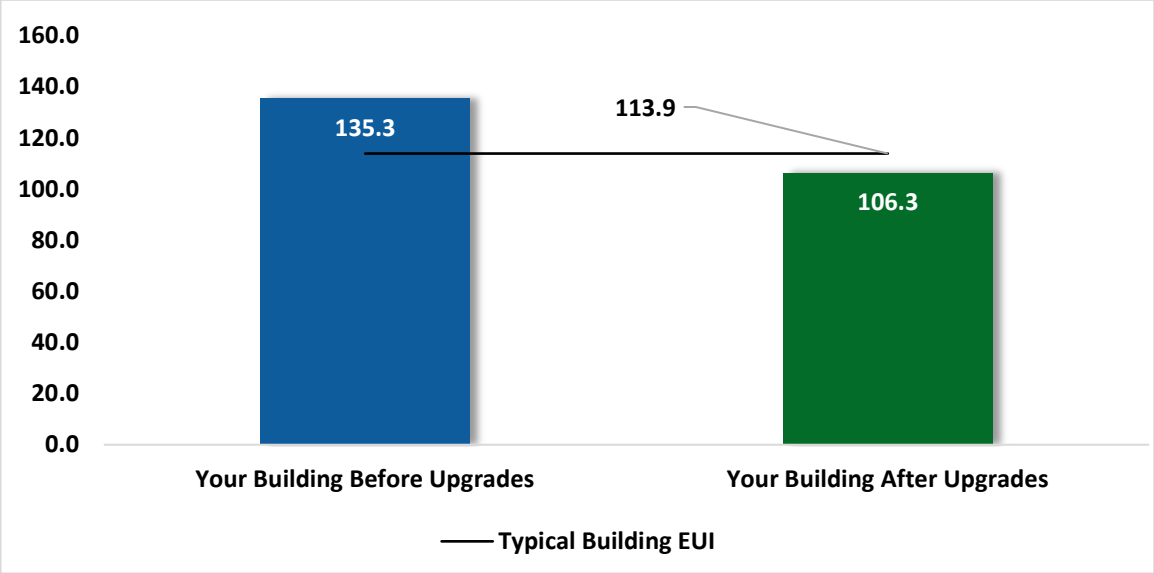


Figure 5 - Energy Use Intensity Comparison[3]

This building performs at, or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

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. Several factors can cause a building to vary from 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.

[3] Based on all evaluated ECMs

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 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.

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements and provide information about the cost effectiveness of those improvements. Most energy conservation measures have received preliminary analysis of feasibility, which identifies expected ranges of savings. 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 in this report are based on the previously run state rebate program SmartStart, which has been retired. Now, all investor-owned gas and electric utility companies are offering complementary energy efficiency programs directly to their customers. Some measures and proposed upgrades may be eligible for higher incentives than those shown below. The incentives in the summary tables should be used for high-level planning purposes. To verify incentives, reach out to your utility provider or visit the NJCEP website for more information.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see Appendix A: Equipment Inventory & Recommendations.

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**297,639**	**65.6**	**-63**	**$38,128**	**$86,604**	**$21,576**	**$65,028**	**1.7**	**292,401**
ECM 1	Install LED Fixtures	Yes	4,128	0.0	0	$540	$1,782	$30	$1,752	3.2	4,157
ECM 2	Retrofit Fixtures with LED Lamps	Yes	293,511	65.6	-63	$37,588	$84,822	$21,546	$63,276	1.7	288,244
Lighting Control Measures			**78,333**	**16.7**	**-17**	**$10,031**	**$85,593**	**$27,920**	**$57,673**	**5.7**	**76,927**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	57,457	12.8	-12	$7,358	$58,368	$7,550	$50,818	6.9	56,426
ECM 4	Install High/Low Lighting Controls	Yes	20,876	3.9	-4	$2,673	$27,225	$20,370	$6,855	2.6	20,501
Motor Upgrades			**1,017**	**0.2**	**0**	**$133**	**$5,924**	**$0**	**$5,924**	**44.5**	**1,024**
ECM 5	Premium Efficiency Motors	No	1,017	0.2	0	$133	$5,924	$0	$5,924	44.5	1,024
Variable Frequency Drive (VFD) Measures			**279,522**	**41.3**	**0**	**$36,597**	**$145,134**	**$18,975**	**$126,159**	**3.4**	**281,476**
ECM 6	Install VFD on Variable Air Volume (VAV) Fans	Yes	36,200	7.5	0	$4,740	$22,224	$3,200	$19,024	4.0	36,453
ECM 7	Install VFDs on Constant Volume (CV) Fans	No	1,579	0.3	0	$207	$3,508	$75	$3,433	16.6	1,590
ECM 8	Install VFDs on Chilled Water Pumps	Yes	179,032	28.7	0	$23,440	$72,961	$9,700	$63,261	2.7	180,284
ECM 9	Install VFDs on Heating Water Pumps	Yes	54,327	5.2	0	$7,113	$31,748	$4,600	$27,148	3.8	54,707
ECM 10	Install VFDs on Cooling Tower Fans	No	8,383	-0.4	0	$1,098	$14,693	$1,400	$13,293	12.1	8,442
Unitary HVAC Measures			**3,000**	**0.8**	**0**	**$393**	**$4,044**	**$0**	**$4,044**	**10.3**	**3,021**
ECM 11	Install High Efficiency Air Conditioning Units	No	3,000	0.8	0	$393	$4,044	$0	$4,044	10.3	3,021
Electric Chiller Replacement			**257,810**	**132.5**	**0**	**$33,754**	**$329,999**	**$10,500**	**$319,499**	**9.5**	**259,613**
ECM 12	Install High Efficiency Chillers	Yes	257,810	132.5	0	$33,754	$329,999	$10,500	$319,499	9.5	259,613
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**532**	**$7,157**	**$140,598**	**$3,481**	**$137,117**	**19.2**	**62,323**
ECM 13	Install High Efficiency Hot Water Boilers	No	0	0.0	532	$7,157	$140,598	$3,481	$137,117	19.2	62,323
HVAC System Improvements			**4,449**	**0.0**	**3**	**$629**	**$744**	**$115**	**$629**	**1.0**	**4,884**
ECM 14	Install Pipe Insulation	Yes	4,449	0.0	3	$629	$744	$115	$629	1.0	4,884
Domestic Water Heating Upgrade			**7,785**	**0.0**	**7**	**$1,115**	**$509**	**$255**	**$255**	**0.2**	**8,673**
ECM 15	Install Low-Flow DHW Devices	Yes	7,785	0.0	7	$1,115	$509	$255	$255	0.2	8,673
Food Service & Refrigeration Measures			**3,909**	**0.4**	**0**	**$512**	**$920**	**$100**	**$820**	**1.6**	**3,936**
ECM 16	Vending Machine Control	Yes	3,909	0.4	0	$512	$920	$100	$820	1.6	3,936
Custom Measures			**12,135**	**0.0**	**0**	**$1,590**	**$6,523**	**$0**	**$6,523**	**4.1**	**12,220**
ECM 17	Replace Electric Water Heater with Heat Pump Water Heater	Yes	12,135	0.0	0	$1,590	$6,523	$0	$6,523	4.1	12,220
TOTALS			**945,599**	**257.5**	**464**	**$130,038**	**$806,593**	**$82,921**	**$723,672**	**5.6**	**1,006,499**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 6 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**297,639**	**65.6**	**-63**	**$38,128**	**$86,604**	**$21,576**	**$65,028**	**1.7**	**292,401**
ECM 1	Install LED Fixtures	4,128	0.0	0	$540	$1,782	$30	$1,752	3.2	4,157
ECM 2	Retrofit Fixtures with LED Lamps	293,511	65.6	-63	$37,588	$84,822	$21,546	$63,276	1.7	288,244
Lighting Control Measures		**78,333**	**16.7**	**-17**	**$10,031**	**$85,593**	**$27,920**	**$57,673**	**5.7**	**76,927**
ECM 3	Install Occupancy Sensor Lighting Controls	57,457	12.8	-12	$7,358	$58,368	$7,550	$50,818	6.9	56,426
ECM 4	Install High/Low Lighting Controls	20,876	3.9	-4	$2,673	$27,225	$20,370	$6,855	2.6	20,501
Variable Frequency Drive (VFD) Measures		**269,560**	**41.4**	**0**	**$35,292**	**$126,933**	**$17,500**	**$109,433**	**3.1**	**271,444**
ECM 6	Install VFD on Variable Air Volume (VAV) Fans	36,200	7.5	0	$4,740	$22,224	$3,200	$19,024	4.0	36,453
ECM 8	Install VFDs on Chilled Water Pumps	179,032	28.7	0	$23,440	$72,961	$9,700	$63,261	2.7	180,284
ECM 9	Install VFDs on Heating Water Pumps	54,327	5.2	0	$7,113	$31,748	$4,600	$27,148	3.8	54,707
Electric Chiller Replacement		**257,810**	**132.5**	**0**	**$33,754**	**$329,999**	**$10,500**	**$319,499**	**9.5**	**259,613**
ECM 12	Install High Efficiency Chillers	257,810	132.5	0	$33,754	$329,999	$10,500	$319,499	9.5	259,613
HVAC System Improvements		**4,449**	**0.0**	**3**	**$629**	**$744**	**$115**	**$629**	**1.0**	**4,884**
ECM 14	Install Pipe Insulation	4,449	0.0	3	$629	$744	$115	$629	1.0	4,884
Domestic Water Heating Upgrade		**7,785**	**0.0**	**7**	**$1,115**	**$509**	**$255**	**$255**	**0.2**	**8,673**
ECM 15	Install Low-Flow DHW Devices	7,785	0.0	7	$1,115	$509	$255	$255	0.2	8,673
Food Service & Refrigeration Measures		**3,909**	**0.4**	**0**	**$512**	**$920**	**$100**	**$820**	**1.6**	**3,936**
ECM 16	Vending Machine Control	3,909	0.4	0	$512	$920	$100	$820	1.6	3,936
Custom Measures		**12,135**	**0.0**	**0**	**$1,590**	**$6,523**	**$0**	**$6,523**	**4.1**	**12,220**
ECM 17	Replace Electric Water Heater with Heat Pump Water Heater	12,135	0.0	0	$1,590	$6,523	$0	$6,523	4.1	12,220
TOTALS		**931,619**	**256.6**	**-69**	**$121,051**	**$637,826**	**$77,966**	**$559,860**	**4.6**	**930,099**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 7 – 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 ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**297,639**	**65.6**	**-63**	**$38,128**	**$86,604**	**$21,576**	**$65,028**	**1.7**	**292,401**
ECM 1	Install LED Fixtures	4,128	0.0	0	$540	$1,782	$30	$1,752	3.2	4,157
ECM 2	Retrofit Fixtures with LED Lamps	293,511	65.6	-63	$37,588	$84,822	$21,546	$63,276	1.7	288,244

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 is 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 existing fixtures containing high-intensity discharge (HID) 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.

In some cases, HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixtures.

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 MH fixtures

ECM 2: Retrofit Fixtures with LED Lamps

Replace fluorescent, CFL, and incandescent 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. Be sure to specify replacement lamps that are compatible with existing dimming controls, where applicable. In some circumstances, you may need to upgrade your dimming system for optimum performance.

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; CFL, and incandescent lamps

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**78,333**	**16.7**	**-17**	**$10,031**	**$85,593**	**$27,920**	**$57,673**	**5.7**	**76,927**
ECM 3	Install Occupancy Sensor Lighting Controls	57,457	12.8	-12	$7,358	$58,368	$7,550	$50,818	6.9	56,426
ECM 4	Install High/Low Lighting Controls	20,876	3.9	-4	$2,673	$27,225	$20,370	$6,855	2.6	20,501

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 3: 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 that 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: offices, conference rooms, lounges, court rooms, libraries, dining areas, restrooms, locker rooms, garages, and storage rooms

ECM 4: Install High/Low Lighting Controls

Install occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety code requirements for egress. 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.

