Local Government Energy Audit Report

Orange High School and Prep Academy

March 23, 2023

Prepared for:

Orange Board of Education

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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.

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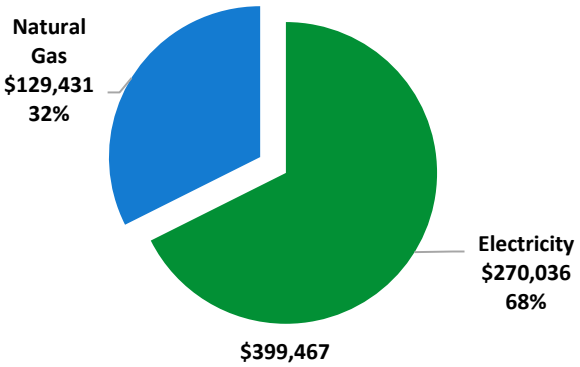
1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Orange High School and Prep Academy. 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: $399,467 Electricity: 2,064,175 kWh Natural Gas: 125,617 Therms	
ENERGY STAR® Benchmarking Score	57 *(1-100 scale)*	Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance, and lower your energy bills even more.

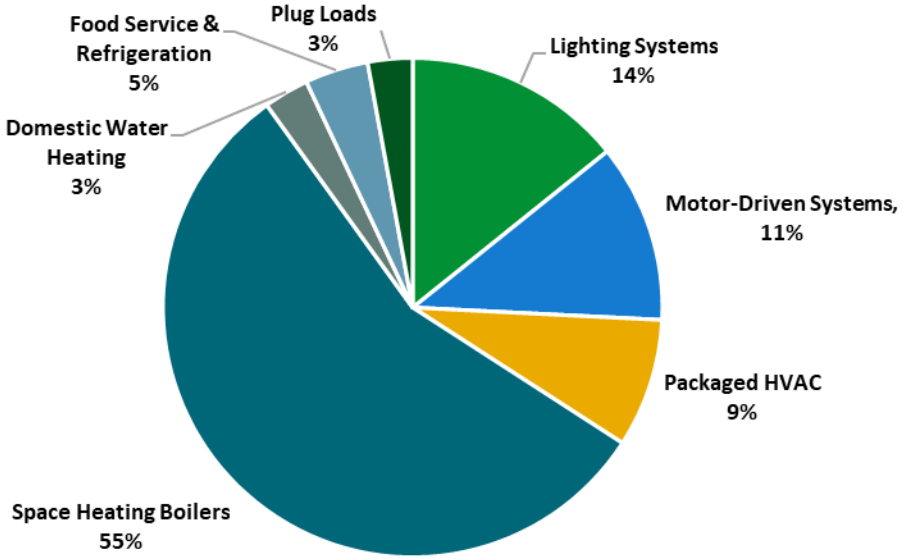


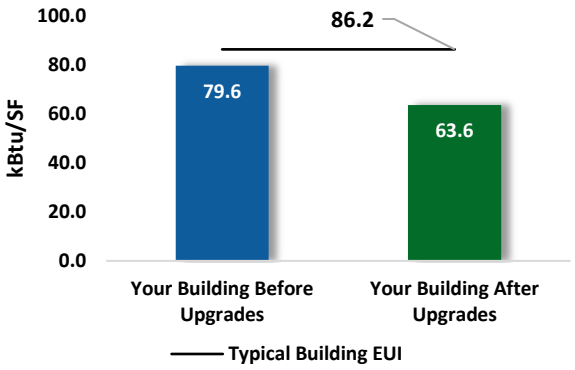
Figure 1 - Energy Use by System

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.

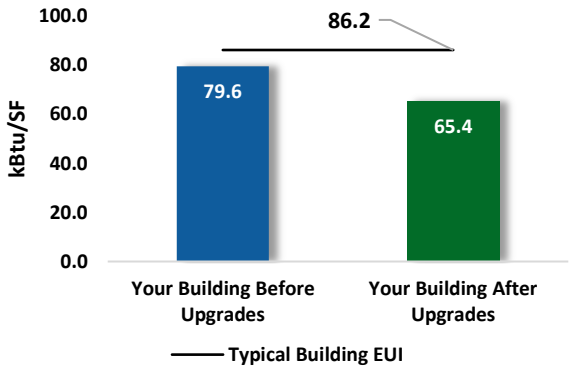
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$659,032
Potential Rebates & Incentives[1]	$77,264
Annual Cost Savings	$107,856
Annual Energy Savings	Electricity: 701,458 kWh Natural Gas: 15,616 Therms
Greenhouse Gas Emission Savings	445 Tons
Simple Payback	5.4 Years
Site Energy Savings (All Utilities)	20%



Scenario 2: Cost Effective Package[2]

Installation Cost	$461,913
Potential Rebates & Incentives	$69,479
Annual Cost Savings	$106,741
Annual Energy Savings	Electricity: 737,049 kWh Natural Gas: 10,016 Therms
Greenhouse Gas Emission Savings	430 Tons
Simple Payback	3.7 Years
Site Energy Savings (all utilities)	18%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on previously run state rebate programs. Contact your utility provider for current program incentives that may apply.

