Local Government Energy Audit Report

Lincoln Avenue School

March 23, 2023

Prepared for:
Orange Board of Education
216 Lincoln Avenue
Orange, New Jersey 07050

Prepared by:
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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.

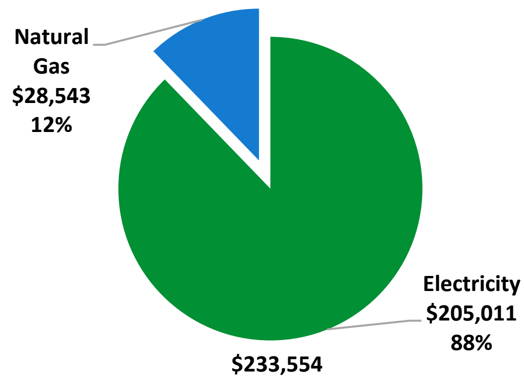
The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state, and federal requirements.

Table of Contents

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Lincoln Avenue School. 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: $233,554 Electricity: 1,596,398 kWh Natural Gas: 29,262 Therms	
ENERGY STAR® Benchmarking Score	37 *(1-100 scale)*	This building performs below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

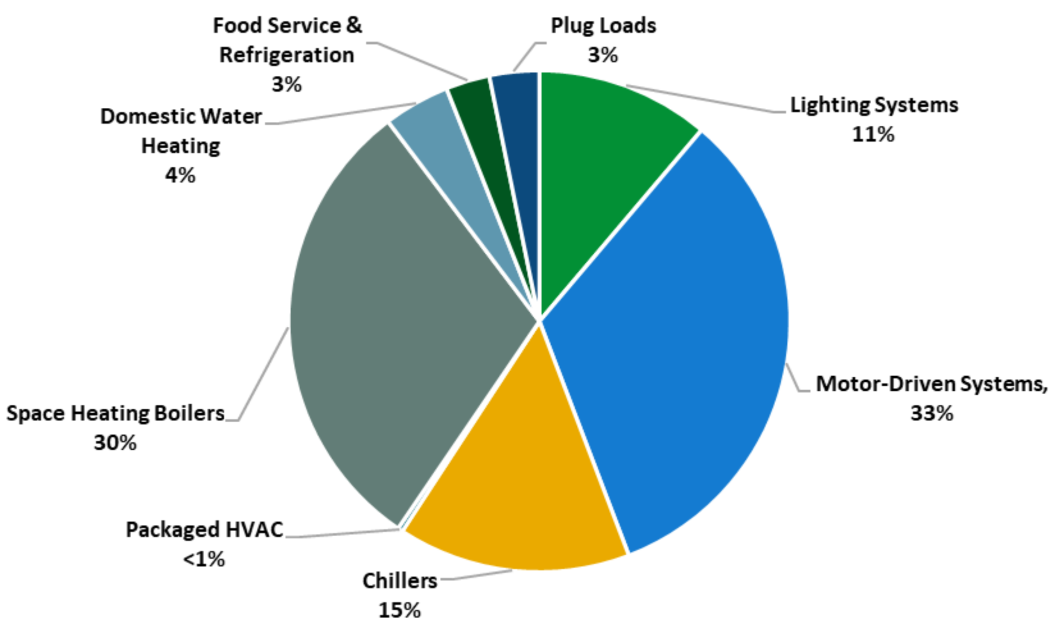


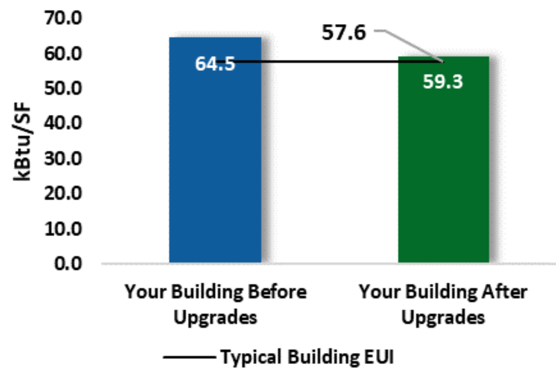
Figure 1 - Energy Use by System

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.

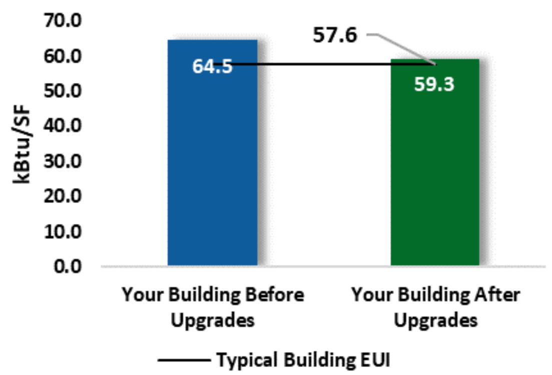
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$155,107
Potential Rebates & Incentives[1]	$29,436
Annual Cost Savings	$26,506
Annual Energy Savings	Electricity: 209,043 kWh Natural Gas: -348 Therms
Greenhouse Gas Emission Savings	103 Tons
Simple Payback	4.7 Years
Site Energy Savings (All Utilities)	8%



Scenario 2: Cost Effective Package[2]

Installation Cost	$151,759
Potential Rebates & Incentives	$29,286
Annual Cost Savings	$26,310
Annual Energy Savings	Electricity: 207,516 kWh Natural Gas: -348 Therms
Greenhouse Gas Emission Savings	102 Tons
Simple Payback	4.7 Years
Site Energy Savings (all utilities)	8%



On-site Generation Potential

Photovoltaic	Low
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			**183,347**	**53.3**	**-32**	**$23,230**	**$113,009**	**$19,833**	**$93,176**	**4.0**	**180,837**
ECM 1	Install LED Fixtures	Yes	51,455	7.3	-5	$6,560	$34,564	$5,700	$28,864	4.4	51,242
ECM 2	Retrofit Fixtures with LED Lamps	Yes	131,892	46.0	-27	$16,669	$78,445	$14,133	$64,312	3.9	129,595
Lighting Control Measures			**15,043**	**4.9**	**-3**	**$1,901**	**$31,259**	**$8,245**	**$23,014**	**12.1**	**14,780**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	11,534	3.8	-2	$1,458	$24,284	$2,985	$21,299	14.6	11,332
ECM 4	Install High/Low Lighting Controls	Yes	3,510	1.1	-1	$444	$6,975	$5,260	$1,715	3.9	3,448
Variable Frequency Drive (VFD) Measures			**7,818**	**2.2**	**0**	**$1,004**	**$5,945**	**$1,000**	**$4,945**	**4.9**	**7,873**
ECM 5	Install VFDs on Kitchen Hood Fan Motors	Yes	7,818	2.2	0	$1,004	$5,945	$1,000	$4,945	4.9	7,873
Domestic Water Heating Upgrade			**0**	**0.0**	**1**	**$8**	**$29**	**$8**	**$21**	**2.7**	**92**
ECM 6	Install Low-Flow DHW Devices	Yes	0	0.0	1	$8	$29	$8	$21	2.7	92
Food Service & Refrigeration Measures			**2,834**	**0.2**	**0**	**$364**	**$4,865**	**$350**	**$4,515**	**12.4**	**2,854**
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,307	0.2	0	$168	$1,517	$200	$1,317	7.8	1,316
ECM 8	Refrigeration Controls	No	1,527	0.1	0	$196	$3,348	$150	$3,198	16.3	1,538
TOTALS (COST EFFECTIVE MEASURES)			**207,516**	**60.6**	**-35**	**$26,310**	**$151,759**	**$29,286**	**$122,473**	**4.7**	**204,898**
TOTALS (ALL MEASURES)			**209,043**	**60.7**	**-35**	**$26,506**	**$155,107**	**$29,436**	**$125,671**	**4.7**	**206,436**

* - 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 Lincoln Avenue School. 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 October 18, 2022, TRC performed an energy audit at Lincoln Avenue School located in Orange, New Jersey. TRC met with facility staff to review the facility operations and help focus our investigation on specific energy-using systems.

Lincoln Avenue School is a three-story, 129,854 square foot building built in 1892 and an expansion/renovation in 2010. Spaces include classrooms, multipurpose room, offices, cafeteria, corridors, stairwells, staff dining room, commercial kitchen, and mechanical spaces.

2.2 Building Occupancy

The school is fully occupied from September through June. Typical weekday occupancy is 693 students and 98 staff members. Summer occupancy includes a summer day camp and continuing maintenance activities. Weekend activities vary by the season.

Building Name	Weekday/Weekend	Operating Schedule
Lincoln Avenue School	Weekday	6:30 AM - 10:30 PM
	Weekend	Varied

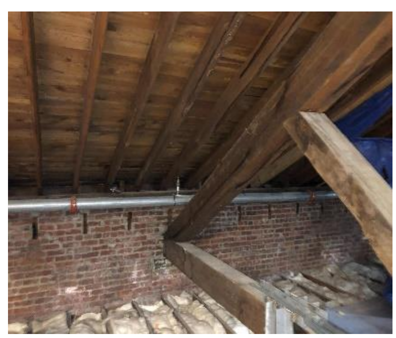
Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

Original building walls are brick and wood framed structure. The roof is pitched with a flat section at the top. It is covered with asphalt shingles. The addition is comprised of block over structural steel with a flat roof covered with a white membrane and is fair condition. It also has slightly pitched sections with a metal standing seam roof.

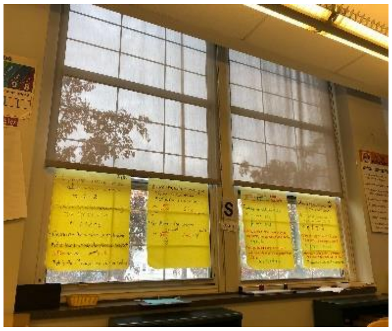
Exterior Addition

Roof Surfaces



Interior Structure

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



Windows of Original Building and Addition



Exterior Doors

2.4 Lighting Systems

The primary interior lighting system uses 28-Watt linear fluorescent T5 lamps. Fixture types include 1-lamp, 2-lamp, or 3-lamp, 4-foot-long recessed troffer and pendent mounted fixtures and 2-foot fixtures with linear tube lamps. Typically, T5 & T8 fluorescent lamps use electronic ballasts. Several areas have 54-Watt T5HO lamps.

Additionally, there are many compact fluorescent lamps (CFL) plug-ins and incandescent. Gymnasium fixtures have manually controlled high-bay high intensity discharge (HID) lamps. It also has incandescent lamps for auditorium functions.

All exit signs are LED. Most fixtures are in good condition. Interior lighting levels were generally sufficient. Most lighting fixtures are controlled by occupancy sensors and the remainder by wall switches.



Typical Classroom Lighting *Multipurpose Room Lighting* *Office Lighting*

Exterior fixtures include wall packs and bollards with high intensity discharge (HID) lamps. The pole mounted flood fixtures incorporate HID lamps. Exterior fixtures are timer controlled.



Wall Packs *Bollard* *Wall Packs*

The site has pole-mounted acorn top HID fixtures illuminating roadway and parking lot. The site lighting is fed from the main campus electric meter. Fixtures are controlled by a timeclock.



Pole Top Mounted Fixture *Pole Top Mounted Fixture* *Wall Mounted Fixture*

2.5 Air Handling Systems

Unit Ventilators

Unit ventilators are equipped with supply fan motors and BMS outside air dampers and fan coil valves connected to the hot water/chilled water distribution system. They provide heating, cooling, and ventilation to select rooms on the ground floor. A few stairwells and mechanical spaces are conditioned by unit heaters connected to the hot water/chilled water distribution system.