The controller lowers the light level by dimming the fixture output. Therefore, the controlled fixtures need to have a dimmable ballast or driver. This will need to be considered when selecting retrofit lamps and bulbs for the areas proposed for high/low control.

For this type of measure the occupancy sensors will generally be ceiling or fixture mounted. Sufficient sensor coverage must be provided to ensure that lights turn on in each area as occupants approach the area.

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

Affected Building Areas: hallways, stairwells, lobbies, and atriums

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**1,017**	**0.2**	**0**	**$133**	**$5,924**	**$0**	**$5,924**	**44.5**	**1,024**
ECM 5	Premium Efficiency Motors	1,017	0.2	0	$133	$5,924	$0	$5,924	44.5	1,024

ECM 5: Premium Efficiency Motors

We evaluated replacing standard efficiency motors with IHP 2014 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
Mechanical - Penthouse	Boiler #1	1	Combustion Air Fan	5.0	Boiler #1
Mechanical - Penthouse	Boiler #2	1	Combustion Air Fan	2.0	Boiler #2
Mechanical - Penthouse	Heating System	2	Heating Hot Water Pump	0.5	BP-1 & BP-2
Mechanical - Penthouse #2	Heating System	2	Heating Hot Water Pump	0.5	HWP-6 & HWP-7
Roof	Exhaust System	1	Exhaust Fan	0.3	Exhaust Fan
Roof	Exhaust System	3	Exhaust Fan	0.5	Exhaust Fan

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*.

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 ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**279,522**	**41.3**	**0**	**$36,597**	**$145,134**	**$18,975**	**$126,159**	**3.4**	**281,476**
ECM 6	Install VFD on Variable Air Volume (VAV) Fans	36,200	7.5	0	$4,740	$22,224	$3,200	$19,024	4.0	36,453
ECM 7	Install VFDs on Constant Volume (CV) Fans	1,579	0.3	0	$207	$3,508	$75	$3,433	16.6	1,590
ECM 8	Install VFDs on Chilled Water Pumps	179,032	28.7	0	$23,440	$72,961	$9,700	$63,261	2.7	180,284
ECM 9	Install VFDs on Heating Water Pumps	54,327	5.2	0	$7,113	$31,748	$4,600	$27,148	3.8	54,707
ECM 10	Install VFDs on Cooling Tower Fans	8,383	-0.4	0	$1,098	$14,693	$1,400	$13,293	12.1	8,442

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 inverter duty rated motor to conservatively account for the cost of an inverter duty rated motor.

ECM 6: Install VFD on Variable Air Volume (VAV) Fans

Replace existing air volume control devices on variable volume fans, such as inlet vanes and variable pitch fan blades, with VFDs. Inlet guide vanes and variable pitch fan blades are an inefficient means of controlling the air volume compared to VFDs. The existing volume control device will be removed or permanently disabled, and the control signal will be redirected to the VFD to determine proper fan motor speed.

Energy savings result from using a more efficient control device to regulate the air flow provided by the fan. Additional maintenance savings may result from this measure. VFDs are solid state electronic devices, which generally require less maintenance than mechanical air volume control devices.

Affected Air Handlers: AHUs 2A, 2B, 3A, and 3B

ECM 7: Install VFDs on Constant Volume (CV) Fans

We evaluated installing VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected Motors: larger exhaust fans

ECM 8: 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.

Affected Pumps: CWPs 1-3 and CHWPs 4-5

ECM 9: Install VFDs on Heating Water Pumps

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

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

Affected Pumps: HWPs 1-4

ECM 10: Install VFDs on Cooling Tower Fans

We evaluated installing a VFD to control the cooling tower fan motor. The VFD will allow the cooling tower fan to operate at the minimum speed necessary to maintain the temperature of the condenser water returning to the chiller.

Energy savings result from reducing fan speed (and power) when there is a reduced load on the chiller and outside air wet bulb temperatures are depressed. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

4.5 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**3,000**	**0.8**	**0**	**$393**	**$4,044**	**$0**	**$4,044**	**10.3**	**3,021**
ECM 11	Install High Efficiency Air Conditioning Units	3,000	0.8	0	$393	$4,044	$0	$4,044	10.3	3,021

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high efficiency unit can be justified by the marginal savings from the improved efficiency. When the mini-split AC unit is eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 11: Install High Efficiency Air Conditioning Units

We evaluated replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling and heating load, and the estimated annual operating hours.

Affected Units: mini-split AC unit serving electrical room 115W

4.6 Electric Chillers

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Chiller Replacement		**257,810**	**132.5**	**0**	**$33,754**	**$329,999**	**$10,500**	**$319,499**	**9.5**	**259,613**
ECM 12	Install High Efficiency Chillers	257,810	132.5	0	$33,754	$329,999	$10,500	$319,499	9.5	259,613

ECM 12: Install High Efficiency Chillers

Replace older inefficient electric chillers with new high efficiency chillers. The type of chiller to be installed depends on the magnitude of the cooling load and variability of the cooling load profile, for example:

- Positive displacement chillers are usually under 600 tons of cooling capacity, and centrifugal chillers generally start at 150 tons of cooling capacity.
- Constant speed chillers should be used to meet cooling loads with little or no variation, while variable speed chillers are more efficient for variable cooling load profiles.
- Water cooled chillers are more efficient than air cooled chillers but require cooling towers and additional pumps to circulate the cooling water.
- In any given size range, variable speed chillers tend to have better partial load efficiency, but worse full load efficiency, than constant speed chillers.

Energy savings result from the improvement in chiller efficiency and matching the right type of chiller to the cooling load. The energy savings are calculated based on the cooling capacity of the new chiller, the improvement in efficiency compared with the base case equipment, the cooling load profile, and the estimated annual operating hours of the chiller before and after the upgrade.

For the purposes of this analysis, we evaluated the replacement of chillers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your design team to select chillers that are sized appropriately for the cooling load. In some cases, the plant energy use can be reduced by selecting multiple chillers that match the facility load profile, rather than one or two large chillers. This can also improve the chiller plant reliability through increased redundancy. Energy savings are maximized by proper selection of new equipment based on the cooling load profile.

Replacing the chillers has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the chillers have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high-efficiency chiller can be justified by the marginal savings from the improved efficiency. When the chillers are eventually replaced, consider purchasing equipment that exceed the minimum efficiency required by building codes.

4.7 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**532**	**$7,157**	**$140,598**	**$3,481**	**$137,117**	**19.2**	**62,323**
ECM 13	Install High Efficiency Hot Water Boilers	0	0.0	532	$7,157	$140,598	$3,481	$137,117	19.2	62,323

ECM 13: Install High Efficiency Hot Water Boilers

We evaluated replacing older inefficient hot water boilers with high efficiency hot water boilers. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

For the purposes of this analysis, we evaluated the replacement of boilers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your mechanical design team to select boilers that are sized appropriately for the heating load. In many cases installing multiple modular boilers, rather than one or two large boilers, will result in higher overall plant efficiency while providing additional system redundancy.

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.

4.8 HVAC Improvements

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**4,449**	**0.0**	**3**	**$629**	**$744**	**$115**	**$629**	**1.0**	**4,884**
ECM 14	Install Pipe Insulation	4,449	0.0	3	$629	$744	$115	$629	1.0	4,884

ECM 14: Install Pipe Insulation

Install insulation on domestic hot water system piping. Distribution system losses are dependent on system fluid temperature, the size of the distribution system, and the level of insulation of the piping. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is exposed to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

Affected Systems: domestic hot water piping

4.9 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**7,785**	**0.0**	**7**	**$1,115**	**$509**	**$255**	**$255**	**0.2**	**8,673**
ECM 15	Install Low-Flow DHW Devices	7,785	0.0	7	$1,115	$509	$255	$255	0.2	8,673

ECM 15: 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.

4.10 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**3,909**	**0.4**	**0**	**$512**	**$920**	**$100**	**$820**	**1.6**	**3,936**
ECM 16	Vending Machine Control	3,909	0.4	0	$512	$920	$100	$820	1.6	3,936

ECM 16: 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.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Custom Measures		**12,135**	**0.0**	**0**	**$1,590**	**$6,523**	**$0**	**$6,523**	**4.1**	**12,220**
ECM 17	Replace Electric Water Heater with Heat Pump Water Heater	12,135	0.0	0	$1,590	$6,523	$0	$6,523	4.1	12,220

ECM 17: Replace Electric Water Heater with Heat Pump Water Heater

A typical electric water heater uses electric resistance coils to heat water at a coefficient of performance (COP) of 1. Air source heat pump water heaters (HPWH) use a refrigeration cycle to transfer heat from the surrounding air to the domestic water. The typical average COP for a HPWH is about 2.5, so they require significantly less electricity to produce the same amount of hot water as a traditional electric water heater. There are two types of HPWH, those integrated with the heat pump and storage tank in the same unit, and those that are split into two sections (with the storage tank separate from the heat pump). The following addresses integrated HPWH.

HPWH reject cold air. As such, they need to be installed in an unconditioned space of about 750 cubic feet with good ventilation. Ideal locations are garages, large enclosed, unconditioned storage areas, or areas with excess heat such as a furnace or boiler room.[4] The HPWH will also produce condensate so accommodations for draining the condensate need to be provided.

Most HPWH operate effectively down to an air temperature of 40 °F. Below that temperature, an electric resistance booster heater is typically required to achieve full heating capacity. It is critical that the HPWH controls are set up so that the electric resistance heat only engages when the air temperature is too cold for the HPWH to extract heat from it. HPWHs have a slow recovery. During periods of high demand, the electric resistance heating element, if enabled, may be energized to maintain set point, thus reducing the overall efficiency of the unit. It is recommended that a careful analysis of the hot water demand be conducted to determine if the application makes economic sense, and the HPWH heating capacity and storage are properly sized.

HPWH operate most effectively when the temperature difference between the incoming and outgoing water is high. Generally, this means that cold make-up water should be piped to the bottom of the tank and return water should be piped to the top of the tank in order to maintain stratification within the storage tank. Water should be drawn from the bottom of the tank to be heated. If there is a DHW recirculation pump, it should only be operated during high hot water demand periods.

[4] https://basc.pnnl.gov/code-compliance/heat-pump-water-heaters-code-compliance-brief#:~:text=HPWH%20must%20have%20unrestricted%20airflow,depending%20on%20size%20of%20system

4.12 Measures for Future Consideration

There are additional opportunities for improvement that Atlantic County may wish to consider. These potential upgrades typically require further analysis, involve substantial capital investment, and/or include significant system reconfiguration. These measures are therefore beyond the scope of this energy audit. These measures are described here to support a whole building approach to energy efficiency and sustainability.

Atlantic County may wish to consider the Energy Savings Improvement Program (ESIP) or other whole building approach. With interest in implementing comprehensive, largescale and/or complex system wide projects, these measures may be pursued during development of a future energy savings plan. We recommend that you work with your energy service company (ESCO) and/or design team to:

- Evaluate these measures further.
- Develop firm costs.
- Determine measure savings.
- Prepare detailed implementation plans.

Other modernization or capital improvement funds may be leveraged for these types of refurbishments. As you plan for capital upgrades, be sure to consider the energy impact of the building systems and controls being specified.

Retro-Commissioning Study

Due to the complexity of today's HVAC systems and controls, a thorough analysis and rebalance of heating, ventilation, and cooling systems should periodically be conducted. There are indications at this site that systems may not be operating correctly or as efficiently as they could be. One important tool available to building operators to ensure proper system operation is retro-commissioning.

Retro-commissioning is a common practice recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to be implemented every few years. We recommend that you contact a reputable engineering firm that specializes in energy control systems and retro-commissioning. Ask them to propose a scope of work and an outline of the procedures and processes to be implemented, including a schedule and the roles of all responsible parties.