Unit Ventilators

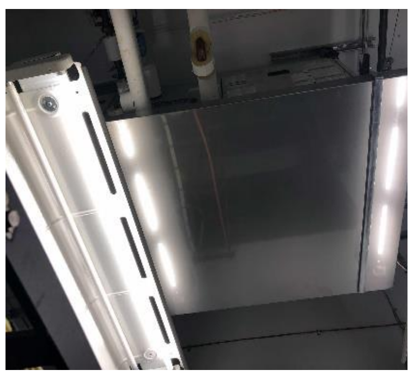

Unit Ventilators

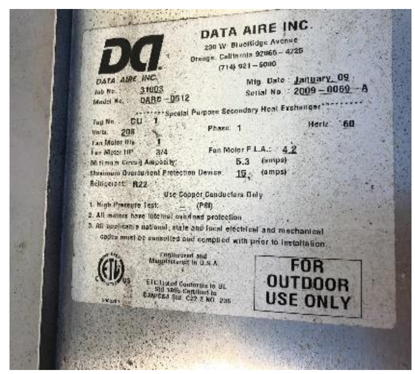

Unit Heater

Unitary Electric HVAC Equipment

The server room uses a split system for cooling. It is rated at 5 tons of capacity and designed specifically for data centers. It is fair condition.


Outdoor Condensing Unit


Indoor Air Handler



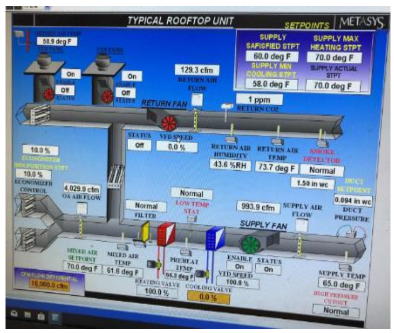
Unit Label

Air Handling Units (AHUs)

The facility is conditioned by a series of rooftop air handling units, indoor fan coil units, and make up air units. The rooftop units supply larger spaces in the building including the multipurpose room, library, and cafeteria. Each has a supply motor and return motor with a coil for heating and cooling. It is controlled by the BMS system.

The fan coil units supply heating and cooling to classrooms. It has a supply motor and is controlled by the BMS system. The make-up air units are connected sections of the building where fan coil units are installed. Each has a supply motor, return motor, and integrated enthalpy wheel to reduce heating/cooling load. It supplies heating, cooling, and ventilation and is controlled by the BMS.

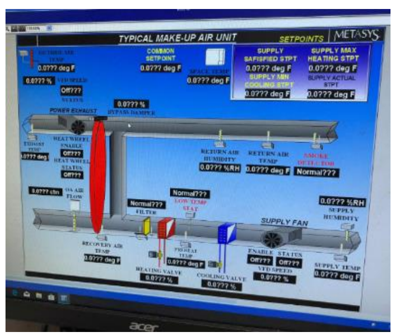
Rooftop AHU



BMS Diagram

Rooftop AHU

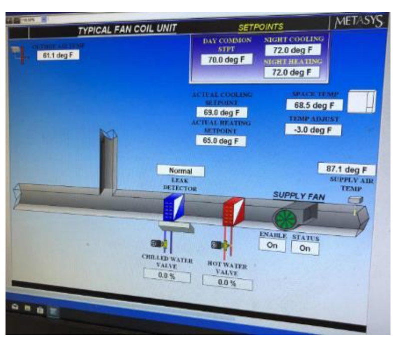
Make Up Air Unit



BMS Diagram

Dual Temp Piping

Fan Coil Units



BMS Diagram

Fan Coil Units

2.6 Heating Hot Water Systems

Three Aerco 2,000 MBh and three, 1,500 MBh hot water boilers with a nominal efficiency of 86% serve the building's heating load. The boilers are configured in two mechanical rooms with an automated control scheme. Multiple boilers are required under high load conditions. They are in fair condition. There is no service contract in place.

The hydronic distribution system is a two-pipe heating and cooling system. Seasonal changeover begins on October 15 for the heating season and April 15 for the cooling season.

The boilers are configured in two constant flow primary distribution with two, 15 hp VFD controlled, and two, 30 hp VFD controlled hot water pumps operating with a lead-lag control scheme. The boilers provide hot water to unit ventilators, fan coil units, makeup air units, rooftop AHUs throughout the building. A three-way valve controls the cooling/heating loop the BAS.

Boilers in Addition

Heating Hot Water Pumps for Addition

Boilers in Main Building

2.7 Chilled Water Systems

The chiller plant consists of a two, 300-ton, Trane, R-134A, screw chillers (CH1 and CH2). The chillers are configured in a primary-secondary distribution loop with three constant flow primary pumps and two variable flow secondary pumps.

The chiller is supplied by a dedicated 25 hp primary pump. The secondary distribution system is supplied by two. 50 hp pumps with variable frequency drives that control the secondary distribution pumps.

The chilled water system is connected to the BMS. It operates on the dual temperature two pipe system with the boilers described above.

Air-Cooled Screw Chillers

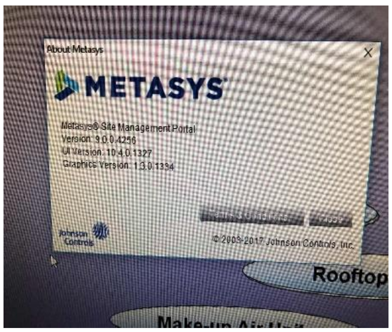
Air-Cooled Screw Chillers

Chilled Water Pumps

2.8 Building Automation System (BAS)

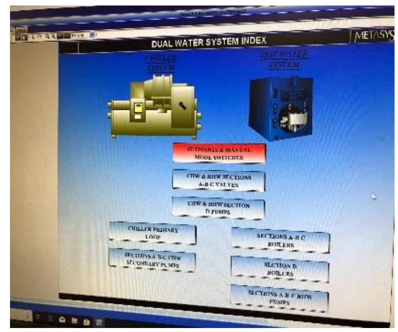
A Johnson Controls BAS controls the HVAC equipment, boilers, chillers, air handlers, fan coil units, and make up air units. The BAS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, humidity, heating water loop temperatures, and chilled water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

The site staff expressed an interest in expanding the level of control provided by the BAS, upgrading the BAS, and receiving additional training on operating the BAS.



BAS Name

BAS Schedule



BAS System Diagram

2.9 Domestic Hot Water

Hot water is produced by two, 300-gallon, 300 MBh gas-fired water heaters and two, 100-gallon, 199 MBh gas-fired storage water heaters with thermal efficiencies of 80%.

One fractional hp circulation pump distributes water to end uses. The circulation pump operates continuously.


Storage Tank Water Heaters


Storage Tank Water Heaters


DHW Circulation Pump

2.10 Food Service Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare meals for students. Most cooking is done using gas-fired ovens. Bulk prepared foods are held in an electric holding cabinet. Equipment is not high efficiency and is in fair condition.

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

Gas-fired Oven

Steam Table

Electric Food Holding Cabinet

2.11 Refrigeration

The kitchen has several stand-up refrigerators with solid doors and several refrigerator chests. All equipment is standard and in fair condition. The walk-in refrigerator has an estimated 0.56-ton compressor located above the walk in and a two-fan evaporator. The walk-in medium temperature freezer has a 0.5-ton compressor located above walk in and a three-fan evaporator. The ice machine is an Energy Star® rated model.

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

Walk in Cooler

Stand-up Refrigerator

Ice Machine

2.12 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 167 computer workstations throughout the facility. Plug loads include general cafe and office equipment. There are classroom typical loads such as smart boards, projectors, and fans.

There are several mini refrigerators throughout the building and one residential-style refrigerator. These vary in condition and efficiency.

Refrigerator

Copier

Kiln

2.13 Water-Using Systems

There are 31 restrooms with toilets, and sinks. Faucet flow rates are at 0.5 gallons per minute (gpm) or higher. Girl's and boy's locker rooms are infrequently used.

Kitchen Sink

Large Restroom Sink

Individual Restroom Sink

2.14 On-Site Generation

Lincoln Avenue School has a photovoltaic (PV) array with 459 panels that was installed in 2010. This system provides approximately 1.5% of the electricity used. The system appears to be missing some panels and usage was irregular during reported period.

Lincoln Avenue School has an emergency generator that, in the event of a power outage, serves critical services (lighting, elevator, heating - boiler and pumps) and is only used for emergency needs.

Solar Arrays

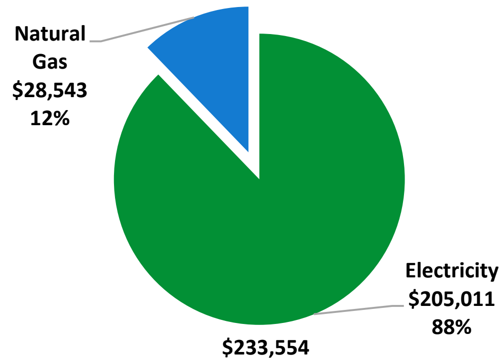
Meter

Inverters

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	1,596,398 kWh	$205,011
Natural Gas	29,262 Therms	$28,543
Total		**$233,554**



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.

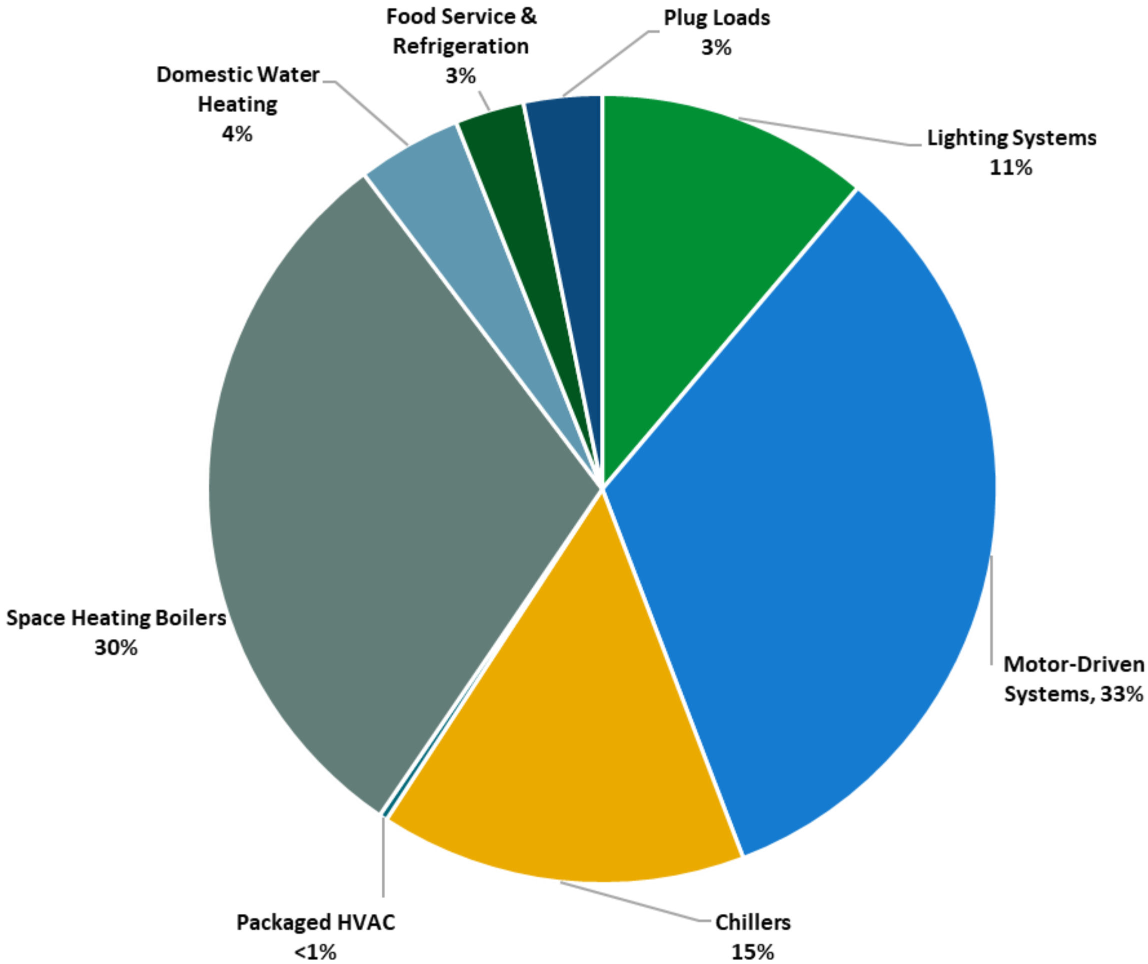
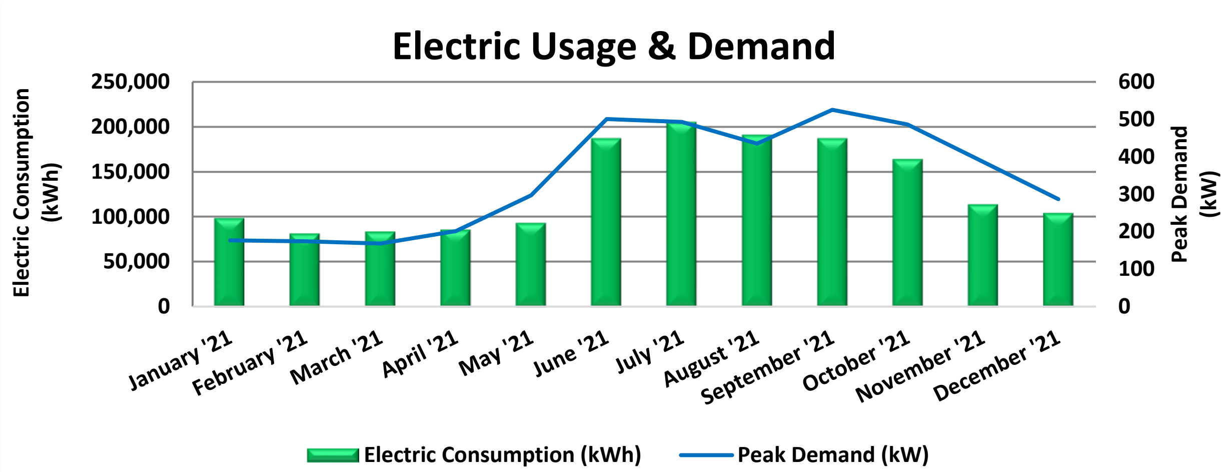