Once goals and responsibilities are established, the objective of the investigation process is to understand how the building is currently operating, identify the issues, and determine the most cost-effective way to improve performance. The retro-commissioning agent will review building documentation, interview building occupants, and inspect and test the equipment. Information is then compiled into a report and shared with facility staff, who will select which recommendations to implement after reviewing the findings.

The implementation phase puts the selected processes into place. Typical measures may include sensor calibration, equipment schedule changes, damper linkage repair and similar relatively low-cost adjustments—although more expensive sophisticated programming and building control system upgrades may be warranted. Approved measures may be implemented by the agent, the building staff, or by subcontractors. Typically, a combination of these individuals makes up the retro-commissioning team.

After the approved measures are implemented, the team will verify that the changes are working as expected. Baseline and post-case measurements will allow building staff to monitor equipment and ensure that the benefits are maintained.

Window Replacements

Energy efficient windows are an important consideration when improving the building envelope. The heat transfer through the glass panes is responsible for a significant portion of the facility's heating and cooling energy consumption. We recommend replacing single-pane windows with double-pane windows, and we recommend models that are gas-filled with low-e coatings to reduce heat loss. Windows should be selected with low U-factors to maximize energy savings. The U-factor is the rate at which the window conducts non-solar heat flow and is a key indicator of performance. The lower the U-factor, the higher the efficiency of the window. Window frames and sashes should be efficient as well. If metal frames are specified or required by code, the frame extrusions should have a thermal break to reduce conduction through the frame. As part of the installation, the window frames should be properly sealed with caulk materials to ensure the mitigation of air infiltration. Building envelopes that limit air infiltration and that have adequate fenestrations play a key role in optimizing heating and cooling efficiency, controlling moisture, and providing occupant comfort. Window system replacement is an expensive upgrade that generally involves architectural elements. We recommend this as a measure for further study.

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.

Operation and maintenance (O&M) plans enhance the operational efficiency of HVAC and other energy intensive systems and could save 5% –20% of the energy usage in your building without substantial capital investment. A successful plan includes your records of energy usage trends and costs, building equipment lists, current maintenance practices, and planned capital upgrades, and it incorporates your ideas for improved building operation. Your plan will address goals for energy-efficient operation, provide detail on how to reach the goals, and outline procedures for measuring and reporting whether goals have been achieved.

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 cannot manage what you do not 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[5]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Weatherization

Caulk or weather strip leaky doors and windows to reduce drafts and loss of heated or cooled air. Sealing cracks and openings can reduce heating and cooling costs, improve building durability, and create a healthier indoor environment. Materials used may include caulk, polyurethane foam, and other weather-stripping materials. There is an energy savings opportunity by reducing the uncontrolled air exchange between the outside and inside of the building. Blower door assisted comprehensive building air sealing will reduce the amount of air exchange, which will in turn reduce the load on the buildings heating and cooling equipment, providing energy savings and increased occupant comfort.

Doors and Windows

Close exterior doors and windows in heated and cooled areas. Leaving doors and windows open leads to a loss of heat during the winter and chilled air during the summer. Reducing air changes per hour can lead to increased occupant comfort as well as heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

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

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.

Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly. Adjust exterior lighting time clock controls seasonally as needed to match your lighting requirements.

Motor Maintenance

Motors have many moving parts. As these parts degrade over time, the efficiency of the motor is reduced. Routine maintenance prevents damage to motor components. Routine maintenance should include cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Fans to Reduce Cooling Load

Install ceiling fans to supplement your cooling system. Thermostat settings can typically be increased by 4°F with no change in overall occupant comfort due to the wind chill effect of moving air.

Thermostat Schedules and Temperature Resets

Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5°F-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

Economizer Maintenance

Economizers can significantly reduce cooling system load. A malfunctioning economizer can increase the amount of heating and mechanical cooling required by introducing excess amounts of cold or hot outside air. Common economizer malfunctions include broken outdoor thermostat or enthalpy control or dampers that are stuck or improperly adjusted.

Periodic inspection and maintenance will keep economizers working in sync with the heating and cooling system. This maintenance should be part of annual system maintenance, and it should include proper setting of the outdoor thermostat/enthalpy control, inspection of control and damper operation, lubrication of damper connections, and adjustment of minimum damper position.

Chiller Maintenance

Service chillers regularly to keep them operating properly. Chillers are responsible for a substantial portion of a commercial building's overall energy usage, and when they do not work well, there is usually a noticeable increase in energy bills and increased occupant complaints. Regular diagnostics and service can save five to ten percent of the cost of operating your chiller. If you already have a maintenance contract in place, your existing service company should be able to provide these services.

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.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

Ductwork Maintenance

Duct maintenance has two primary goals: keep the ducts clean to avoid air quality problems and seal leaks to save energy. Check for cleanliness, obstructions that block airflow, water damage, and leaks. Ducts should be inspected at least every two years.

The biggest symptoms of clogged air ducts are differing temperatures throughout the building and areas with limited airflow from supply registers. If a particular air duct is clogged, then air flow will only be cut off to some rooms in the building—not all of them. The reduced airflow will make it more difficult for those areas to reach the temperature setpoint, which will cause the HVAC system to run longer to cool or heat that area properly. If you suspect clogged air ducts, ensure that all areas in front of supply registers are clear of items that may block or restrict air flow, and you should check for fire dampers or balancing dampers that have failed closed.

Duct leakage in commercial buildings can account for 5%–25% of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building wasting conditioned air. Check ductwork for leakage. Eliminating duct leaks can improve ventilation system performance and reduce heating and cooling system operation.

Distribution system losses are dependent on air system temperature, the size of the distribution system, and the level of insulation of the ductwork. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is missing or worn, the system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

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 and efficiently. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the boiler tubes to improve heat transfer.

Label HVAC Equipment

For improved coordination in maintenance practices, we recommend labeling or re-labeling the site HVAC equipment. Maintain continuity in labeling by following labeling conventions as indicated in the facility drawings or BAS building equipment list. Use weatherproof or heatproof labeling or stickers for permanence, but do not cover over original equipment nameplates, which should be kept clean and readable whenever possible. Besides equipment, label piping for service and direction of flow when possible. Ideally, maintain a log of HVAC equipment, including nameplate information, asset tag designation, areas served, installation year, service dates, and other pertinent information.

This investment in your equipment will enhance collaboration and communication between your staff and your contracted service providers and may help you with regulatory compliance.

Optimize HVAC Equipment Schedules

Energy management systems (BAS) typically provide advanced controls for building HVAC systems, including chillers, boilers, air handling units, rooftop units and exhaust fans. The BAS monitors and reports operational status, schedules equipment start and stop times, locks out equipment operation based on outside air or space temperature, and often optimizes damper and valve operation based on complex algorithms. These BAS features, when in proper adjustment, can improve comfort for building occupants and save substantial energy.

Know your BAS scheduling capabilities. Regularly monitor HVAC equipment operating schedules and match them to building operating hours in order to eliminate unnecessary equipment operation and save energy. Monitoring should be performed often at sites with frequently changing usage patterns – daily in some cases. We recommend using the *optimal start* feature of the BAS (if available) to optimize the building warmup sequence. Most BAS scheduling programs provide for holiday schedules, which can be used during reduced use or shutdown periods. Finally, many systems are equipped with a one-time override function, which can be used to provide additional space conditioning due to a one-time, special event. When available this override feature should be used rather than changing the base operating schedule.

Water Heater Maintenance

The lower the supply water temperature that is used for hand washing sinks, the less energy is needed to heat the water. Reducing the temperature results in energy savings and the change is often unnoticeable to users. Be sure to review the domestic water temperature requirements for sterilizers and dishwashers as you investigate reducing the supply water temperature.

Also, preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Refrigeration Equipment Maintenance

Preventative maintenance keeps commercial refrigeration equipment running reliably and efficiently. Commercial refrigerators and freezers are mission-critical equipment that can cost a fortune when they go down. Even when they appear to be working properly, refrigeration units can be consuming too much energy. Have walk-in refrigeration and freezer and other commercial systems serviced at least annually. This practice will allow systems to perform to their highest capabilities and will help identify system issues if they exist.

Maintaining your commercial refrigeration equipment can save between five and ten percent on energy costs. When condenser coils are dirty, your commercial refrigerators and freezers work harder to maintain the temperature inside. Worn gaskets, hinges, door handles or faulty seals cause cold air to leak from the unit, forcing the unit to run longer and use more electricity.

Regular cleaning and maintenance also help your commercial refrigeration equipment to last longer.

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[6] or download a copy of EPA's "WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities"[7] 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

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

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

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.

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, 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.

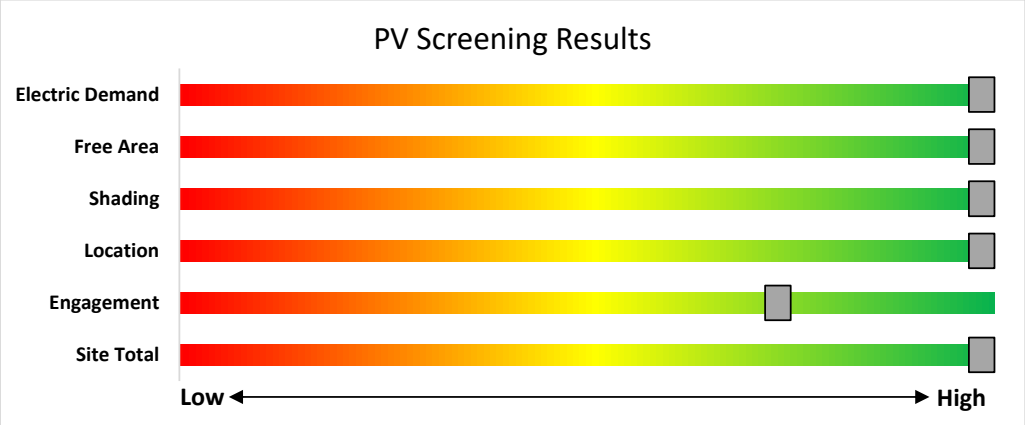
6.1 Solar Photovoltaic

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 high potential for installing an additional PV array.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high potential. An additional PV array located on the roof may be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

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.



Potential	High	
System Potential	107	kW DC STC
Electric Generation	127,477	kWh/yr
Displaced Cost	$16,690	/yr
Installed Cost	$278,200	

Figure 8 - Photovoltaic Screening

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available for solar projects. Solar projects may qualify to earn SREC- IIs (Solar Renewable Energy Certificates-II), however, the project owners *must* register their solar projects prior to the start of construction to establish the project's eligibility.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

Successor Solar Incentive Program (SuSI): https://www.njcleanenergy.com/renewable-energy/programs/susi-program

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

6.2 Combined Heat and Power

Combined heat and power (CHP) 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 lack of gas service, low or 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.