Figure 4 - Energy Balance

3.1 Electricity

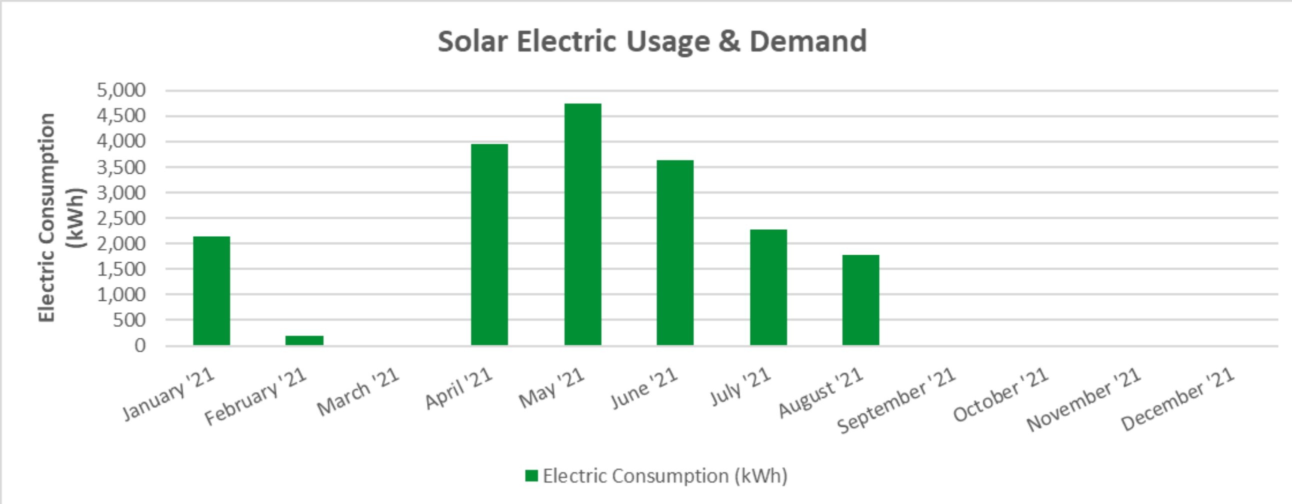
PSE&G delivers electricity under Large Power & Lighting Secondary rate class.



Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
1/31/21	31	98,687	177	664	14,062
2/28/21	28	81,540	174	656	12,810
3/31/21	31	83,704	168	633	12,376
4/30/21	30	85,943	201	758	13,824
5/31/21	31	93,258	297	1,125	14,310
6/30/21	30	187,283	501	6,403	24,777
7/31/21	31	205,348	493	5,875	25,324
8/31/21	31	191,029	435	5,567	23,966
9/30/21	30	187,240	525	6,720	22,747
10/31/21	31	164,002	487	1,842	16,919
11/30/21	30	114,000	387	1,466	11,400
12/31/21	31	104,363	287	1,086	12,495
Totals	**365**	**1,596,398**	**525**	**$32,795**	**$205,011**
Annual	**365**	**1,596,398**	**525**	**$32,795**	**$205,011**

Notes:

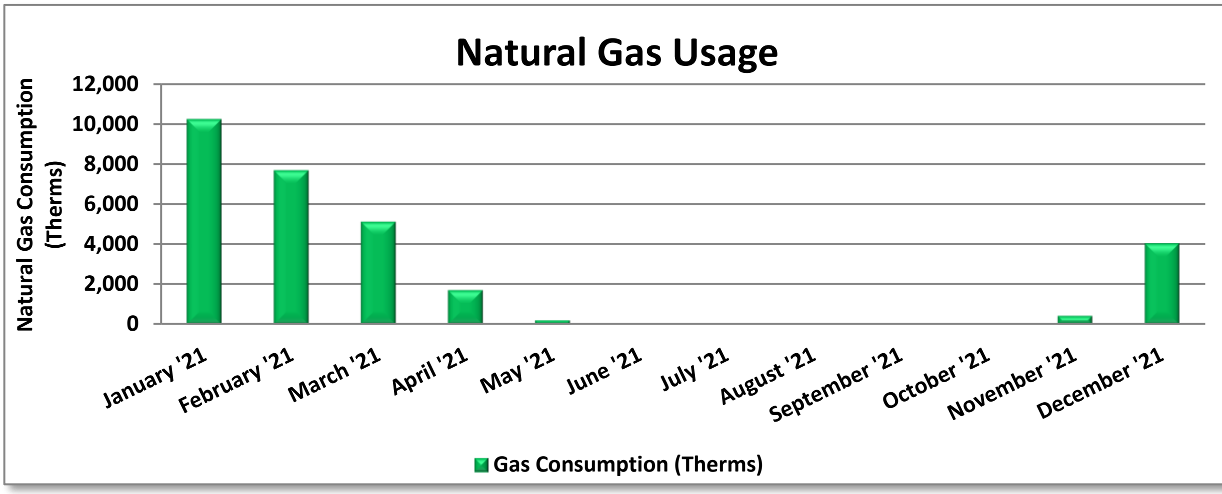
- Peak demand of 525 kW occurred in September 2021.
- Average demand over the past 12 months was 344 kW.
- The average electric cost over the past 12 months was $0.128/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.
- All the electricity generated on-site is used on-site.



Solar Billing Data			
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Total Electric Cost**
1/31/21	31	2,137	$339
2/28/21	28	186	$30
3/31/21	31	0	$0
4/30/21	30	3,952	$634
5/31/21	31	4,750	$762
6/30/21	30	3,630	$582
7/31/21	31	2,281	$366
8/31/21	31	1,783	$286
9/30/21	30	0	$0
10/31/21	31	0	$0
11/30/21	30	0	$0
12/31/21	31	0	$0
Totals	**365**	**18,720**	**$2,999**
Annual	**365**	**18,720**	**$2,999**

3.2 Natural Gas

PSE&G delivers natural gas under Large Volume Gas rate class.



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
1/21/21	34	10,216	$7,898
2/19/21	29	7,671	$5,907
3/22/21	31	5,126	$4,966
4/21/21	30	1,714	$1,297
5/20/21	29	215	$294
6/21/21	32	0	$156
7/21/21	30	0	$158
8/19/21	29	0	$158
9/20/21	32	0	$158
10/19/21	29	0	$158
11/17/21	29	437	$1,924
12/20/21	33	4,042	$5,628
Totals	**367**	**29,422**	**$28,699**
Annual	**365**	**29,262**	**$28,543**

Notes:

- The average gas cost for the past 12 months is $0.975/therm, which is the blended rate used throughout the analysis.

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	37

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

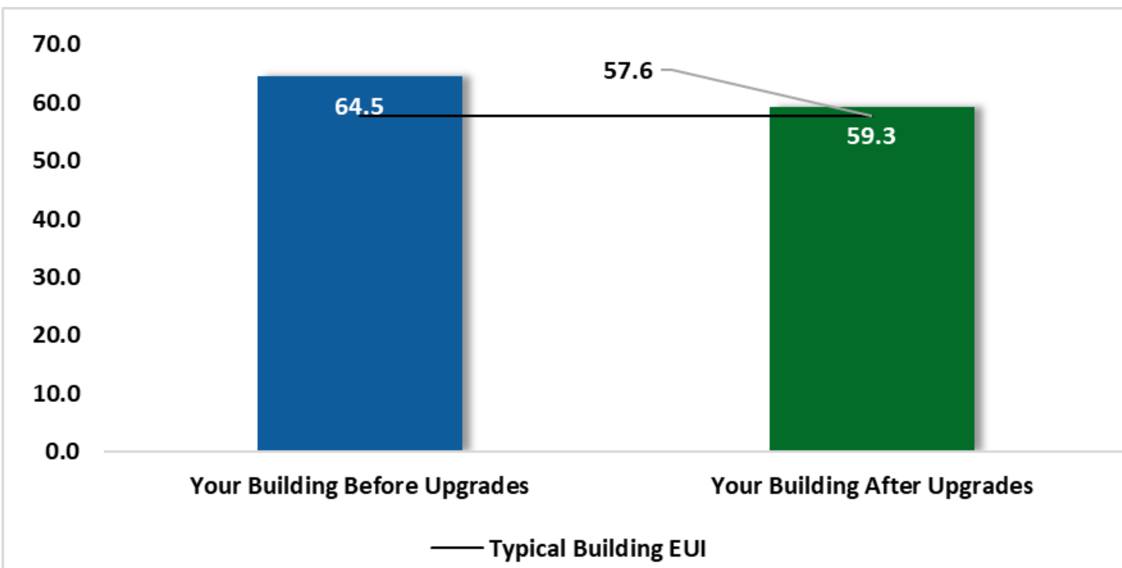


Figure 5 - Energy Use Intensity Comparison[3]

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 monthly 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			**183,347**	**53.3**	**-32**	**$23,230**	**$113,009**	**$19,833**	**$93,176**	**4.0**	**180,837**
ECM 1	Install LED Fixtures	Yes	51,455	7.3	-5	$6,560	$34,564	$5,700	$28,864	4.4	51,242
ECM 2	Retrofit Fixtures with LED Lamps	Yes	131,892	46.0	-27	$16,669	$78,445	$14,133	$64,312	3.9	129,595
Lighting Control Measures			**15,043**	**4.9**	**-3**	**$1,901**	**$31,259**	**$8,245**	**$23,014**	**12.1**	**14,780**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	11,534	3.8	-2	$1,458	$24,284	$2,985	$21,299	14.6	11,332
ECM 4	Install High/Low Lighting Controls	Yes	3,510	1.1	-1	$444	$6,975	$5,260	$1,715	3.9	3,448
Variable Frequency Drive (VFD) Measures			**7,818**	**2.2**	**0**	**$1,004**	**$5,945**	**$1,000**	**$4,945**	**4.9**	**7,873**
ECM 5	Install VFDs on Kitchen Hood Fan Motors	Yes	7,818	2.2	0	$1,004	$5,945	$1,000	$4,945	4.9	7,873
Domestic Water Heating Upgrade			**0**	**0.0**	**1**	**$8**	**$29**	**$8**	**$21**	**2.7**	**92**
ECM 6	Install Low-Flow DHW Devices	Yes	0	0.0	1	$8	$29	$8	$21	2.7	92
Food Service & Refrigeration Measures			**2,834**	**0.2**	**0**	**$364**	**$4,865**	**$350**	**$4,515**	**12.4**	**2,854**
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,307	0.2	0	$168	$1,517	$200	$1,317	7.8	1,316
ECM 8	Refrigeration Controls	No	1,527	0.1	0	$196	$3,348	$150	$3,198	16.3	1,538
TOTALS			**209,043**	**60.7**	**-35**	**$26,506**	**$155,107**	**$29,436**	**$125,671**	**4.7**	**206,436**