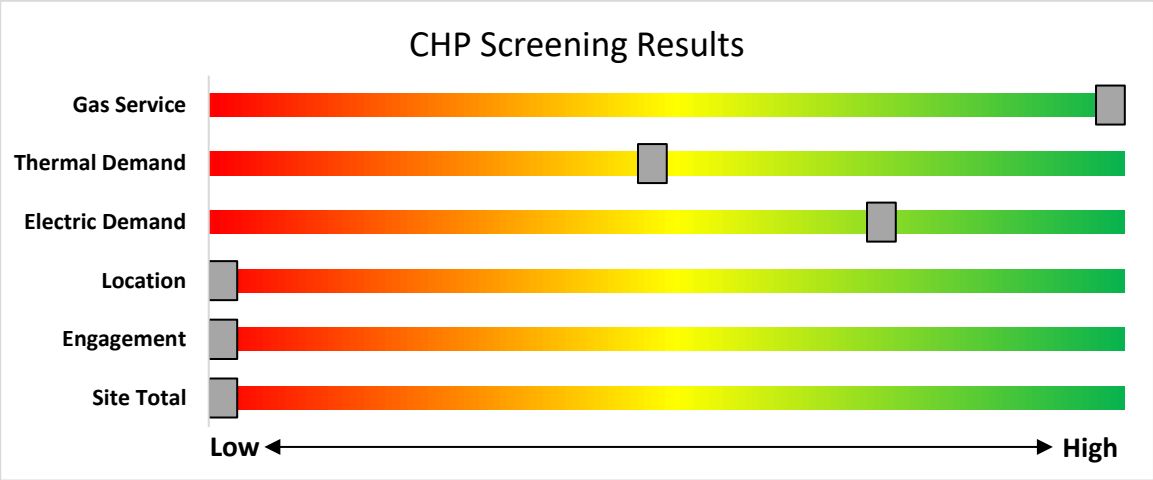


Figure 9 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

7 ELECTRIC VEHICLES (EV)

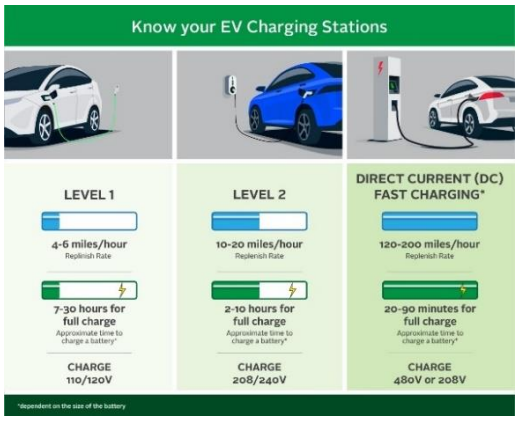
All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes all-electric vehicles as zero-emission vehicles because they produce no direct exhaust or tailpipe emissions.

EVs are typically more expensive than similar conventional and hybrid vehicles, although some cost can be recovered through fuel savings, federal tax credit, or state incentives.

7.1 Electric Vehicle Charging

EV charging stations provide a means for electric vehicle operators to recharge their batteries at a facility. While many EV drivers charge at home, others do not have access to regular home charging, and the ability to charge at work or in public locations is critical to making EVs practical for more drivers. Charging can also be used for electric fleet vehicles, which can reduce fuel and maintenance costs for fleets that replace gas or diesel vehicles with EVs.

EV charging comes in three main types. For this assessment, the screening considers addition of Level 2 charging, which is most common at workplaces and other public locations. Depending on the site type and usage, other levels of charging power may be more appropriate.



The preliminary assessment of EV charging at the facility shows that there is high potential for adding EV chargers to the facility's parking, based on potential costs of installation and other site factors.

The primary costs associated with installing EV charging are the charger hardware and the cost to extend power from the facility to parking spaces. This may include upgrades to electric panels to serve increased loads.

The type and size of the parking area impact the costs and feasibility of adding EV charging. Parking structure installations can be less costly than surface lot installations as power may be readily available, and equipment and wiring can be surface mounted. Parking lot installations often require trenching through concrete or asphalt surface. Large parking areas provide greater flexibility in charger siting than smaller lots.

The location and capacity of facility electric panels also impact charger installation costs. A Level 2 charger generally requires a dedicated 208-240V, 40 Amp circuit. The electric panel nearest the planned installation may not have available capacity and may need to be upgraded to serve new EV charging loads. Alternatively, chargers could be powered from a more distant panel. The distance from the panel to the location of charging stations ties directly to costs, as conduits, cables, and potential trenching costs all increase on a per-foot basis. The more charging stations planned, the more likely it is that additional electrical capacity will be needed.

Other factors to consider when planning for EV charging at a facility include who the intended users are, how long they park vehicles at the site, and whether they will need to pay for the electricity they use.

The graphic below displays the results of the EV charging assessment conducted as part of this audit. The position of each slider indicates the impact each factor has on the feasibility of installing EV charging at the site.

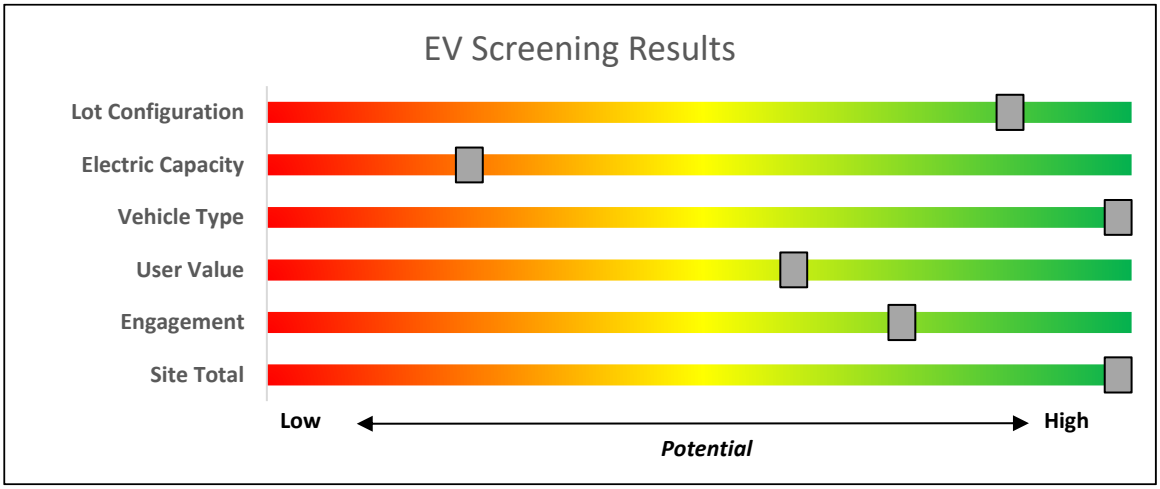


Figure 10 – EV Charger Screening

Electric Vehicle Programs Available

New Jersey is leading the way on electric vehicle (EV) adoption on the East Coast. There are several programs designed to encourage EV adoption in New Jersey, which is crucial to reaching a 100% clean energy future.

NJCEP offers a variety of EV programs for vehicles, charging stations, and fleets. Certain EV charging stations that receive electric utility service from Atlantic City Electric Company (ACE) or Public Service Electric & Gas Company (PSE&G), may be eligible for additional electric vehicle charging incentives directly from the utility. Projects may be eligible for both the incentives offered by this BPU program and incentives offered by ACE or PSE&G, up to 90% of the combined charger purchase and installation costs. Please check ACE or PSE&G program eligibility requirements before purchasing EV charging equipment, as additional conditions on types of eligible chargers may apply for utility incentives.

Both Jersey Central Power & Light (JCP&L) and Rockland Electric (RECO) have filed proposals for EV charging programs. BPU staff is currently reviewing those proposals.

For more information and to keep up to date on all EV programs please visit https://www.njcleanenergy.com/commercial-industrial/programs/electric-vehicle-programs.

8 Project Funding and Incentives

Ready to improve your building's performance? New Jersey's Clean Energy Programs and Utility Energy Efficiency Programs can help. Pick the program that works best for you. This section provides an overview of currently available incentive programs in.

8.1 Utility Energy Efficiency Programs

The Clean Energy Act, signed into law by Governor Murphy in 2018, requires New Jersey's investor-owned gas and electric utilities to reduce their customers' use by set percentages over time. To help reach these targets the New Jersey Board of Public Utilities approved a comprehensive suite of energy efficiency programs to be run by the utility companies.

Prescriptive and Custom

The Prescriptive and Custom rebate program through your utility provider 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.

Equipment Examples

Lighting
Lighting Controls
HVAC Equipment
Refrigeration
Gas Heating
Gas Cooling
Commercial Kitchen Equipment
Food Service Equipment
Variable Frequency Drives
Electronically Commutate Motors
Variable Frequency Drives
Plug Loads Controls
Washers and Dryers
Agricultural
Water Heating

The Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type. The Custom program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives.

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 or less 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.

How to Participate

To participate in Direct Install, you will work with a participating contractor. 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 Direct Install program, subject to program rules and eligibility, while the remaining percent of the cost is paid to the contractor by the customer.

Engineered Solutions

The Engineered Solutions Program provides tailored energy-efficiency assistance and services to municipalities, universities, schools, hospitals and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. Customers receive expert guided services, including investment-grade energy auditing, engineering design, installation assistance, construction administration, commissioning, and measurement and verification (M&V) services to support the implementation of cost-effective and comprehensive efficiency projects. Engineered Solutions is generally a good option for medium to large sized facilities with a peak demand over 200 kW looking to implement as many measures as possible under a single project to achieve deep energy savings. Engineered Solutions has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program. Incentives for this program are based on project scope and energy savings achieved.

For more information on any of these programs, contact your local utility provider or visit https://www.njcleanenergy.com/transition.

8.2 New Jersey's Clean Energy Programs

Save money while saving the planet! New Jersey's Clean Energy Program is a statewide program that offers incentives, programs, and services that benefit New Jersey residents, businesses, educational, non-profit, and government entities to help them save energy, money, and the environment.

Large Energy Users

The Large Energy Users Program (LEUP) is designed to foster self-directed investment in energy projects. This program is offered to New Jersey's largest energy customers that annually contribute at least $200,000 to the NJCEP aggregate of all buildings/sites. This equates to roughly $5 million in energy costs in the prior fiscal year.

Incentives

Incentives are based on the specifications below. The maximum incentive per entity is the lesser of:

- $4 million
- 75% of the total project(s) cost
- 90% of total NJCEP fund contribution in previous year
- $0.33 per projected kWh saved; $3.75 per projected Therm saved annually

How to Participate

To participate in LEUP, you will first need submit an enrollment application. This program requires all qualified and approved applicants to submit an energy plan that outlines the proposed energy efficiency work for review and approval. Applicants may submit a Draft Energy Efficiency Plan (DEEP), or a Final Energy Efficiency Plan (FEEP). Once the FEEP is approved, the proposed work can begin.

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

Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine Fuel Cells with Heat Recovery	>3 MW	$350		
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You will work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at www.njcleanenergy.com/CHP.

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The program is used to register and certify solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SREC-IIs (Solar Renewable Energy Certificates-II). SuSI consists of two sub-programs. The Administratively Determined Incentive (ADI) Program and the Competitive Solar Incentive (CSI) Program.

Administratively Determined Incentive (ADI) Program

The ADI Program provides administratively set incentives for net metered residential projects, net metered non-residential projects 5 MW or less, and all community solar projects.

After the registration is accepted, construction is complete, and a complete final as-built packet has been submitted, the project is issued a New Jersey certification number, which enables it to generate New Jersey SREC- IIs.

Market Segments	Size MW dc	Incentive Value ($/SREC II)	Public Entities Incentive Value - $20 Adder ($/SRECII)
Net Metered Residential	All types and sizes	$90	N/A
Small Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects smaller than 1 MW	$100	$120
Large Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects 1 MW to 5 MW	$90	$110
Small Net Metered Non-Residential Ground Mount	Projects smaller than 1 MW	$85	$105
Large Net Metered Non-Residential Ground Mount	Projects 1 MW to 5 MW	$80	$100
LMI Community Solar	Up to 5 MW	$90	N/A
Non-LMI Community Solar	Up to 5 MW	$70	N/A
Interim Subsection (t)	All types and sizes	$100	N/A

Eligible projects may generate SREC-IIs for 15 years following the commencement of commercial operations which is defined as permission to operate (PTO) from the Electric Distribution Company. After 15 years, projects may be eligible for a NJ Class I REC.

SREC-IIs will be purchased monthly by the SREC-II Program Administrator who will allocate the SREC-IIs to the Load Serving Entities (BGS Providers and Third-Party Suppliers) annually based on their market share of retail electricity sold during the relevant Energy Year.