* - 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		**183,347**	**53.3**	**-32**	**$23,230**	**$113,009**	**$19,833**	**$93,176**	**4.0**	**180,837**
ECM 1	Install LED Fixtures	51,455	7.3	-5	$6,560	$34,564	$5,700	$28,864	4.4	51,242
ECM 2	Retrofit Fixtures with LED Lamps	131,892	46.0	-27	$16,669	$78,445	$14,133	$64,312	3.9	129,595
Lighting Control Measures		**15,043**	**4.9**	**-3**	**$1,901**	**$31,259**	**$8,245**	**$23,014**	**12.1**	**14,780**
ECM 3	Install Occupancy Sensor Lighting Controls	11,534	3.8	-2	$1,458	$24,284	$2,985	$21,299	14.6	11,332
ECM 4	Install High/Low Lighting Controls	3,510	1.1	-1	$444	$6,975	$5,260	$1,715	3.9	3,448
Variable Frequency Drive (VFD) Measures		**7,818**	**2.2**	**0**	**$1,004**	**$5,945**	**$1,000**	**$4,945**	**4.9**	**7,873**
ECM 5	Install VFDs on Kitchen Hood Fan Motors	7,818	2.2	0	$1,004	$5,945	$1,000	$4,945	4.9	7,873
Domestic Water Heating Upgrade		**0**	**0.0**	**1**	**$8**	**$29**	**$8**	**$21**	**2.7**	**92**
ECM 6	Install Low-Flow DHW Devices	0	0.0	1	$8	$29	$8	$21	2.7	92
Food Service & Refrigeration Measures		**1,307**	**0.2**	**0**	**$168**	**$1,517**	**$200**	**$1,317**	**7.8**	**1,316**
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	1,307	0.2	0	$168	$1,517	$200	$1,317	7.8	1,316
TOTALS		**207,516**	**60.6**	**-35**	**$26,310**	**$151,759**	**$29,286**	**$122,473**	**4.7**	**204,898**

* - 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		**183,347**	**53.3**	**-32**	**$23,230**	**$113,009**	**$19,833**	**$93,176**	**4.0**	**180,837**
ECM 1	Install LED Fixtures	51,455	7.3	-5	$6,560	$34,564	$5,700	$28,864	4.4	51,242
ECM 2	Retrofit Fixtures with LED Lamps	131,892	46.0	-27	$16,669	$78,445	$14,133	$64,312	3.9	129,595

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 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 fixture(s).

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: gymnasium and exterior fixtures.

ECM 2: Retrofit Fixtures with LED Lamps

Replace fluorescent or 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 T5, T5HO, and T8 tubes, and CFL 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		**15,043**	**4.9**	**-3**	**$1,901**	**$31,259**	**$8,245**	**$23,014**	**12.1**	**14,780**
ECM 3	Install Occupancy Sensor Lighting Controls	11,534	3.8	-2	$1,458	$24,284	$2,985	$21,299	14.6	11,332
ECM 4	Install High/Low Lighting Controls	3,510	1.1	-1	$444	$6,975	$5,260	$1,715	3.9	3,448

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, classrooms, gymnasium, library, restrooms, 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 and stairwells.

4.3 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		**7,818**	**2.2**	**0**	**$1,004**	**$5,945**	**$1,000**	**$4,945**	**4.9**	**7,873**
ECM 5	Install VFDs on Kitchen Hood Fan Motors	7,818	2.2	0	$1,004	$5,945	$1,000	$4,945	4.9	7,873

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 5: Install VFDs on Kitchen Hood Fan Motors

Install VFDs and sensors to control the kitchen hood fan motor(s). The air flow of the hood is varied based on two key inputs: temperature and smoke/cooking fumes. The VFD controls the amount of exhaust (and kitchen make-up air) based on temperature—the lower the temperature the lower the flow. If the optic sensor is triggered by smoke or cooking fumes, the speed of the fan ramps up to 100%.

Energy savings result from reducing the hood fan speed (and power) when conditions allow for reduced air flow.

4.4 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		**0**	**0.0**	**1**	**$8**	**$29**	**$8**	**$21**	**2.7**	**92**
ECM 6	Install Low-Flow DHW Devices	0	0.0	1	$8	$29	$8	$21	2.7	92

ECM 6: Install Low-Flow DHW Devices

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

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

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing. Additional cost savings may result from reduced water usage.

4.5 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		**2,834**	**0.2**	**0**	**$364**	**$4,865**	**$350**	**$4,515**	**12.4**	**2,854**
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	1,307	0.2	0	$168	$1,517	$200	$1,317	7.8	1,316
ECM 8	Refrigeration Controls	1,527	0.1	0	$196	$3,348	$150	$3,198	16.3	1,538

ECM 7: Refrigerator/Freezer Case Electrically Commutated Motors

We evaluated replacing shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in walk-ins. Fractional horsepower EC motors are significantly more efficient than mechanically commutated, brushed motors, particularly at low speeds or partial load. By using variable-speed technology, EC motors can optimize fan usage. Because these motors are brushless and use DC power, losses due to friction and phase shifting are eliminated.

Savings for this measure consider both the increased efficiency of the motor as well as the reduction in refrigeration load due to motor heat loss.

ECM 8: Refrigeration Controls

Install additional controls to optimize the operation of walk-in coolers and freezers.

Many walk-in coolers and freezers have evaporator fans that run continuously. The measure adds a control system feature to automatically shut off evaporator fans when not needed.

Energy savings for each of the control measures account for reduction in compressor and fan operating hours as well as reduction in the refrigeration heat load as appropriate.

4.6 Measures for Future Consideration

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

Orange Board of Education 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.

<u>Upgrade/Replace Building Automation System</u>

Based on our site survey and on conversations with facility staff, it appears that the existing building automation system (BAS) is substantially limited in its capabilities, means of control, monitoring/ reporting function, or condition relative to new systems available in the marketplace. A substantial upgrade to your site's BAS could increase the efficiency of your building HVAC system operation.

The current generation BAS typically provides building systems with a network of temperature and pressure sensors that obtain feedback about field conditions and provide signals to control systems to adjust system operation for optimal functioning. Thirty years ago, most control systems were pneumatic systems driven by compressed air, with pneumatic thermostats and air driven actuators for valves and dampers. Pneumatics controls have largely been replaced by direct digital control (DDC) systems, but many pneumatic systems remain. Contemporary DDC systems afford tighter controls and enhanced monitoring and trending capabilities as compared to the older systems.

A controls upgrade would enable automated equipment start and stop times, temperature setpoints, and lockouts and dead bands to be programmed remotely using a graphic interface. Controls can be configured to optimize ventilation and outside air intake by adjusting economizer position, damper function, and fan speed. Existing chilled and hot water distribution system controls are typically tied in, including associated pumps and valves. Coordinated control of HVAC systems is dependent on a network of sensors and status points. A comprehensive building control system provides monitoring and control for all HVAC systems, so operators can adjust system programming for optimal comfort and energy savings.

It is recommended that an HVAC engineer or contractor who specializes in BAS be contacted for a detailed evaluation and implementation costs. A controls expert will be able to tell you to what extent an existing system can be refurbished or expanded, what sensors should be replaced, what additional HVAC systems could be controlled, and what monitoring and graphic capabilities can be added. For the purposes of this report, the potential energy savings and measure costs were estimated based on industry standards and previous project experience. Further analysis should be conducted for the feasibility of this measure. This is not an investment grade analysis, nor should be used as a basis for design and construction.

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[4]. Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Lighting Maintenance

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

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

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.

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

Motor Controls

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Whenever possible, use automatic devices such as twist timers or occupancy sensors to turn off motors when they are not needed.

Motor Short Cycling Reduction

Frequent stopping and starting of motors places substantial stress on rotors and other parts. This leads to wear and tear, lower efficiency, and higher maintenance costs. Adjust the load on the motor to limit the amount of unnecessary stopping and starting to improve motor performance.

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.

Destratification Fans

For areas with high ceilings, destratification fans balance the air temperature from floor to ceiling. They help reduce the recovery time needed to warm the space after nightly temperature setbacks, and they will increase occupants' the comfort level.

Areas with high ceilings require the heating system to heat a larger volume of space than that which is occupied. As the warm air rises, the warmest space is at the ceiling level, rather than floor level. Higher temperatures at the ceiling accelerate heat loss through the roof, which requires additional energy consumption by the heating equipment to compensate for this accelerated heat transfer.

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 5% to 10% 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.

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.

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.

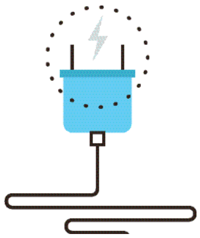
Refrigeration Equipment Maintenance

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 5% and 10% 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.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

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 foundation. Periodically check overnight meter readings when the facility is unoccupied, and there is no other scheduled water usage.

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

Procurement Strategies

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

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

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

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

6 On-site Generation

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

This facility does not appear to meet the minimum criteria for an additional cost-effective solar PV installation. To be cost-effective, a solar PV array needs certain minimum criteria, such as sufficient and sustained electric demand and sufficient flat or south-facing rooftop or other unshaded space on which to place the PV panels.

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

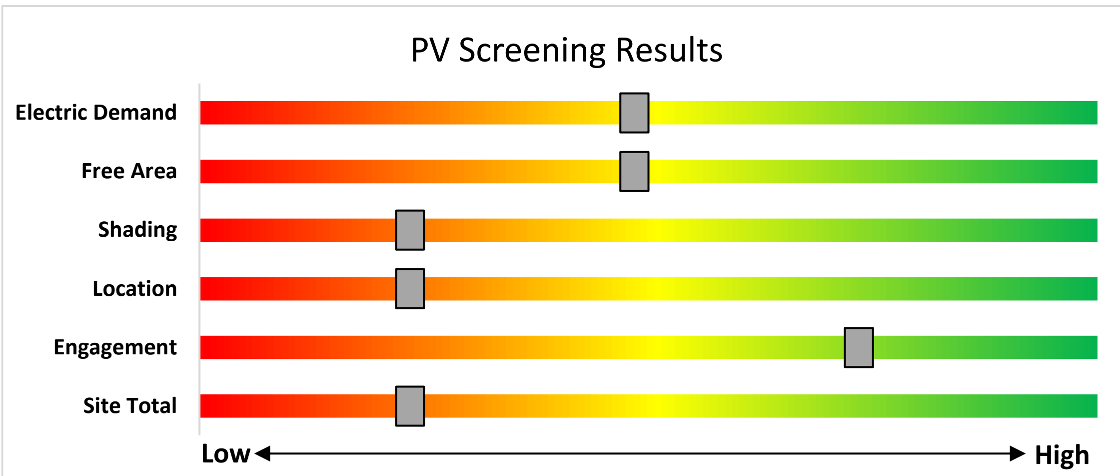


Figure 8 - Photovoltaic Screening

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.

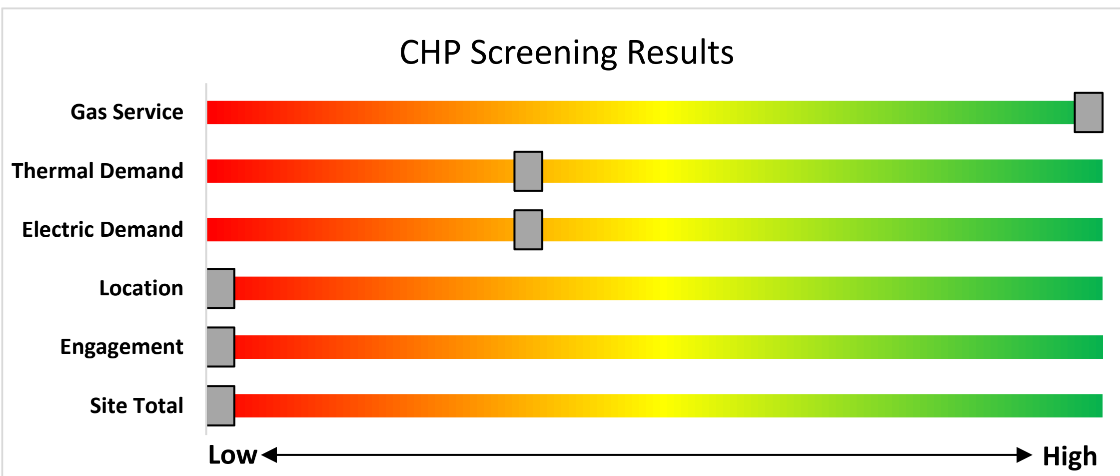


Figure 9 - Combined Heat and Power Screening

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)

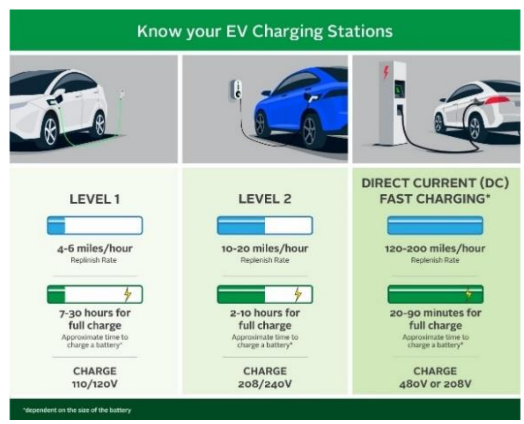
All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes 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 medium 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.

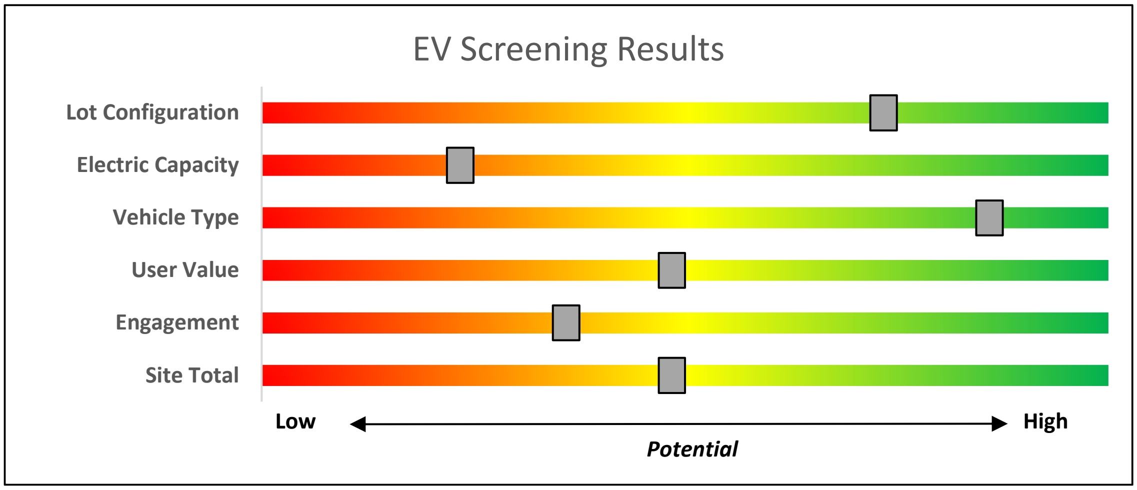


Figure 10 – EV Charger Screening

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	>3 MW	$350		
Fuel Cells with Heat Recovery				
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.

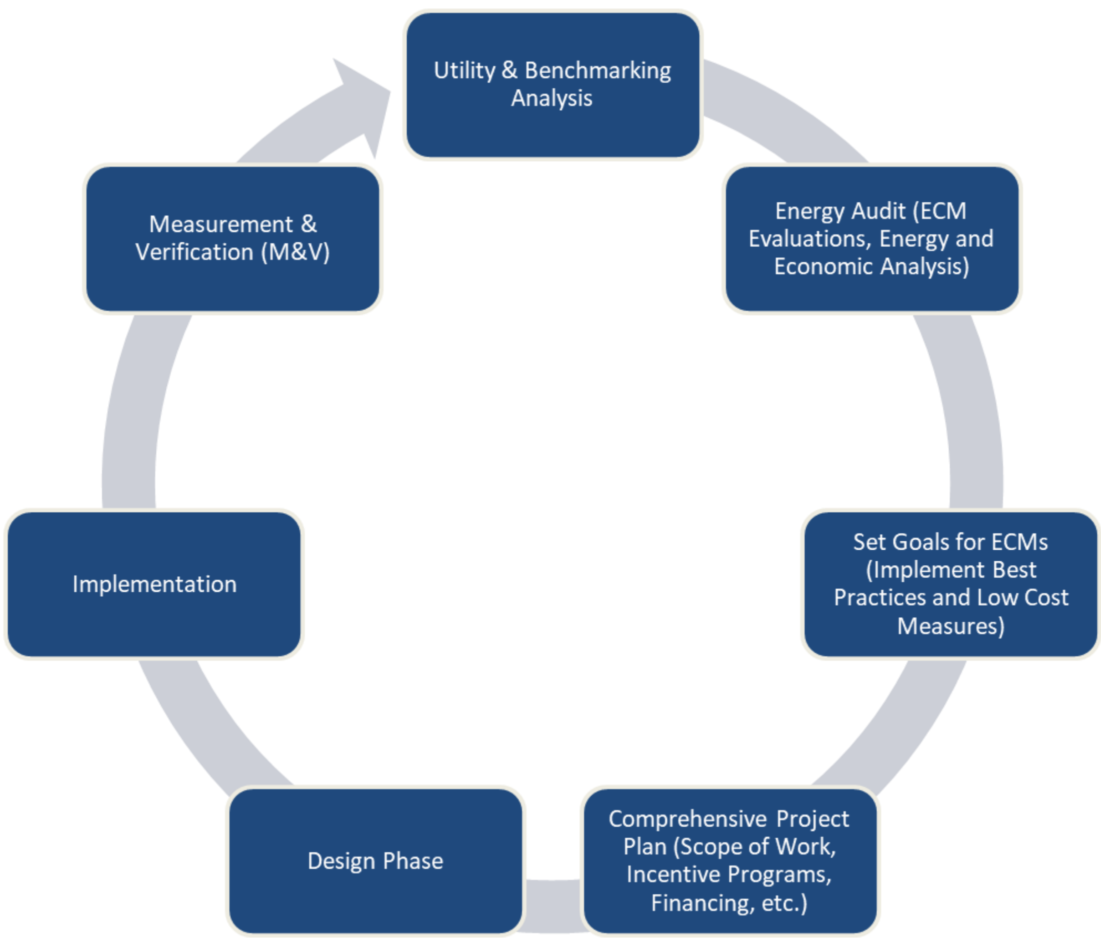


Figure 11 – Project Development Cycle

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
Classroom 108	6	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.2	545	0	$69	$612	$95	7.5
Classroom A101	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.0	91	0	$11	$66	$10	4.8
Classroom A101	14	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.4	1,271	0	$161	$1,069	$175	5.6
Classroom A103	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Wall Switch	21	2,100	0.0	72	0	$9	$50	$10	4.4
Classroom A103	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Classroom A103	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom B101	6	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	6	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.1	331	0	$42	$342	$60	6.8
Classroom B102	6	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.2	545	0	$69	$612	$95	7.5
Classroom B103	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Wall Switch	21	2,100	0.0	72	0	$9	$50	$10	4.4
Classroom B103	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom B103	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom B104	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Wall Switch	21	2,100	0.0	72	0	$9	$50	$10	4.4
Classroom B104	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom B104	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom B205	2	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Occupancy Sensor	S	52	1,670	2	Relamp	No	2	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,670	0.0	114	0	$14	$100	$20	5.6
Classroom B205	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom B205	9	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	9	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.2	496	0	$63	$514	$90	6.8
Classroom C101	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Occupancy Sensor	S	52	1,670	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,670	0.0	57	0	$7	$50	$10	5.6
Classroom C101	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom C101	19	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	19	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	1,047	0	$132	$1,084	$190	6.8
Classroom C103	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Occupancy Sensor	S	52	1,670	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,670	0.0	57	0	$7	$50	$10	5.6
Classroom C103	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom C103	19	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	19	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	1,047	0	$132	$1,084	$190	6.8
Classroom C103 (1)	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Occupancy Sensor	S	52	1,670	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,670	0.0	57	0	$7	$50	$10	5.6
Classroom C103 (1)	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0

	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
Classroom C103 (1)	21	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	21	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.5	1,157	0	$146	$1,198	$210	6.8
Classroom C103 (1)	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Occupancy Sensor	S	52	1,670	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,670	0.0	57	0	$7	$50	$10	5.6
Classroom C103 (1)	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom C103 (1)	19	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	19	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	1,047	0	$132	$1,084	$190	6.8
Classroom C106	2	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Occupancy Sensor	S	52	1,670	2	Relamp	No	2	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,670	0.0	114	0	$14	$100	$20	5.6
Classroom C106	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom C106	18	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	18	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	992	0	$125	$1,027	$180	6.8
Classroom C106 (1)	2	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Occupancy Sensor	S	52	1,670	2	Relamp	No	2	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,670	0.0	114	0	$14	$100	$20	5.6
Classroom C106 (1)	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom C106 (1)	18	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	18	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	992	0	$125	$1,027	$180	6.8
Classroom D106	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
Classroom D106	3	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	3	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.1	165	0	$21	$171	$30	6.8
Classroom D106	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom D110	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Classroom D110	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
Classroom D110	28	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	28	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.6	1,543	0	$195	$1,598	$280	6.8
Classroom D204	24	Linear Fluorescent - RWT8: 4' RWT8 (28W) - 2L	Occupancy Sensor	S	49	1,670	2	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.3	882	0	$111	$876	$240	5.7
Conference A104	9	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.3	817	0	$103	$784	$125	6.4
Corridor 1	16	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 4	Relamp	Yes	16	LED Lamps: (1) 10.5W Plug-In Lamp	High/Low Control	11	1,449	0.2	693	0	$88	$1,075	$640	5.0
Corridor 1	1	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2	Relamp	No	1	LED Lamps: (1) 10.5W Plug-In Lamp	Wall Switch	11	2,100	0.0	36	0	$5	$25	$5	4.4
Corridor 1	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Wall Switch	21	2,100	0.0	72	0	$9	$50	$10	4.4
Corridor 1	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
Corridor 1	7	Linear Fluorescent - T5HO: 4' T5HO (54W) - 2L	Wall Switch	S	117	2,100	2, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' T5HO (25W) Lamps	High/Low Control	51	1,449	0.4	1,323	0	$167	$849	$315	3.2
Dining Area 1	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	3	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.0	130	0	$16	$75	$15	3.7
Dining Area 1	7	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2, 3	Relamp	Yes	7	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,449	0.2	607	0	$77	$620	$105	6.7