The ADI Program online portal is now open to new registrations.

Competitive Solar Incentive Program

The Competitive Solar Incentive (CSI) Program will provide competitively set incentives for grid supply projects and net metered non-residential projects greater than 5MW (dc). The program is currently under development. For updates, please continue to check the Solar Proceedings page on the New Jersey's Clean Energy Program website.

Solar projects help the State of New Jersey reach renewable energy goals outlined in the state's Energy Master Plan.

If you are considering installing solar photovoltaics on your building, visit the following link for more information: https://njcleanenergy.com/renewable-energy/programs/susi-program.

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 into contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the energy conservation measures (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 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 descriptions 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.

9 PROJECT DEVELOPMENT

Energy conservation measures (ECMs) have been identified for your site, and their energy and economic analyses are provided within this LGEA report. Note that some of the identified projects may be mutually exclusive, such as replacing equipment versus upgrading motors or controls. The next steps with project development are to set goals and create a comprehensive project plan. The graphic below provides an overview of the process flow for a typical energy efficiency or renewable energy project. We recommend implementing as many ECMs as possible prior to undertaking a feasibility study for a renewable project. The cyclical nature of this process flow demonstrates the ongoing work required to continually improve building energy efficiency over time. If your building(s) scope of work is relatively simple to implement or small in scope, the measurement and verification (M&V) step may not be required. It should be noted through a typical project cycle, there will be changes in costs based on specific scopes of work, contractor selections, design considerations, construction, etc. The estimated costs provided throughout this LGEA report demonstrate the unburdened turn-key material and labor cost only. There will be contingencies and additional costs at the time of implementation. We recommend comprehensive project planning that includes the review of multiple bids for project work, incorporates potential operations and maintenance (O&M) cost savings, and maximizes your incentive potential.

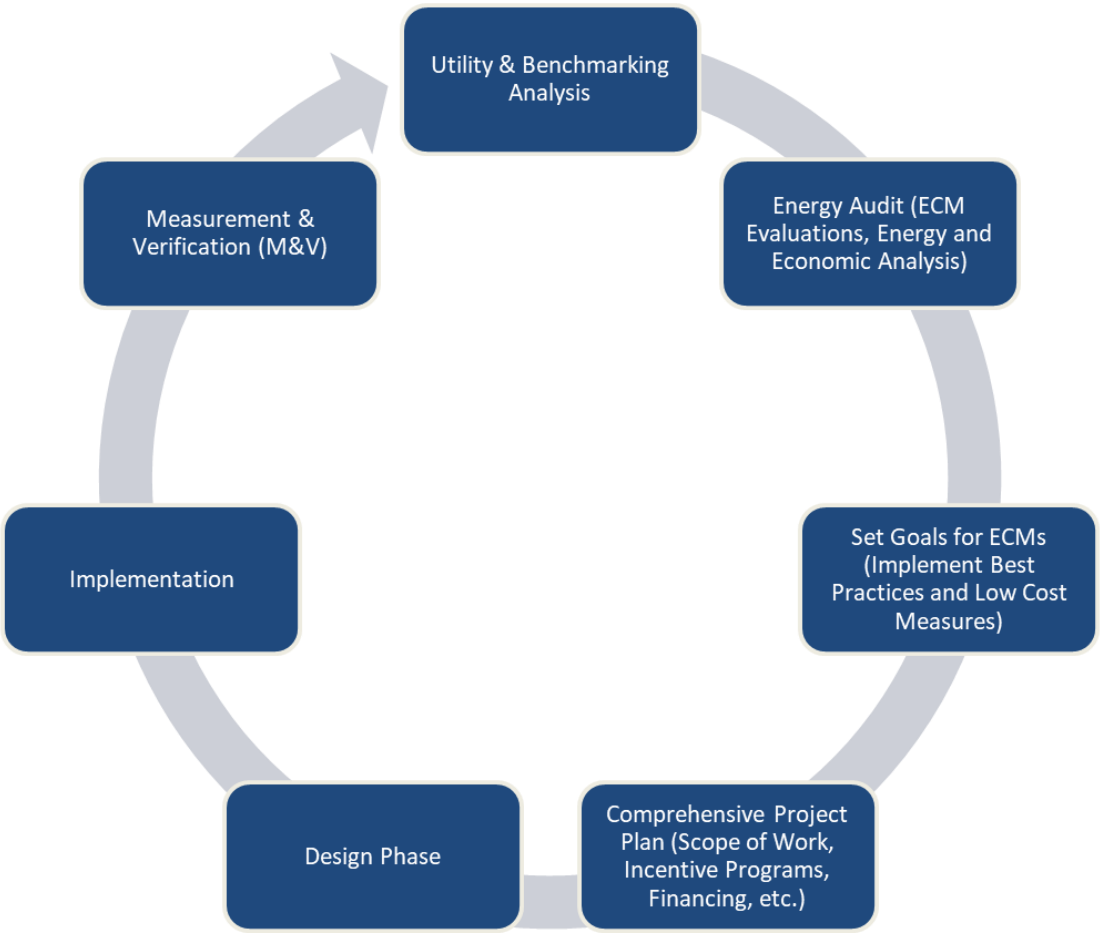


Figure 11 – Project Development Cycle

10 Energy Purchasing and Procurement Strategies

10.1 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. 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[8].

10.2 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 fluctuate monthly. The utility provides basic gas supply service 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[9].

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

[9] 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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Atrium 101W	24	Compact Fluorescent: (2) 13W Biaxial Plug-In Lamps	Wall Switch	S	26	4,380	2, 4	Relamp	Yes	24	LED Lamps: GX23 (Plug-In) Lamps	High/Low Control	19	3,022	0.3	1,463	0	$187	$1,500	$888	3.3
Atrium 101W	19	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	19	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.4	1,977	0	$253	$1,247	$760	1.9
Conference 107W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	339	0	$43	$189	$40	3.4
Conference 145W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	339	0	$43	$189	$40	3.4
Corridor - 1st Probation	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.2	1,040	0	$133	$633	$400	1.7
Corridor - Sally Port	5	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	5	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,022	0.2	928	0	$119	$587	$225	3.0
Corridor 147	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
Corridor 147	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,022	0.2	1,113	0	$143	$660	$270	2.7
Corridor 1st - Judges	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
Corridor 1st - Judges	13	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	2, 4	Relamp	Yes	13	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.9	4,549	-1	$583	$1,624	$715	1.6
Corridor 1st - Jury Assembly	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	2, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.1	700	0	$90	$371	$110	2.9
Corridor 1st - Public East	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
Corridor 1st - Public East	19	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	19	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,022	0.7	3,526	-1	$452	$2,277	$855	3.1
Corridor 1st - Public West	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
Corridor 1st - Public West	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.3	1,457	0	$187	$931	$560	2.0
Corridor 1st - Sheriff	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
Corridor 1st - Sheriff	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	2, 4	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.7	3,850	-1	$493	$1,253	$605	1.3
Courtroom 1A	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.3	1,421	0	$182	$832	$150	3.7
Courtroom 1A	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.7	3,285	-1	$421	$1,073	$255	1.9
Courtroom 1B	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.3	1,421	0	$182	$832	$150	3.7
Courtroom 1B	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.7	3,285	-1	$421	$1,073	$255	1.9
Courtroom 1C	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
Courtroom 1C	6	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,579	0.1	515	0	$66	$465	$71	6.0
Courtroom 1C	80	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	80	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	1.6	7,103	-2	$910	$3,081	$610	2.7
Courtroom 1C	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.6	2,688	-1	$344	$927	$215	2.1

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Electrical Room 111E	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.1	78	0	$10	$73	$20	5.3
Electrical Room 115W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.1	78	0	$10	$73	$20	5.3
Electrical Room 121	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2	Relamp	No	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,092	0.3	396	0	$51	$438	$120	6.3
Electrical Room 127W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.1	78	0	$10	$73	$20	5.3
Garage - Sally Port	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	1,017	0	$130	$489	$95	3.0
Janitorial 147	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	1,092	3	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	753	0.0	21	0	$3	$116	$20	35.4
Janitorial 1st West Public	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.0	39	0	$5	$37	$10	5.3
Library 145W	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,738	3	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.0	109	0	$14	$270	$35	16.9
Library 145W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Lobby - Side Exit	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,380	4	None	Yes	4	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.0	85	0	$11	$225	$140	7.8
Lobby 133E	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,380	2, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	3,022	0.0	201	0	$26	$290	$82	8.1
Lobby 161	5	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	4,380	2, 4	Relamp	Yes	5	LED Lamps: A19 Lamps	High/Low Control	10	3,022	0.3	1,374	0	$176	$311	$180	0.7
Lobby 161	13	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	2, 4	Relamp	Yes	13	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.9	4,549	-1	$583	$1,624	$715	1.6
Locker Room - 142E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Locker Room 128E	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	7	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	621	0	$80	$398	$70	4.1
Lounge 146E	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.6	2,688	-1	$344	$927	$215	2.1
Main Lobby	2	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	4,380	2, 4	Relamp	Yes	2	LED Lamps: A19 Lamps	High/Low Control	10	3,022	0.1	550	0	$70	$259	$72	2.7
Main Lobby	2	LED Lamps: (1) 25W Corn Bulb Screw-In Lamp	Wall Switch	S	25	4,380	4	None	Yes	2	LED Lamps: (1) 25W Corn Bulb Screw-In Lamp	High/Low Control	25	3,022	0.0	73	0	$9	$225	$70	16.5
Main Lobby	13	LED - Fixtures: Ceiling Mount	Wall Switch	S	50	4,380	4	None	Yes	13	LED - Fixtures: Ceiling Mount	High/Low Control	50	3,022	0.2	953	0	$122	$675	$455	1.8
Main Lobby	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	2, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.4	2,100	0	$269	$663	$330	1.2
Mechanical - Elevators 2 & 3	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.2	234	0	$30	$219	$60	5.3
Mechanical 125	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.5	623	0	$80	$584	$160	5.3
Mechanical 128	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.2	234	0	$30	$219	$60	5.3
Office - 105W	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Office - 107W	23	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	23	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.9	3,898	-1	$499	$1,380	$300	2.2

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office - 108W	39	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	39	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	1.4	6,610	-1	$847	$2,234	$495	2.1
Office - 109W	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.5	2,203	0	$282	$745	$165	2.1
Office - 110E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,738	0.0	226	0	$29	$73	$20	1.8
Office - 114E	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,738	0.0	65	0	$8	$33	$6	3.2
Office - 114E	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Office - 115E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Office - 118	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,738	0.0	226	0	$29	$73	$20	1.8
Office - 123E	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.2	896	0	$115	$489	$95	3.4
Office - 124E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,738	0.0	226	0	$29	$73	$20	1.8
Office - 124E #2	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office - 126E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,738	0.0	226	0	$29	$73	$20	1.8
Office - 126W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	339	0	$43	$189	$40	3.4
Office - 128W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Office - 129W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Office - 130W	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.5	2,373	-1	$304	$781	$175	2.0
Office - 131W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Office - 133W	23	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	23	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.9	3,898	-1	$499	$1,380	$300	2.2
Office - 133W	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.8	3,583	-1	$459	$1,146	$275	1.9
Office - 134e	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,579	0.0	172	0	$22	$181	$32	6.8
Office - 134W	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office - 135W	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	40	3,738	3	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,579	0.0	100	0	$13	$116	$20	7.5
Office - 135W	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,738	0.0	65	0	$8	$33	$6	3.2
Office - 135W	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.3	1,186	0	$152	$526	$105	2.8
Office - 136E	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,738	0.0	65	0	$8	$33	$6	3.2
Office - 136E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9