	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
Dining Area 1	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
Dining Area 1	18	Incandescent: (11) 50W R16 Screw-In Lamps	Wall Switch	S	550	2,100	2, 3	Relamp	Yes	18	LED Lamps: R16 Lamps	Occupancy Sensor	83	1,449	6.4	20,488	-4	$2,589	$4,500	$466	1.6
Dining Area 1	17	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	17	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.2	772	0	$98	$1,098	$155	9.7
Electrical Room 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,000	0.0	54	0	$7	$55	$15	5.8
Electrical Room 10	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Electrical Room 2	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
Electrical Room 2	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,000	0.2	327	0	$41	$329	$90	5.8
Electrical Room A113	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,000	0.0	54	0	$7	$55	$15	5.8
Electrical Room C100G	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Elevator 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,000	0.0	54	0	$7	$55	$15	5.8
Exterior 2	2	Compact Fluorescent: (2) 42W Biaxial Plug-In Lamps	Timeclock		84	4,380	2	Relamp	No	2	LED Lamps: (2) 18.5W Plug-In Lamps	Timeclock	37	4,380	0.0	412	0	$53	$100	$20	1.5
Exterior 2	6	Metal Halide: (1) 150W Lamp	Timeclock		190	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	45	4,380	0.0	3,811	0	$489	$1,946	$600	2.7
Exterior 2	4	Metal Halide: (1) 150W Lamp	Timeclock		190	4,380	1	Fixture Replacement	No	4	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	45	4,380	0.0	2,540	0	$326	$1,297	$400	2.7
Exterior 2	26	Metal Halide: (1) 150W Lamp	Timeclock		190	4,380	1	Fixture Replacement	No	26	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	45	4,380	0.0	16,513	0	$2,121	$8,431	$2,600	2.7
Exterior 2	10	Metal Halide: (1) 70W Lamp	Timeclock		95	4,380	1	Fixture Replacement	No	10	LED - Fixtures: Bollard Fixture	Timeclock	21	4,380	0.0	3,241	0	$416	$7,174	$500	16.0
Janitorial 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Janitorial B110	1	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	1,000	2	Relamp	No	1	LED Lamps: (1) 10.5W Plug-In Lamp	Wall Switch	11	1,000	0.0	17	0	$2	$14	$1	5.8
Janitorial D102E	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Kitchen D102	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
Kitchen D102	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,449	0.1	203	0	$26	$343	$55	11.2
Kitchen D102	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2, 3	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,449	0.6	2,037	0	$257	$1,037	$245	3.1
Lobby 1	2	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2, 4	Relamp	Yes	2	LED Lamps: (2) 10.5W Plug-In Lamps	High/Low Control	21	1,449	0.1	173	0	$22	$279	$74	9.4
Locker Room D102D	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2, 3	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,449	0.0	145	0	$18	$55	$15	2.2
Locker Room Mens	2	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	2	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.0	87	0	$11	$27	$2	2.3
Locker Room Mens	4	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	173	0	$22	$324	$39	13.0

	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
Locker Room Mens	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
Locker Room Mens	3	Linear Fluorescent - T5: 3' T5 (21W) - 1L	Wall Switch	S	27	2,100	2, 3	Relamp	Yes	3	LED - Linear Tubes: (1) 3' Lamp	Occupancy Sensor	11	1,449	0.0	137	0	$17	$325	$50	15.9
Locker Room Mens	10	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	2,100	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	1,449	0.2	514	0	$65	$803	$95	10.9
Locker Room Mens	5	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.1	227	0	$29	$434	$60	13.0
Locker Room Women	1	Linear Fluorescent - T5: 3' T5 (21W) - 1L	Wall Switch	S	27	2,100	2	Relamp	No	1	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,100	0.0	38	0	$5	$18	$5	2.8
Locker Room Women	2	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	2	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.0	87	0	$11	$143	$22	11.0
Locker Room Women	5	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	5	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	217	0	$27	$338	$40	10.9
Locker Room Women	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
Locker Room Women	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Wall Switch	17	2,100	0.0	39	0	$5	$53	$6	9.5
Locker Room Women	5	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	5	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.1	227	0	$29	$434	$60	13.0
Mechanical 107F	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical 2	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
Mechanical 2	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.2	363	0	$46	$365	$100	5.8
Mechanical 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	73	0	$9	$73	$20	5.8
Mechanical A101	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical A103A	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical A104	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical A109	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical B104A	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical B105A	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical B114	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical C100C	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical C100E (1)	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical C100H	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Mechanical C100H (1)	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0

	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
Multipurpose 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,100	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,100	0.0	152	0	$19	$73	$20	2.8
Multipurpose 1	2	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	2	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.0	87	0	$11	$166	$30	12.4
Multipurpose 1	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Multipurpose 1	7	Incandescent: (1) 65W PAR20 Screw-In Lamp	Wall Switch	S	65	2,100	2, 3	Relamp	Yes	7	LED Lamps: PAR20 Lamps	Occupancy Sensor	10	1,449	0.3	939	0	$119	$424	$49	3.2
Multipurpose 1	77	Incandescent: (1) 65W PAR20 Screw-In Lamp	Wall Switch	S	65	2,100	2, 3	Relamp	Yes	77	LED Lamps: PAR20 Lamps	Occupancy Sensor	10	1,449	3.2	10,334	-2	$1,306	$3,312	$364	2.3
Multipurpose 1	135	Incandescent: (1) 65W PAR30 Screw-In Lamp	Wall Switch	S	65	2,100	2, 3	Relamp	Yes	135	LED Lamps: PAR30 Lamps	Occupancy Sensor	10	1,449	5.6	18,118	-4	$2,290	$5,565	$720	2.1
Multipurpose 1	3	Linear Fluorescent - T5HO: 4' T5HO (54W) - 2L	Wall Switch	S	117	2,100	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' T5HO (25W) Lamps	Occupancy Sensor	51	1,449	0.2	567	0	$72	$441	$65	5.3
Multipurpose 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,100	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,100	0.0	129	0	$16	$73	$20	3.2
Multipurpose 1	30	Metal Halide: (1) 400W Lamp	Wall Switch	S	458	2,100	1, 3	Fixture Replacement	Yes	30	LED - Fixtures: High-Bay	Occupancy Sensor	120	1,449	8.1	26,001	-5	$3,286	$15,215	$1,570	4.2
Office - Enclosed 106A	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Office - Enclosed 106B	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Office - Enclosed 106C	4	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	363	0	$46	$498	$75	9.2
Office - Enclosed 106D	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Office - Enclosed 16	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Office - Enclosed A105A (1)	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,100	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,449	0.1	291	0	$37	$380	$65	8.6
Office - Enclosed A105C	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,100	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,449	0.2	582	0	$74	$489	$95	5.4
Office - Enclosed A105D	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,449	0.1	194	0	$25	$189	$40	6.1
Office - Enclosed A105E	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,100	0.0	76	0	$10	$37	$10	2.8
Office - Enclosed A105E (1)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,100	0.0	76	0	$10	$37	$10	2.8
Office - Enclosed A107A	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Office - Enclosed A107B	2	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2, 3	Relamp	Yes	2	LED Lamps: (2) 10.5W Plug-In Lamps	Occupancy Sensor	21	1,449	0.1	173	0	$22	$170	$24	6.7
Office - Enclosed A107B	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Office - Enclosed B103 Custodian	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,449	0.1	436	0	$55	$434	$80	6.4
Office - Enclosed C105	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,100	0.0	114	0	$14	$55	$15	2.8
Office - Enclosed C108	4	Linear Fluorescent - RWT8: 4' RWT8 (28W) - 2L	Wall Switch	S	49	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,449	0.1	268	0	$34	$416	$75	10.1

	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
Office - Enclosed D102A	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,100	0.0	114	0	$14	$55	$15	2.8
Office - Enclosed Gym A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,449	0.1	291	0	$37	$226	$50	4.8
Office - Enclosed Gym B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,449	0.1	291	0	$37	$226	$50	4.8
Office - Open Plan 105	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	2,100	0.0	17	0	$2	$14	$1	5.7
Office - Open Plan 105	4	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	363	0	$46	$498	$75	9.2
Office - Open Plan 106	2	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2	Relamp	No	2	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	2,100	0.0	35	0	$4	$27	$2	5.7
Office - Open Plan 106	3	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	272	0	$34	$441	$65	10.9
Office - Open Plan 107	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Wall Switch	21	2,100	0.0	72	0	$9	$27	$2	2.8
Office - Open Plan 107	12	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.3	1,089	0	$138	$955	$155	5.8
Restroom - Male 2	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	2,100	0.0	17	0	$2	$14	$1	5.7
Restroom - Male 2	4	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	173	0	$22	$324	$39	13.0
Restroom - Male 2	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Male 2	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Restroom - Male 2 (1)	4	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	1,449	0.0	85	0	$11	$324	$39	26.5
Restroom - Male 2 (1)	4	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	173	0	$22	$324	$39	13.0
Restroom - Male 2 (1)	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Male 2 (1)	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Restroom - Male 2 (1)	5	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2, 3	Relamp	Yes	5	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	1,449	0.0	106	0	$13	$338	$40	22.1
Restroom - Male 2 (1)	4	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	173	0	$22	$324	$39	13.0
Restroom - Male 2 (1)	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Male 2 (1)	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Restroom - Male 7	4	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2	Relamp	No	4	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	2,100	0.0	69	0	$9	$54	$4	5.7
Restroom - Male 7	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Wall Switch	21	2,100	0.0	72	0	$9	$27	$2	2.8
Restroom - Male 7	4	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.1	182	0	$23	$401	$55	15.1
Restroom - Unisex 1	1	Linear Fluorescent - T5: 3' T5 (21W) - 1L	Wall Switch	S	27	2,100	2	Relamp	No	1	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	2,100	0.0	38	0	$5	$18	$5	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
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Restroom - Unisex 1	1	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2	Relamp	No	1	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Wall Switch	15	2,100	0.0	35	0	$4	$33	$5	6.4
Restroom - Unisex 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,100	0.0	114	0	$14	$55	$15	2.8
Restroom - Unisex A107C	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Restroom - Unisex A111	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Restroom - Unisex A112	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Restroom - Unisex B111	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Unisex B112	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Unisex C102 (1)	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Unisex C103	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Unisex C103 (1)	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Unisex Gym	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,449	0.1	291	0	$37	$226	$50	4.8
Storage 107D	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	1,000	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Wall Switch	21	1,000	0.0	34	0	$4	$27	$2	5.8
Storage 107E	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Storage 4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	690	0.1	139	0	$18	$226	$30	11.2
Storage 5	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	690	0.1	185	0	$23	$416	$40	16.1
Storage 7 Gym	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	73	0	$9	$73	$20	5.8
Storage A110	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	690	0.2	346	0	$44	$544	$75	10.7
Storage B104B	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	1,000	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	1,000	0.0	8	0	$1	$14	$1	12.0
Storage D102B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	690	0.1	139	0	$18	$226	$30	11.2
Storage D102F	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,000	0.0	54	0	$7	$55	$15	5.8
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,000	0.0	54	0	$7	$55	$15	5.8
Storage Gym	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	690	0.4	554	0	$70	$708	$120	8.4
Storage Loading Dock	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
Storage Loading Dock	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	690	0.4	554	0	$70	$708	$120	8.4
Storage practice Rm 1-3	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	690	0.2	277	0	$35	$489	$60	12.3

	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
Storage practice Rm 1-3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	690	0.1	92	0	$12	$189	$20	14.5
Storage practice Rm 1-3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	690	0.1	92	0	$12	$189	$20	14.5
Classroom 211	24	Linear Fluorescent - RWT8: 4' RWT8 (28W) - 2L	Occupancy Sensor	S	49	1,670	2	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.3	882	0	$111	$876	$240	5.7
Classroom 211 (1)	24	Linear Fluorescent - RWT8: 4' RWT8 (28W) - 2L	Occupancy Sensor	S	49	1,670	2	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.3	882	0	$111	$876	$240	5.7
Classroom A201	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A201	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom A202	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A202	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A203	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Occupancy Sensor	S	26	1,670	2	Relamp	No	3	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,670	0.0	85	0	$11	$41	$3	3.5
Classroom A203	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A203	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A204	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A204	14	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	14	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.3	772	0	$98	$799	$140	6.8
Classroom A205	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A205	1	Linear Fluorescent - RWT8: 4' RWT8 (28W) - 2L	Occupancy Sensor	S	49	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.0	37	0	$5	$37	$10	5.7
Classroom A208	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A208	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom B203	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom B203	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom B205	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Occupancy Sensor	S	26	1,670	2	Relamp	No	3	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,670	0.0	85	0	$11	$41	$3	3.5
Classroom B205	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom B205	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom B205 (1)	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom B205 (1)	6	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	6	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.1	331	0	$42	$342	$60	6.8
Classroom B206	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0