Location	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office - 137E	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.2	896	0	$115	$489	$95	3.4
Office - 140W	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.6	2,881	-1	$369	$1,161	$240	2.5
Office - 141W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office - 142W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	339	0	$43	$189	$40	3.4
Office - 143E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office - 143W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office - 144W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office - 145W	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,738	0.0	65	0	$8	$33	$6	3.2
Office - 145W	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Office - 153E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office - 154E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,738	0.0	226	0	$29	$73	$20	1.8
Office - 155E	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,738	0.0	65	0	$8	$33	$6	3.2
Office - 155E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Office 106W	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Office 113W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office 113W	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,738	0.0	226	0	$29	$73	$20	1.8
Office 116W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	339	0	$43	$189	$40	3.4
Office 118W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Office 119W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Restroom - 115	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Restroom - 136	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 145	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - Female 114	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Restroom - Female 1st Floor East Lounge	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	444	0	$57	$361	$60	5.3
Restroom - Female 1st Floor East Public	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restroom - Female 1st Floor East Public	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Restroom - Female 1st Floor East Public	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Restroom - Female 1st Jury Assembly	4	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	S	27	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 3' Lamp	Occupancy Sensor	11	2,579	0.1	319	0	$41	$343	$55	7.1
Restroom - Female 1st Jury Assembly	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	266	0	$34	$325	$50	8.1
Restroom - Female 1st Public West	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	7	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	621	0	$80	$398	$70	4.1
Restroom - Male 114	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Restroom - Male 1st Floor East Lounge	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	444	0	$57	$361	$60	5.3
Restroom - Male 1st Floor East Public	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6
Restroom - Male 1st Floor East Public	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Restroom - Male 1st Floor East Public	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Restroom - Male 1st Jury Assembly	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	40	3,738	3	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,579	0.0	100	0	$13	$116	$20	7.5
Restroom - Male 1st Jury Assembly	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	3,738		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	0	0	$0	$0	$0	0.0
Restroom - Male 1st Jury Assembly	2	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	S	27	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (1) 3' Lamp	Occupancy Sensor	11	2,579	0.0	159	0	$20	$153	$30	6.0
Restroom - Male 1st Public West	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	3,738		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	0	0	$0	$0	$0	0.0
Restroom - Male 1st Public West	4	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	S	27	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 3' Lamp	Occupancy Sensor	11	2,579	0.1	319	0	$41	$343	$55	7.1
Stairs A	13	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch		27	4,380	2, 4	Relamp	Yes	13	LED - Linear Tubes: (1) 3' Lamp	High/Low Control	11	3,022	0.2	1,215	0	$156	$912	$520	2.5
Stairs A	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	None		32	4,380	2, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.1	312	0	$40	$55	$15	1.0
Stairs B	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	4,380	2, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.3	1,589	0	$203	$742	$360	1.9
Stairs C	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
Stairs C	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	4,380	2, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.2	1,192	0	$153	$444	$270	1.1
Stairs D	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
Stairs D	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	4,380	2, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.3	1,589	0	$203	$742	$360	1.9
Stairs E	10	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch		27	4,380	2, 4	Relamp	Yes	10	LED - Linear Tubes: (1) 3' Lamp	High/Low Control	11	3,022	0.2	934	0	$120	$633	$400	1.9
Stairs E	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	None		32	4,380	2, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.1	312	0	$40	$280	$120	4.0
Storage - 129E	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	40	1,092		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	40	1,092	0.0	0	0	$0	$0	$0	0.0

Location	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Storage - 130E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,092	0.0	66	0	$8	$73	$20	6.3
Storage - 148E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,092	0.0	66	0	$8	$73	$20	6.3
Storage - Judge Corridor	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,092	0.0	66	0	$8	$73	$20	6.3
Storage 114W	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.0	39	0	$5	$37	$10	5.3
Storage 120W	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.0	39	0	$5	$37	$10	5.3
Atrium 2nd	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	4,380	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	4,380	0.0	260	0	$33	$17	$1	0.5
Atrium 2nd	4	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	4,380	4	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	50	3,022	0.1	293	0	$38	$225	$140	2.3
Atrium 2nd	4	LED - Fixtures: Ceiling Mount	Wall Switch	S	20	4,380	4	None	Yes	4	LED - Fixtures: Ceiling Mount	High/Low Control	20	3,022	0.0	117	0	$15	$225	$140	5.7
Atrium 2nd	17	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	17	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.3	1,769	0	$227	$985	$680	1.3
Conference 207W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Conference 219	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Conference 232E	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.2	896	0	$115	$489	$95	3.4
Conference 251E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Conference 253E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Conference 255E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Conference 2D	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Conference 2E	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Conference 2F	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.8	3,583	-1	$459	$1,146	$275	1.9
Corridor - 2nd Courtrooms C/D/E	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.4	1,873	0	$240	$1,004	$720	1.2
Corridor - 2nd Courtrooms C/D/E	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.1	397	0	$51	$298	$90	4.1
Corridor - 2nd Holding Cell	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	9	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.2	936	0	$120	$614	$360	2.1
Corridor - 2nd Probation	22	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	22	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.4	2,289	0	$293	$1,302	$880	1.4
Corridor - 2nd Probation	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	2, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.1	700	0	$90	$371	$110	2.9
Corridor - 2nd Secured Area East	20	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	20	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,022	0.7	3,711	-1	$475	$2,349	$900	3.0
Corridor - 2nd Secured Area West	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

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Corridor - 2nd Secured Area West	63	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	63	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	1.2	6,555	-1	$839	$3,625	$2,520	1.3
Corridor - 2nd Secured Area West	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.4	1,986	0	$254	$815	$450	1.4
Corridor - 2nd Waiting Area	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
Corridor - 2nd Waiting Area	19	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,380	2, 4	Relamp	Yes	19	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	3,022	0.4	1,912	0	$245	$1,518	$779	3.0
Corridor - 2nd Waiting Area	24	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	2, 4	Relamp	Yes	24	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	1.6	8,399	-2	$1,076	$2,653	$1,320	1.2
Courtroom 260W	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.3	1,356	0	$174	$562	$115	2.6
Courtroom 2A	8	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	8	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.4	1,876	0	$240	$408	$43	1.5
Courtroom 2A	11	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	11	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.2	977	0	$125	$471	$90	3.0
Courtroom 2C	18	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	18	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.9	4,221	-1	$541	$850	$88	1.4
Courtroom 2C	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.3	1,421	0	$182	$832	$150	3.7
Courtroom 2D	18	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	18	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.9	4,221	-1	$541	$850	$88	1.4
Courtroom 2D	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.3	1,421	0	$182	$832	$150	3.7
Courtroom 2E	6	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	6	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.3	1,407	0	$180	$373	$41	1.8
Courtroom 2E	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	533	0	$68	$380	$65	4.6
Courtroom 2E	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Courtroom 2F	7	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	7	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.4	1,642	0	$210	$391	$42	1.7
Courtroom 2F	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.2	1,065	0	$136	$489	$95	2.9
Courtroom 2F	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,493	0	$191	$635	$135	2.6
Courtroom 2G	7	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	7	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.4	1,642	0	$210	$391	$42	1.7
Courtroom 2G	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.2	1,065	0	$136	$489	$95	2.9
Courtroom 2G	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,493	0	$191	$635	$135	2.6
Dining Area 259E	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.6	2,688	-1	$344	$927	$215	2.1
Electrical Room - Holding Cell	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	1,092		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.0	0	0	$0	$0	$0	0.0
Electrical Room 211E	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,092	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,092	0.0	41	0	$5	$37	$10	5.0
Holding Cell - Restroom	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Holding Cell #1	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6
Holding Cell #2	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6
Holding Cell #3	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6
Holding Cell #4	6	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	6	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.3	1,407	0	$180	$373	$41	1.8
Janitorial 245E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,092	0.0	66	0	$8	$73	$20	6.3
Janitorial 2nd West Public	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,092	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,092	0.0	19	0	$2	$33	$6	11.0
Mechanical - 209E	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.1	156	0	$20	$146	$40	5.3
Office - 218W	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	9	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.2	799	0	$102	$434	$80	3.5
Office - 218W	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Office - 224W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office 208W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	339	0	$43	$189	$40	3.4
Office 209W	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Office 210W	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.7	3,220	-1	$412	$1,234	$260	2.4
Office 211W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office 212W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Office 213W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office 213W	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.8	3,583	-1	$459	$1,146	$275	1.9
Office 214E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Office 214W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office 224W #1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Office 225E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Office 226E	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.5	2,090	0	$268	$781	$175	2.3
Office 230W	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.3	1,356	0	$174	$562	$115	2.6
Office 233E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Office 233W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	339	0	$43	$189	$40	3.4