	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
Classroom B206	16	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	16	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.3	882	0	$111	$913	$160	6.8
Classroom C204	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom C204	1	Linear Fluorescent - RWT8: 4' RWT8 (28W) - 2L	Occupancy Sensor	S	49	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.0	37	0	$5	$37	$10	5.7
Classroom C205	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom C205	18	Linear Fluorescent - RWT8: 4' RWT8 (28W) - 2L	Occupancy Sensor	S	49	1,670	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.3	661	0	$84	$657	$180	5.7
Classroom D202	24	Linear Fluorescent - RWT8: 4' RWT8 (28W) - 2L	Occupancy Sensor	S	49	1,670	2	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.3	882	0	$111	$876	$240	5.7
Conference B204A	8	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.2	726	0	$92	$727	$115	6.7
Corridor 2F	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 4	Relamp	Yes	3	LED Lamps: (1) 10.5W Plug-In Lamp	High/Low Control	11	1,449	0.0	130	0	$16	$266	$108	9.6
Corridor 2F	1	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2	Relamp	No	1	LED Lamps: (1) 10.5W Plug-In Lamp	Wall Switch	11	2,100	0.0	36	0	$5	$14	$1	2.8
Corridor 2F	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
Corridor 2F	5	Linear Fluorescent - T5HO: 4' T5HO (54W) - 2L	Wall Switch	S	117	2,100	2, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' T5HO (25W) Lamps	High/Low Control	51	1,449	0.3	945	0	$119	$510	$225	2.4
Corridor 2R	9	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 4	Relamp	Yes	9	LED Lamps: (1) 10.5W Plug-In Lamp	High/Low Control	11	1,449	0.1	390	0	$49	$572	$324	5.0
Corridor 2R	1	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2	Relamp	No	1	LED Lamps: (1) 10.5W Plug-In Lamp	Wall Switch	11	2,100	0.0	36	0	$5	$14	$1	2.8
Corridor 2R	1	Compact Fluorescent: (1) 32W Biaxial Plug-In Lamp	Wall Switch	S	32	2,100	2	Relamp	No	1	LED Lamps: (1) 23W Biax Lamps	Wall Switch	23	2,100	0.0	21	0	$3	$14	$1	4.8
Corridor 2R	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 2R	20	Linear Fluorescent - T5HO: 4' T5HO (54W) - 2L	Wall Switch	S	117	2,100	2, 4	Relamp	Yes	20	LED - Linear Tubes: (2) 4' T5HO (25W) Lamps	High/Low Control	51	1,449	1.2	3,780	-1	$478	$2,041	$900	2.4
Electrical Room A210	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Electrical Room B207	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Electrical Room C210	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.1	145	0	$18	$146	$40	5.8
Janitorial 3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Library 1	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
Library 1	24	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	24	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.5	1,323	0	$167	$1,370	$240	6.8
Library 1	31	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	31	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.7	1,708	0	$216	$1,769	$310	6.8
Library 1	34	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	34	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.7	1,874	0	$237	$1,940	$340	6.8
Mechanical A209	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	73	0	$9	$73	$20	5.8

	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 - B202	6	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.2	545	0	$69	$612	$95	7.5
Office - B202	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Office - B204B	6	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.2	545	0	$69	$612	$95	7.5
Office - Enclosed C206	6	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.2	545	0	$69	$612	$95	7.5
Office - Enclosed D208	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,670	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.1	242	0	$31	$146	$40	3.5
Office - Enclosed D209	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,670	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,670	0.1	364	0	$46	$219	$60	3.5
Office - Enclosed Library	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,670	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,670	0.3	727	0	$92	$438	$120	3.5
Office - Open Plan B204	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2	Relamp	No	3	LED Lamps: (1) 10.5W Plug-In Lamp	Wall Switch	11	2,100	0.0	107	0	$14	$41	$3	2.8
Office - Open Plan B204	14	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.4	1,271	0	$161	$1,069	$175	5.6
Restroom - Female 1	4	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	173	0	$22	$370	$55	14.4
Restroom - Female 1	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Female 1	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Restroom - Female 3	6	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2, 3	Relamp	Yes	6	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	1,449	0.0	128	0	$16	$351	$41	19.2
Restroom - Female 3	5	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	5	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	217	0	$27	$395	$60	12.2
Restroom - Female 3	4	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.1	182	0	$23	$401	$55	15.1
Restroom - Female 4	6	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2, 3	Relamp	Yes	6	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	1,449	0.0	128	0	$16	$81	$6	4.7
Restroom - Female 4	1	Compact Fluorescent: (2) 26W Biaxial Plug-In Lamps	Wall Switch	S	52	2,100	2	Relamp	No	1	LED Lamps: (2) 10.5W Plug-In Lamps	Wall Switch	21	2,100	0.0	72	0	$9	$50	$10	4.4
Restroom - Female 4	4	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.1	182	0	$23	$131	$20	4.8
Restroom - Male 1	4	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	173	0	$22	$370	$55	14.4
Restroom - Male 1	1	Linear Fluorescent - T5: 3' T5 (21W) - 2L	Wall Switch	S	50	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 3' Lamps	Wall Switch	21	2,100	0.0	67	0	$8	$37	$10	3.1
Restroom - Male 1	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	2,100	0.0	69	0	$9	$57	$10	5.4
Restroom - Male 6	4	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	1,449	0.0	85	0	$11	$54	$4	4.7
Restroom - Male 6	5	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	5	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	217	0	$27	$395	$60	12.2
Restroom - Male 6	4	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.1	182	0	$23	$131	$20	4.8
Restroom - Unisex 3	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3

	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 - Unisex 4	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Restroom - Unisex B204C	1	Linear Fluorescent - T5: 4' T5 (28W) - 3L	Wall Switch	S	90	2,100	2	Relamp	No	1	LED - Linear Tubes: (3) 4' T5 (14.5W) Lamps	Wall Switch	45	2,100	0.0	104	0	$13	$81	$15	5.0
Storage 10	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	690	0.1	139	0	$18	$226	$30	11.2
Storage 11	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Storage 203A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	690	0.1	139	0	$18	$226	$30	11.2
Storage B204	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Wall Switch	30	1,000	0.0	33	0	$4	$57	$10	11.3
Classroom A201	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A201	3	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	3	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.1	165	0	$21	$171	$30	6.8
Classroom A202	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A202	18	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	18	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	992	0	$125	$1,027	$180	6.8
Classroom A203	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A203	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A206	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Occupancy Sensor	S	26	1,670	2	Relamp	No	3	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,670	0.0	85	0	$11	$75	$15	5.6
Classroom A206	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A206	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A207	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A207	18	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	18	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	992	0	$125	$1,027	$180	6.8
Classroom A207	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Occupancy Sensor	S	26	1,670	2	Relamp	No	3	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,670	0.0	85	0	$11	$75	$15	5.6
Classroom A207	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A207	15	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	15	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.3	827	0	$104	$856	$150	6.8
Classroom A208	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A208	18	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	18	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	992	0	$125	$1,027	$180	6.8
Classroom A301	2	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Occupancy Sensor	S	30	1,670	2	Relamp	No	2	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,670	0.0	55	0	$7	$66	$10	8.0
Classroom A301	21	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	21	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.5	1,157	0	$146	$1,198	$210	6.8
Classroom A301	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8

Location	Existing Conditions: Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	Proposed Conditions: ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Energy Impact & Financial Analysis: 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
Classroom A302	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A302	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom A303	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Occupancy Sensor	S	26	1,670	2	Relamp	No	3	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,670	0.0	85	0	$11	$75	$15	5.6
Classroom A303	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A303	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom A304	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A304	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom A305	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A305	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom A306	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom A306	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom A307	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Occupancy Sensor	S	26	1,670	2	Relamp	No	3	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,670	0.0	85	0	$11	$75	$15	5.6
Classroom A307	15	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	15	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.3	827	0	$104	$856	$150	6.8
Classroom A307	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom A308	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom A308	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom B301	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom B301	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom B304	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom B304	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	110	0	$14	$114	$20	6.8
Classroom B306	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom B306	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom C301	23	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	23	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.5	1,268	0	$160	$1,313	$230	6.8
Classroom C301	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom C302	21	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	21	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.5	1,157	0	$146	$1,198	$210	6.8

	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
Classroom C302	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom C303	21	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	21	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.5	1,157	0	$146	$1,198	$210	6.8
Classroom C303	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom C304	18	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	18	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	992	0	$125	$1,027	$180	6.8
Classroom C304	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom C306	4	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	173	0	$22	$324	$39	13.0
Classroom C306	23	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	23	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.5	1,268	0	$160	$1,313	$230	6.8
Classroom C306	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Classroom C307	23	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	23	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.5	1,268	0	$160	$1,313	$230	6.8
Classroom C307	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Computer Lab B305	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Occupancy Sensor	S	26	1,670	2	Relamp	No	3	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,670	0.0	85	0	$11	$41	$3	3.5
Computer Lab B305	18	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	18	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.4	992	0	$125	$1,027	$180	6.8
Computer Lab B305	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	S	60	1,670	2	Relamp	No	1	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,670	0.0	55	0	$7	$57	$10	6.8
Corridor 1	3	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 4	Relamp	Yes	3	LED Lamps: (1) 10.5W Plug-In Lamp	High/Low Control	11	1,449	0.0	130	0	$16	$266	$108	9.6
Corridor 1	10	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 4	Relamp	Yes	10	LED Lamps: (1) 10.5W Plug-In Lamp	High/Low Control	11	1,449	0.1	433	0	$55	$585	$360	4.1
Corridor 1	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
Corridor 1	50	Linear Fluorescent - T5HO: 4' T5HO (54W) - 2L	Wall Switch	S	117	2,100	2, 4	Relamp	Yes	50	LED - Linear Tubes: (2) 4' T5HO (25W) Lamps	High/Low Control	51	1,449	2.9	9,449	-2	$1,194	$4,879	$2,250	2.2
Electrical Room 305A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Electrical Room A311	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,000	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,000	0.0	54	0	$7	$55	$15	5.8
Electrical Room B303	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	73	0	$9	$73	$20	5.8
Janitorial B310	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	36	0	$5	$37	$10	5.8
Mechanical 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.1	145	0	$18	$146	$40	5.8
Mechanical 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	73	0	$9	$73	$20	5.8
Mechanical 311	1	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	1,000	2	Relamp	No	1	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Wall Switch	15	1,000	0.0	17	0	$2	$33	$5	13.3
Office - Enclosed 304B	4	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	363	0	$46	$498	$75	9.2

	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 - Enclosed B302A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,449	0.1	388	0	$49	$416	$75	7.0
Office - Enclosed B302B	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,449	0.1	388	0	$49	$416	$75	7.0
Office - Open Plan B312	3	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	272	0	$34	$441	$65	10.9
Office - Open Plan C302	4	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	363	0	$46	$498	$75	9.2
Office - Open Plan C302	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	S	60	2,100	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' T5 (14.5W) Lamps	Occupancy Sensor	30	1,449	0.1	182	0	$23	$230	$40	8.3
Restroom - Female 2	6	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2, 3	Relamp	Yes	6	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	1,449	0.0	128	0	$16	$351	$41	19.2
Restroom - Female 2	5	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	5	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	217	0	$27	$395	$60	12.2
Restroom - Female 2	4	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.1	182	0	$23	$401	$55	15.1
Restroom - Male 5	4	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch	S	13	2,100	2, 3	Relamp	Yes	4	LED Lamps: (1) 5.5W Plug-In Lamp	Occupancy Sensor	6	1,449	0.0	85	0	$11	$324	$39	26.5
Restroom - Male 5	5	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2, 3	Relamp	Yes	5	LED Lamps: (1) 10.5W Plug-In Lamp	Occupancy Sensor	11	1,449	0.1	217	0	$27	$395	$60	12.2
Restroom - Male 5	4	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Occupancy Sensor	15	1,449	0.1	182	0	$23	$401	$55	15.1
Restroom - Unisex 312A	1	Compact Fluorescent: (1) 26W Biaxial Plug-In Lamp	Wall Switch	S	26	2,100	2	Relamp	No	1	LED Lamps: (1) 10.5W Plug-In Lamp	Wall Switch	11	2,100	0.0	36	0	$5	$25	$5	4.4
Restroom - Unisex 312A	1	Linear Fluorescent - T5: 4' T5 (28W) - 1L	Wall Switch	S	30	2,100	2	Relamp	No	1	LED - Linear Tubes: (1) 4' T5 (14.5W) Lamp	Wall Switch	15	2,100	0.0	35	0	$4	$33	$5	6.4
Server Room 1 A310	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	690	0.1	92	0	$12	$189	$40	12.8
Storage 302A	1	Linear Fluorescent - T5: 4' T5 (28W) - 3L	Wall Switch	S	90	1,000	2	Relamp	No	1	LED - Linear Tubes: (3) 4' T5 (14.5W) Lamps	Wall Switch	45	1,000	0.0	50	0	$6	$81	$15	10.6
Storage C302A	1	Linear Fluorescent - T5: 4' T5 (28W) - 3L	Wall Switch	S	90	1,000	2	Relamp	No	1	LED - Linear Tubes: (3) 4' T5 (14.5W) Lamps	Wall Switch	45	1,000	0.0	50	0	$6	$81	$15	10.6
Mechanical 4 Attic C	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Mechanical 4 Attic C	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	690	0.2	277	0	$35	$489	$95	11.3
Mechanical 5 Attic A	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
Mechanical 5 Attic A	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	690	0.2	323	0	$41	$526	$105	10.3
Exterior 1	2	Metal Halide: (1) 250W Lamp	Timeclock		295	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	75	4,380	0.0	1,927	0	$247	$941	$100	3.4
Stairs 1 NW	3	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch		13	2,100	2, 4	Relamp	Yes	3	LED Lamps: (1) 5.5W Plug-In Lamp	High/Low Control	6	1,449	0.0	64	0	$8	$266	$108	19.5
Stairs 1 NW	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,100	2, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,449	0.1	291	0	$37	$335	$135	5.4
Stairs 2	10	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch		13	2,100	2, 4	Relamp	Yes	10	LED Lamps: (1) 5.5W Plug-In Lamp	High/Low Control	6	1,449	0.1	213	0	$27	$360	$235	4.7
Stairs 2	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

	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
Stairs 3	7	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch		13	2,100	2, 4	Relamp	Yes	7	LED Lamps: (1) 5.5W Plug-In Lamp	High/Low Control	6	1,449	0.0	149	0	$19	$320	$232	4.7
Stairs 4	9	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch		13	2,100	2, 4	Relamp	Yes	9	LED Lamps: (1) 5.5W Plug-In Lamp	High/Low Control	6	1,449	0.1	191	0	$24	$347	$234	4.7
Stairs 5	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch		13	2,100	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	2,100	0.0	17	0	$2	$14	$1	5.7
Stairs 6	1	Compact Fluorescent: (1) 13W Biaxial Plug-In Lamp	Wall Switch		13	2,100	2	Relamp	No	1	LED Lamps: (1) 5.5W Plug-In Lamp	Wall Switch	6	2,100	0.0	17	0	$2	$14	$1	5.7
Stairs 6	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

Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions: Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	Proposed Conditions: ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Energy Impact & Financial Analysis: 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 2	Lincoln Ave School	2	Chilled Water Pump	50.0	94.5%	Yes	Weg	050180T3E326T	W	3,000		No	94.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Lincoln Ave School	3	Chilled Water Pump	25.0	93.6%	No	Weg	025180T3E284T	W	2,000		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2	Mechanical 2	1	Exhaust Fan	1.0	70.0%	Yes	Unknown	Unknown	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Lincoln Ave School	2	Exhaust Fan	0.3	65.0%	No	Penn Barry	FX12BHFT	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Lincoln Ave School	2	Exhaust Fan	0.5	65.0%	No	Penn Barry	DX14B	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Lincoln Ave School	1	Exhaust Fan	7.5	91.0%	No	Penn Barry	D22	W	3,391	5	No	91.0%	Yes	1	2.2	7,818	0	$1,004	$5,945	$1,000	4.9
Exterior 1	Lincoln Ave School	2	Exhaust Fan	0.1	65.0%	No	Penn Barry	FX10R	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2	Lincoln Ave School	2	Heating Hot Water Pump	15.0	93.0%	Yes	Weg	015180T3E254T	W	2,190		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Lincoln Ave School	3	Heating Hot Water Pump	30.0	94.1%	Yes	Weg	030180T3E286TS	W	2,190		No	94.1%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Lincoln Ave School	1	DHW Circulation Pump	0.5	70.0%	No	US Motors	Unknown	W	8,760		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Elevator 1	Elevator	1	Other	40.0	78.5%	No	US Motors	EZ40S1BZ	W	75		No	78.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1/2	Lincoln Ave School	2	Other	0.5	70.0%	No	Leeson	102907	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Multipurpose Rm	Multipurpose Rm	7	Other	0.3	65.0%	No	Unknown	Unknown	W	200		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2	Lincoln Ave School	2	Process Blower	1.5	86.5%	No	Unknown	Unknown	W	50		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2	Mechanical and Corridor	1	Supply Fan	7.5	91.0%	Yes	Baldor	EM3311T	W	3,391		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 4 Attic C	Lincoln Ave School	2	Supply Fan	2.0	88.5%	No	Baldor	EM3157T	W	2,745		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 4 Attic C	Lincoln Ave School	2	Supply Fan	1.0	85.5%	No	Baldor	EM3116T	W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Lincoln Ave School	Lincoln Ave School	1	Supply Fan	1.0	70.0%	No	Baldor	Unknown	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 4 Attic A	Lincoln Ave School	2	Supply Fan	3.0	89.5%	No	Baldor	M1207T	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 4 Attic A	Lincoln Ave School	2	Supply Fan	1.5	86.5%	No	Baldor	M1205T	W	2,745		No	86.5%	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
Exterior 1	Lincoln Ave School	1	Supply Fan	10.0	91.7%	No	Reliance Electric	P21G7403R	W	3,391		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Lincoln Ave School	1	Supply Fan	15.0	93.0%	Yes	Baldor	EHM2523T	W	3,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Cafeteria	1	Supply Fan	25.0	94.1%	Yes	Baldor	EHM2531T	W	3,000		No	94.1%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Cafeteria	1	Return Fan	7.5	91.7%	Yes	Baldor	EHM3311T	W	3,000		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Lincoln Ave School	1	Supply Fan	15.0	93.0%	Yes	Baldor	EHM2523T	W	3,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Lincoln Ave School	1	Return Fan	7.5	91.7%	Yes	Baldor	EHM3311T	W	3,000		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Library	1	Supply Fan	15.0	93.0%	Yes	Baldor	EHM2523T	W	3,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Library	1	Return Fan	10.0	91.7%	Yes	Baldor	EHM3313T	W	3,000		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Lincoln Ave School	1	Supply Fan	20.0	93.0%	Yes	Baldor	EHM2515T	W	3,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Lincoln Ave School	1	Return Fan	10.0	91.7%	Yes	Baldor	EHM3313T	W	3,000		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 4 Attic C	Lincoln Ave School	2	Supply Fan	20.0	93.0%	Yes	Baldor	EHM2515T	W	3,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 4 Attic C	Lincoln Ave School	2	Return Fan	10.0	91.7%	Yes	Baldor	EHM3313T	W	3,000		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 5 Attic A	Lincoln Ave School	1	Supply Fan	15.0	93.0%	Yes	Baldor	EHM2523T	W	3,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 5 Attic A	Lincoln Ave School	1	Return Fan	7.5	91.7%	Yes	Baldor	EHM3311T	W	3,000		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Lincoln Ave School	Lincoln Ave School	5	Supply Fan	0.1	65.0%	No	Vairied	Varied	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical	Fan Coil Unit	16	Supply Fan	1.0	70.0%	No	Baldor	M1204T/M3116T	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical	Fan Coil Unit	20	Supply Fan	0.1	65.0%	No	Fasco	Varied	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0

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
Exterior 1	Server Room	1	Split-System	5.00		10.00		Data Aire	DARC-0512	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
Exterior 1	Lincoln Ave School	2	Air-Cooled Screw Chiller	300.00	Trane	RTAC 3004 UR0N UAFN W1WY 1CDL NNGE A11B R0EX	W		No							0.0	0	0	$0	$0	$0	0.0

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 2	Lincoln Ave School	3	Non-Condensing Hot Water Boiler	1,720	Aerco	Benchmark 2.0	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Lincoln Ave School	3	Non-Condensing Hot Water Boiler	1,290	Aerco	Benchmark 1.5	W		No						0.0	0	0	$0	$0	$0	0.0

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 2	Lincoln Ave School	2	Storage Tank Water Heater (> 50 Gal)	AO Smith	BTP-300	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical 1	Lincoln Ave School	2	Storage Tank Water Heater (> 50 Gal)	AO Smith	BTR-197 118	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
Lincoln Ave School	6	4	Faucet Aerator (Kitchen)	2.20	1.50	0.0	0	1	$8	$29	$8	2.7

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Manufacturer	Model	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	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
Kitchen D102	1	Cooler (35F to 55F)	Heatcraft	LSC090AEWMC2K	7, 8	Yes	No	Yes	0.1	1,179	0	$151	$2,281	$155	14.0
Kitchen D102	1	Medium Temp Freezer (0F to 30F)	Heatcraft	Unknown	7, 8	Yes	No	Yes	0.1	1,655	0	$213	$2,584	$195	11.2

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 1	2	Refrigerator Chest	Unknown	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Dining Area 1	2	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	TRUE	TR1R-1S	No		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker 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
Kitchen D102	1	Ice Making Head (≥450 lbs/day), Batch	Manitowoc	SD0502A	No		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	Manufacturer	Model	High Efficiency Equipement?	ECM #	Install High Efficiency 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 1	1	Insulated Food Holding Cabinet (3/4 Size)	FEW	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen D102	1	Gas Rack Oven (Double)	Auto-Shaam	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen D102	1	Gas Rack Oven (Single)	Combitherm	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Dining Area 1	2	Electric Steamer	Unknown	Unknown	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
Storage 107D	1	Washer	1,000	No	Whirlpool	Unknown
Lincoln Ave School	11	Coffee Machine	800	No	Varied	Varied
Lincoln Ave School	167	Desktop	270	No	Varied	Varied
Lincoln Ave School	10	Electric Space Heater	1,500	No	Varied	Varied
Lincoln Ave School	22	Fan	200	No	Varied	Varied
Storage B302A	1	Kiln	11,000	No	Skutt	KM-1027-3
Lincoln Ave School	48	Laptop	200	No	Varied	Varied
Lincoln Ave School	11	Microwave	800	No	Varied	Varied
Lincoln Ave School	81	Printer	200	Yes	Varied	Varied
Lincoln Ave School	3	Copier	1,500	Yes	Canon	ImageRunner
Lincoln Ave School	32	Projector	200	Yes	Unknown	Unknown
Lincoln Ave School	13	Mini Refrigerator	126	No	Varied	Varied
Classroom A103	1	Refrigerator	300	No	Whirlpool	Unknown
Lincoln Ave School	54	Smart Board	200	No	Unknown	Unknown
Lincoln Ave School	2	Television	100	No	Unknown	Unknown
Lincoln Ave School	2	Toaster	700	No	Unknown	Unknown
Conference B204A	1	Toaster Oven	800	No	Unknown	Unknown
Lincoln Ave School	6	Water Cooler	110	Yes	Pure Water Technology	3i-R
Lincoln Ave School	2	Water Fountain	200	No	Elkay	Unknown
Lincoln Ave School	12	Hand Dryer	2,200	No	ASI	0195-00

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.

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ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Lincoln Avenue School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 129,854
Built: 1892

For Year Ending: November 30, 2021
Date Generated: December 14, 2022

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
Lincoln Avenue School 216 Lincoln Avenue Orange, New Jersey 07045	Orange Board of Education 451 Lincoln Avenue Orange, NJ 07050 (973) 677-6000	Jason E. Ballard 451 Lincoln Avenue Orange, NJ 07050 (973) 677-6000 ballarja@orange.k12.nj.us

Property ID: 21694609

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
65.4 kBtu/ft²

Source EUI
140.7 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	5,345,888 (63%)
Natural Gas (kBtu)	3,082,731 (36%)
Electric - Solar (kBtu)	63,871 (1%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	57.6
National Median Source EUI (kBtu/ft²)	124
% Diff from National Median Source EUI	13%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	635

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 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use.
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense™	The symbol for water efficiency. The WaterSense™ program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.