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office 234E	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Office 234W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office 234W	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Office 236W	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	339	0	$43	$189	$40	3.4
Office 238W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office 239E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office 239W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office 240E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office 240W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office 240W	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Office 241E	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.7	2,986	-1	$382	$1,000	$235	2.0
Office 242E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Office 243E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office 244W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office 244W	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Office 246W	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	1,017	0	$130	$489	$95	3.0
Office 247W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office 247W	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Office 254W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office 256E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office 257E	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.2	896	0	$115	$489	$95	3.4
Office 261W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Restroom - 225	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 233E	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 234	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restroom - 240	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 244	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 247	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 261	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.0	178	0	$23	$153	$30	5.4
Restroom - Female 2nd Floor East Public	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6
Restroom - Female 2nd Floor East Public	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Restroom - Female 2nd Floor East Secured Area	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	S	9	2,579		None	No	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	2,579	0.0	0	0	$0	$0	$0	0.0
Restroom - Female 2nd Floor East Secured Area	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Restroom - Female 2nd Floor West Public	3	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	S	27	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (1) 3' Lamp	Occupancy Sensor	11	2,579	0.1	239	0	$31	$325	$50	9.0
Restroom - Female 2nd Floor West Public	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	444	0	$57	$361	$60	5.3
Restroom - Male 2nd Floor East Public	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6
Restroom - Male 2nd Floor East Public	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Restroom - Male 2nd Floor East Secured Area	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	S	9	2,579		None	No	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	2,579	0.0	0	0	$0	$0	$0	0.0
Restroom - Male 2nd Floor East Secured Area	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Restroom - Male 2nd Floor West Public	5	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	S	27	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 3' Lamp	Occupancy Sensor	11	2,579	0.1	399	0	$51	$361	$60	5.9
Restroom - Male 2nd Floor West Public	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Storage 210E	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,092	2, 3	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	753	0.0	52	0	$7	$153	$10	21.5
Storage 218W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	753	0.1	149	0	$19	$380	$30	18.4
Storage 229W	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,092	2, 3	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	753	0.2	259	0	$33	$453	$50	12.1
Storage 250E	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2, 3	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	753	0.2	262	0	$34	$489	$60	12.8
Storage 257W	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	753	0.3	396	0	$51	$562	$80	9.5
3rd Floor Holding Cell	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
3rd Floor Holding Cell #1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
3rd Floor Holding Cell #2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
3rd Floor Holding Cell #3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
3rd Floor Holding Cell #4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Atrium 3rd	8	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	4,380	2, 4	Relamp	Yes	8	LED Lamps: A19 Lamps	High/Low Control	10	3,022	0.4	2,199	0	$282	$588	$288	1.1
Atrium 3rd	24	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	24	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.5	2,497	-1	$320	$1,338	$960	1.2
Classroom 3G	9	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	40	3,738	3	None	Yes	9	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,579	0.1	450	0	$58	$270	$35	4.1
Classroom 3G	10	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	3,738	3	None	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.0	181	0	$23	$270	$35	10.1
Classroom 3G	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.4	2,034	0	$260	$708	$155	2.1
Conference 311E	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	3,738		None	No	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	9	3,738	0.0	0	0	$0	$0	$0	0.0
Conference 311E	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.6	2,688	-1	$344	$927	$215	2.1
Conference 317W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Conference 337E	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,493	0	$191	$635	$135	2.6
Conference 347E	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.7	3,285	-1	$421	$1,073	$255	1.9
Conference 349E	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.5	2,389	-1	$306	$854	$195	2.2
Conference 361E	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,493	0	$191	$635	$135	2.6
Conference 3J	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Conference 3K	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,738	0.0	65	0	$8	$33	$6	3.2
Conference 3K	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Corridor - 3rd Holding Cell	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,022	0.1	371	0	$48	$370	$90	5.9
Corridor - 3rd Judges East	25	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,380	2, 4	Relamp	Yes	25	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	3,022	0.5	2,515	-1	$322	$1,938	$1,025	2.8
Corridor - 3rd Public East	10	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,380	2, 4	Relamp	Yes	10	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	3,022	0.2	1,006	0	$129	$775	$410	2.8
Corridor - Courtroom 3E	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.2	832	0	$107	$596	$320	2.6
Corridor - Courtroom 3E	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.0	199	0	$25	$37	$10	1.0
Corridor - Courtroom 3G	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	4,380	4	None	Yes	2	LED Lamps: (1) 9W A19 Screw-In Lamp	High/Low Control	9	3,022	0.0	26	0	$3	$225	$70	45.9
Corridor - Courtroom 3G	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,380	4	None	Yes	2	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.0	43	0	$5	$225	$70	28.5
Corridor - Courtroom 3G	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.1	397	0	$51	$298	$90	4.1
Corridor 3rd - West Judges	43	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,380	2, 4	Relamp	Yes	43	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.8	4,474	-1	$573	$2,585	$1,720	1.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Courtroom 3A	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.7	2,986	-1	$382	$1,000	$235	2.0
Courtroom 3A	47	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	47	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.9	4,173	-1	$534	$1,938	$375	2.9
Courtroom 3A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Courtroom 3B	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.6	2,688	-1	$344	$927	$215	2.1
Courtroom 3B	47	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	47	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.9	4,173	-1	$534	$1,938	$375	2.9
Courtroom 3C	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.7	2,986	-1	$382	$1,000	$235	2.0
Courtroom 3C	49	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	49	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	1.0	4,350	-1	$557	$1,975	$385	2.9
Courtroom 3D	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	3,738	3	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.2	726	0	$93	$270	$35	2.5
Courtroom 3D	49	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	49	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	1.0	4,350	-1	$557	$1,975	$385	2.9
Courtroom 3E	22	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	22	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	1.1	5,159	-1	$661	$919	$92	1.3
Courtroom 3E	28	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	28	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.5	2,486	-1	$318	$1,051	$210	2.6
Courtroom 3F	14	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	14	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.7	3,283	-1	$420	$511	$49	1.1
Courtroom 3F	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Courtroom 3H	14	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	14	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.7	3,283	-1	$420	$511	$49	1.1
Courtroom 3H	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Electrical Room - 3rd Floor Holding Cell	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.0	39	0	$5	$37	$10	5.3
Electrical Room 308	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.1	117	0	$15	$110	$30	5.3
Electrical Room 341W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.1	156	0	$20	$146	$40	5.3
Janitorial 3rd West Public	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,092	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,092	0.0	19	0	$2	$33	$6	11.0
Kitchen 345E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Lobby - 3rd Public Waiting Area East	20	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	20	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,022	0.7	3,711	-1	$475	$2,349	$900	3.0
Lobby 316W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,380	2, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.1	795	0	$102	$371	$180	1.9
Lounge 355E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Mechanical 311E	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.1	156	0	$20	$146	$40	5.3
Office - 301W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office - 312W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office - 313W	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	1,017	0	$130	$489	$95	3.0
Office - 319W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office - 321E	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.5	2,389	-1	$306	$854	$195	2.2
Office - 324E	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.8	3,583	-1	$459	$1,146	$275	1.9
Office - 325E	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.5	2,389	-1	$306	$854	$195	2.2
Office - 328E	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Office - 329E	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.8	3,583	-1	$459	$1,146	$275	1.9
Office - 329W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office - 330E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office - 330W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office - 332W	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	1,017	0	$130	$489	$95	3.0
Office - 334W	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	444	0	$57	$361	$60	5.3
Office - 334W	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office - 335E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office - 335W A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Office - 335W B	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Office - 336E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.1	597	0	$76	$262	$60	2.6
Office - 337W	4	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2, 3	Relamp	Yes	4	LED Lamps: A19 Lamps	Occupancy Sensor	10	2,579	0.2	938	0	$120	$339	$39	2.5
Office - 337W	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	40	3,738	3	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,579	0.0	100	0	$13	$116	$20	7.5
Office - 337W	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.6	2,712	-1	$347	$1,124	$230	2.6
Office - 337W Loft	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.8	3,559	-1	$456	$1,307	$280	2.3
Office - 339E	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Office - 339W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office - 340E	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,493	0	$191	$635	$135	2.6

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office - 340W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office - 341E	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.2	896	0	$115	$489	$95	3.4
Office - 346E	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.2	896	0	$115	$489	$95	3.4
Office - 350W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office - 351W	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.3	1,525	0	$195	$599	$125	2.4
Office - 354W	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	847	0	$109	$453	$85	3.4
Office - 356E	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.5	2,389	-1	$306	$854	$195	2.2
Office - 357E	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.3	1,194	0	$153	$562	$115	2.9
Office - 361W	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	508	0	$65	$380	$65	4.8
Office - 362W	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.2	1,017	0	$130	$489	$95	3.0
Office - 3rd Floor Holding Cell	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,738	0.0	117	0	$15	$72	$10	4.2
Office 315E	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,738	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,579	0.4	1,792	0	$229	$708	$155	2.4
Restroom - 311 #1	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 311 #2	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 312	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 319W	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 325	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 332W	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 335W A	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 337	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 339E	2	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	S	27	3,738	2, 3	Relamp	Yes	2	LED - Linear Tubes: (1) 3' Lamp	Occupancy Sensor	11	2,579	0.0	159	0	$20	$153	$30	6.0
Restroom - 349 #1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Restroom - 349 #2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,738	0.0	133	0	$17	$37	$10	1.6
Restroom - 350	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 354	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restroom - 355E	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - 3D	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,738	0.0	71	0	$9	$18	$5	1.5
Restroom - Female 3rd Floor East Public	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6
Restroom - Female 3rd Floor East Public	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Restroom - Female 3rd Floor West Public	1	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	S	27	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	3,738	0.0	67	0	$9	$18	$5	1.6
Restroom - Female 3rd Floor West Public	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	444	0	$57	$361	$60	5.3
Restroom - Male 3rd Floor East Public	1	Incandescent: (1) 65W A19 Screw-In Lamp	Wall Switch	S	65	3,738	2	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	10	3,738	0.0	222	0	$28	$17	$1	0.6
Restroom - Male 3rd Floor East Public	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,738	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,579	0.1	678	0	$87	$416	$75	3.9
Restroom - Male 3rd Floor West Public	1	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	S	27	3,738	2	Relamp	No	1	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	3,738	0.0	67	0	$9	$18	$5	1.6
Restroom - Male 3rd Floor West Public	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,738	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,579	0.1	444	0	$57	$361	$60	5.3
Storage - 310E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,092	0.0	66	0	$8	$73	$20	6.3
Storage - 3rd Public East	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,092	0.0	66	0	$8	$73	$20	6.3
Storage 316W	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.0	39	0	$5	$37	$10	5.3
Storage 331E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2, 3	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	753	0.1	174	0	$22	$262	$40	9.9
Storage 348E	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,092	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,092	0.0	66	0	$8	$73	$20	6.3
Mechanical - Elevators 5 6 7	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.1	117	0	$15	$110	$30	5.3
Mechanical - Penthouse	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	28	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.8	1,090	0	$140	$1,022	$280	5.3
Mechanical - Penthouse	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,092	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,092	0.0	19	0	$2	$33	$6	11.0
Mechanical - Penthouse #2	31	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,092	2	Relamp	No	31	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,092	0.9	1,206	0	$155	$1,132	$310	5.3
Exterior	2	LED - Fixtures: Ceiling Mount	Timeclock		20	4,745		None	No	2	LED - Fixtures: Ceiling Mount	Timeclock	20	4,745	0.0	0	0	$0	$0	$0	0.0
Exterior	2	LED - Fixtures: Wall Sconces	Timeclock		20	4,745		None	No	2	LED - Fixtures: Wall Sconces	Timeclock	20	4,745	0.0	0	0	$0	$0	$0	0.0
Exterior	6	Metal Halide: (1) 150W Lamp	Timeclock		190	4,745	1	Fixture Replacement	No	6	LED - Fixtures: Ceiling Mount	Timeclock	45	4,745	0.0	4,128	0	$540	$1,782	$30	3.2

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?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical - Penthouse	Boiler #1	1	Combustion Air Fan	5.0	84.0%	No	Cleaver Brooks		B	4,220	5	Yes	86.5%	No		0.1	406	0	$53	$1,191	$0	22.4
Mechanical - Penthouse	Boiler #2	1	Combustion Air Fan	2.0	84.0%	No	Cleaver Brooks		B	4,220	5	Yes	85.5%	No		0.0	99	0	$13	$996	$0	77.1
Mechanical - Penthouse	Condenser Water Loop	1	Condenser Water Pump	20.0	91.0%	No	Baldor		B	3,391	8	No	93.0%	Yes	1	3.9	21,656	0	$2,835	$10,892	$1,300	3.4
Mechanical - Penthouse	Condenser Water Loop	1	Condenser Water Pump	50.0	93.0%	No	Emerson		B	4,067	8	No	94.5%	Yes	1	9.6	62,917	0	$8,237	$21,858	$3,000	2.3
Mechanical - Penthouse	Condenser Water Loop	1	Condenser Water Pump	50.0	93.0%	No	US Motors		B	4,067	8	No	94.5%	Yes	1	9.6	62,917	0	$8,237	$21,858	$3,000	2.3
Mechanical - Penthouse	Chilled Water Loop	1	Chilled Water Pump	15.0	93.0%	No	Marathon		W	3,391	8	No	93.0%	Yes	1	2.8	15,301	0	$2,003	$9,177	$1,200	4.0
Mechanical - Penthouse	Chilled Water Loop	1	Chilled Water Pump	15.0	91.0%	No	Baldor		B	3,391	8	No	93.0%	Yes	1	2.9	16,242	0	$2,127	$9,177	$1,200	3.8
Mechanical - Penthouse	Heating System	2	Heating Hot Water Pump	0.5	75.0%	No			B	2,745	5	Yes	78.2%	No		0.0	84	0	$11	$938	$0	85.5
Mechanical - Penthouse	Heating System	2	Heating Hot Water Pump	10.0	88.5%	No	US Motors		B	3,391	9	No	91.7%	Yes	2	2.2	22,785	0	$2,983	$13,393	$2,200	3.8
Mechanical - Penthouse	Heating System	1	Heating Hot Water Pump	15.0	91.0%	No	Baldor		B	3,391	9	No	93.0%	Yes	1	1.6	16,242	0	$2,127	$9,177	$1,200	3.8
Mechanical - Penthouse	Heating System	1	Heating Hot Water Pump	15.0	93.0%	No	Baldor		W	3,391	9	No	93.0%	Yes	1	1.4	15,301	0	$2,003	$9,177	$1,200	4.0
Mechanical - Penthouse #2	Heating System	2	Heating Hot Water Pump	0.5	75.0%	No			B	2,745	5	Yes	78.2%	No		0.0	84	0	$11	$938	$0	85.5
Mechanical - Penthouse #2	Domestic Hot Water	1	DHW Circulation Pump	0.0	60.0%	No			W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Elevators 2 & 3	Elevators 2 & 3	2	Other	30.0	92.4%	No	GE		B	548		No	92.4%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Elevator 4	Elevator 4	1	Other	30.0	92.4%	No	GE		B	548		No	92.4%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Elevators 5 6 7	Elevators 5 & 6	2	Other	30.0	92.4%	No	AO Smith		W	548		No	92.4%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Elevators 5 6 7	Elevator 7	1	Other	25.0	91.7%	No	AO Smith		W	548		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	Lift Gate	1	Other	1.0	82.5%	No	LiftMaster		W	548		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 128	Domestic Cold Water	2	Process Pump	7.5	88.5%	Yes	Grundfos		W	4,380		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Penthouse	Glycol Pumps	2	Process Pump	0.0	60.0%	No			W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

		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?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Exhaust System	1	Exhaust Fan	0.3	65.0%	No	Cook		B	4,380	5	Yes	73.4%	No		0.0	144	0	$19	$455	$0	24.2
Roof	Exhaust System	2	Exhaust Fan	0.3	62.5%	No	Dayton		W	4,380		No	62.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust System	3	Exhaust Fan	0.5	75.0%	No	Various		B	4,380	5	Yes	78.2%	No		0.0	201	0	$26	$1,407	$0	53.6
Roof	Exhaust System	1	Exhaust Fan	1.0	82.5%	No	Greenheck		W	4,380	7	No	85.5%	Yes	1	0.3	1,579	0	$207	$3,508	$75	16.6
Roof	Cooling Tower	1	Cooling Tower Fan	25.0	91.7%	No			B	4,067	10	No	93.6%	Yes	1	-0.4	8,383	0	$1,098	$14,693	$1,400	12.1
Various	Unit Heaters	3	Supply Fan	0.1	60.0%	No			W	4,380		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Penthouse #2	Air Handling Unit 1 West Side	1	Supply Fan	60.0	95.0%	Yes	Century		W	5,329		No	95.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Penthouse #2	Air Handling Unit 1 West Side	1	Return Fan	20.0	93.0%	Yes	GE		W	5,329		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Penthouse #2	Air Handling Unit 2 East Side	1	Supply Fan	60.0	95.0%	Yes	Century		W	5,329		No	95.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Penthouse #2	Air Handling Unit 2 East Side	1	Return Fan	20.0	93.0%	Yes	Baldor		W	5,329		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - 209E	Air Handling Unit 2A 1F Lobby, 2F Jury, Court 1C	1	Supply Fan	10.0	91.7%	No	Baldor		W	4,380	6	No	91.7%	Yes	1	2.9	13,362	0	$1,749	$6,697	$1,100	3.2
Mechanical - 209E	Air Handling Unit 2B 1F Jury, 2F Corridors, 3F Corridors	1	Supply Fan	7.5	85.5%	No	Leland		B	4,380	6	No	91.0%	Yes	1	2.3	11,918	0	$1,560	$5,945	$1,000	3.2
Mechanical 311E	Air Handling Unit 3A Court 3B & 3D	1	Supply Fan	3.0	90.2%	No	US Motors		W	4,380	6	No	90.2%	Yes	1	0.9	4,075	0	$534	$4,555	$200	8.2
Mechanical 311E	Air Handling Unit 3B Courts 3A & 3C	1	Supply Fan	5.0	89.5%	No	US Motors		W	4,380	6	No	89.5%	Yes	1	1.4	6,845	0	$896	$5,028	$900	4.6

Packaged 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)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Manufacturer	Model	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/IEER/ EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical 125	Mechanical 125	1	Electric Resistance Heat		25.59		1 COP	Dayton		W		No							0.0	0	0	$0	$0	$0	0.0
Mechanical 128	Mechanical 128	1	Electric Resistance Heat		25.59		1 COP	Dayton		W		No							0.0	0	0	$0	$0	$0	0.0
Office - 337W	Office - 337W	1	Electric Resistance Heat		17.06		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
Office - 337W Loft	Office - 337W Loft	1	Electric Resistance Heat		17.06		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	Electrical Room 115W	1	Ductless Mini-Split AC	2.50		9.00		Mitsubishi	PU30EK3	B	11	Yes	1	Ductless Mini-Split AC	2.50		18.00		0.8	3,000	0	$393	$4,044	$0	10.3
Roof	Electrical Room 308	1	Ductless Mini-Split HP	3.00	36.00	15.90	9.2 HSPF	Daikin	RX36NMVJU	W		No							0.0	0	0	$0	$0	$0	0.0

Electric Chiller Inventory & Recommendations

		Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical - Penthouse	Cooling System - Chiller #1	1	Water-Cooled Centrifugal Chiller	150.00	York	YTG0A1B2-CGH	B	12	Yes	1	Water-Cooled Centrifugal Chiller	Variable	150.00	0.64	0.39	56.8	110,490	0	$14,466	$154,134	$4,500	10.3
Mechanical - Penthouse	Cooling System - Chiller #2	1	Water-Cooled Centrifugal Chiller	200.00	Trane	CVHE-020F	B	12	Yes	1	Water-Cooled Centrifugal Chiller	Variable	200.00	0.64	0.39	75.7	147,320	0	$19,288	$175,865	$6,000	8.8

Space Heating Boiler 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)	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical - Penthouse	Heating System - Boiler #1	1	Non-Condensing Hot Water Boiler	4,184	Cleaver Brooks	CB900-125	B	13	Yes	1	Non-Condensing Hot Water Boiler	4,184	85.00%	Ec	0.0	0	325	$4,364	$77,069	$0	17.7
Mechanical - Penthouse	Heating System - Boiler #2	1	Non-Condensing Hot Water Boiler	2,678	Cleaver Brooks	CB800-80	B	13	Yes	1	Non-Condensing Hot Water Boiler	2,678	85.00%	Ec	0.0	0	208	$2,793	$63,529	$3,481	21.5

Pipe Insulation Recommendations

		Recommendation Inputs			Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical - Penthouse	Domestic Hot Water	14	20	0.75	0.0	0	3	$46	$239	$40	4.3
Mechanical 125	Domestic Hot Water	14	20	2.00	0.0	2,865	0	$375	$266	$40	0.6
Mechanical - Penthouse #2	Domestic Hot Water	14	15	0.75	0.0	1,242	0	$163	$179	$30	0.9
Dining Area 259E	Domestic Hot Water	14	5	0.50	0.0	343	0	$45	$60	$5	1.2

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical - Penthouse	Domestic Hot Water - 3rd Floor	1	Tankless Water Heater	Navien	NR-210	W		No						0.0	0	0	$0	$0	$0	0.0
Electrical Room 111E	Domestic Hot Water - 1st Floor	1	Storage Tank Water Heater (≤ 50 Gal)	Bradford White	RE340S6-1NCWW	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical 125	Domestic Hot Water - 1st Floor	1	Storage Tank Water Heater (≤ 50 Gal)	Ruud	EGLS50-9-G	B		No						0.0	0	0	$0	$0	$0	0.0
Dining Area 259E	Domestic Hot Water - Dining Area 259E	1	Storage Tank Water Heater (≤ 50 Gal)	Bradford White	M120U6SS-1NAL	W		No						0.0	0	0	$0	$0	$0	0.0
Janitorial 245E	Domestic Hot Water - 2nd Floor	1	Storage Tank Water Heater (≤ 50 Gal)	Bradford White	RE340T6	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical - Penthouse #2	Domestic Hot Water - 3rd Floor	1	Storage Tank Water Heater (≤ 50 Gal)	Bradford White	RE340S6-1NCWW	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Atlantic County Civil Courthouse	15	56	Faucet Aerator (Lavatory)	2.20	0.50	0.0	7,785	0	$1,019	$402	$201	0.2
Atlantic County Civil Courthouse	15	15	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	7	$96	$108	$54	0.6

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	Manufacturer	Model	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Dining Area 259E	1	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)	True	GDM-26	No		No	0.0	0	0	$0	$0	$0	0.0
Dining Area 259E	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Avantco	178GDC49HCB	No		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
Atlantic County Civil Courthouse	1	Clothes Washer	1,200	No		
Atlantic County Civil Courthouse	27	Coffee Machine	500	No		
Atlantic County Civil Courthouse	361	Desktop	120	No		
Atlantic County Civil Courthouse	33	Microwave	1,000	No		
Atlantic County Civil Courthouse	18	Paper Shredder	146	No		
Atlantic County Civil Courthouse	53	Printer (Medium/Small)	450	No		
Atlantic County Civil Courthouse	33	Printer/Copier (Large)	600	No		
Atlantic County Civil Courthouse	5	Projector	240	No		
Atlantic County Civil Courthouse	33	Refrigerator (Mini)	175	No		
Atlantic County Civil Courthouse	11	Refrigerator (Residential)	340	No		
Atlantic County Civil Courthouse	2	Smart Board	215	Yes		
Atlantic County Civil Courthouse	37	Television	224	No		
Atlantic County Civil Courthouse	2	Toaster Oven	600	No		
Atlantic County Civil Courthouse	21	Water Cooler	192	No		
Atlantic County Civil Courthouse	1	Server	4,000	No		

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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Atlantic County Civil Courthouse	2	Non-Refrigerated	16	Yes	0.1	685	0	$90	$460	$0	5.1
Atlantic County Civil Courthouse	2	Refrigerated	16	Yes	0.4	3,224	0	$422	$460	$100	0.9

Custom (High Level) Measure Analysis

Electric Tank Water Heater to HPWH

NOTE: HPWH calculation should not be used for existing water heaters with a storage capacity greater than 120 gal.

Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis											
Description	Area(s)/System(s) Served	SF of Area Served	Fuel Type	Input Capacity per Unit (kW)	Tank Capacity per Unit (Gal)	Description	COP	Tank Capacity per Unit (Gal)	Estimated Unit Cost	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Payback w/ Incentives in Years
Storage Tank Water Heater (≤50 Gal)	Mechanical 125	10,000	Electric	9	50	Heat Pump Water Heater	2.5	50	$2,383.17	0.00	4,045	0	$530	$2,383	$0	$0	$0	$2,383	4.50	4.50
Storage Tank Water Heater (≤50 Gal)	Janitorial 245E	10,000	Electric	5	40	Heat Pump Water Heater	2.5	40	$2,069.90	0.00	4,045	0	$530	$2,070	$0	$0	$0	$2,070	3.91	3.91
Storage Tank Water Heater (≤50 Gal)	Mechanical - Penthouse #2	10,000	Electric	5	40	Heat Pump Water Heater	2.5	40	$2,069.90	0.00	4,045	0	$530	$2,070	$0	$0	$0	$2,070	3.91	3.91

APPENDIX B: ENERGY STAR STATEMENT OF ENERGY PERFORMANCE

Energy use intensity (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.

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

35

ENERGY STAR® Score[1]

Atlantic County Civil Courthouse

Primary Property Type: Courthouse
Gross Floor Area (ft²): 127,260
Built: 1975

For Year Ending: December 31, 2021
Date Generated: August 23, 2023

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
Atlantic County Civil Courthouse 1201 Bacharach Boulevard Atlantic City, New Jersey 08404	Atlantic County 1227 Drexel Avenue Atlantic City, NJ 08401 (609) 343-2284	Jerry Griffin 1227 Drexel Avenue Atlantic City, NJ 08401 (609) 343-2284 griffin_jerry@aclink.org

Property ID: 25082965

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
137.5 kBtu/ft²

Source EUI
245.9 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	9,695,135 (55%)
Electric - Solar (kBtu)	406,796 (2%)
Electric - Grid (kBtu)	7,393,637 (42%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	113.9
National Median Source EUI (kBtu/ft²)	203.7
% Diff from National Median Source EUI	21%

Annual Emissions

Total (Location-Based) GHG Emissions (Metric Tons CO2e/year)	1,159

Signature & Stamp of Verifying Professional

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

LP Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-_____
_____

Professional Engineer or Registered Architect 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 gas* 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 (II)	*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 $1/8^{th}$ 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.