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**417,933**	**75.7**	**-85**	**$53,797**	**$137,508**	**$31,901**	**$105,607**	**2.0**	**410,885**
ECM 1	Install LED Fixtures	Yes	62,932	10.0	-11	$8,118	$25,827	$2,910	$22,917	2.8	62,066
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	30,256	5.8	-6	$3,893	$9,157	$1,372	$7,785	2.0	29,727
ECM 3	Retrofit Fixtures with LED Lamps	Yes	324,745	59.9	-68	$41,786	$102,525	$27,619	$74,906	1.8	319,092
Lighting Control Measures			**115,078**	**20.9**	**-24**	**$14,807**	**$80,343**	**$24,200**	**$56,143**	**3.8**	**113,065**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	88,294	16.8	-18	$11,360	$57,168	$7,260	$49,908	4.4	86,750
ECM 5	Install High/Low Lighting Controls	Yes	26,784	4.1	-6	$3,446	$23,175	$16,940	$6,235	1.8	26,316
Motor Upgrades			**243**	**0.1**	**0**	**$32**	**$1,774**	**$0**	**$1,774**	**55.8**	**245**
ECM 6	Premium Efficiency Motors	No	243	0.1	0	$32	$1,774	$0	$1,774	55.8	245
Variable Frequency Drive (VFD) Measures			**112,537**	**29.1**	**143**	**$16,199**	**$140,399**	**$12,425**	**$127,974**	**7.9**	**130,111**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	83,969	26.3	0	$10,985	$106,912	$7,425	$99,487	9.1	84,556
ECM 8	Install VFDs on Chilled Water Pumps	Yes	9,960	2.8	0	$1,303	$11,890	$2,000	$9,890	7.6	10,030
ECM 9	Install VFDs on Kitchen Hood Fan Motors	Yes	18,608	0.0	143	$3,912	$21,597	$3,000	$18,597	4.8	35,525
Unitary HVAC Measures			**14,598**	**20.9**	**0**	**$1,910**	**$176,091**	**$7,560**	**$168,531**	**88.2**	**14,700**
ECM 10	Install High Efficiency Air Conditioning Units	No	14,598	20.9	0	$1,910	$176,091	$7,560	$168,531	88.2	14,700
HVAC System Improvements			**437**	**0.0**	**10**	**$163**	**$604**	**$90**	**$514**	**3.2**	**1,644**
ECM 11	Install Pipe Insulation	Yes	437	0.0	10	$163	$604	$90	$514	3.2	1,644
Domestic Water Heating Upgrade			**0**	**0.0**	**24**	**$249**	**$366**	**$183**	**$183**	**0.7**	**2,833**
ECM 12	Install Low-Flow DHW Devices	Yes	0	0.0	24	$249	$366	$183	$183	0.7	2,833
Food Service & Refrigeration Measures			**16,895**	**1.8**	**0**	**$2,210**	**$9,215**	**$905**	**$8,310**	**3.8**	**17,013**
ECM 13	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,571	0.2	0	$205	$2,123	$280	$1,843	9.0	1,582
ECM 14	Refrigeration Controls	No	2,087	0.1	0	$273	$5,022	$225	$4,797	17.6	2,102
ECM 15	Vending Machine Control	Yes	13,237	1.5	0	$1,732	$2,070	$400	$1,670	1.0	13,330
Custom Measures			**23,736**	**0.0**	**1,493**	**$18,489**	**$112,732**	**$0**	**$112,732**	**6.1**	**198,715**
ECM 16	Retro-Commissioning Study	Yes	76,256	0.0	933	$19,589	$98,500	$0	$98,500	5.0	186,033
ECM 17	Replace Gas Fired Water Heater with Heat Pump Water Heater	No	-52,520	0.0	560	-$1,100	$14,232	$0	$14,232	-12.9	12,682
TOTALS (COST EFFECTIVE MEASURES)			**737,049**	**127.3**	**1,002**	**$106,741**	**$461,913**	**$69,479**	**$392,434**	**3.7**	**859,483**
TOTALS (ALL MEASURES)			**701,458**	**148.3**	**1,562**	**$107,856**	**$659,032**	**$77,264**	**$581,769**	**5.4**	**889,212**

* - 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).

Negative payback explained in Section 4.9

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 Orange High School and Prep Academy. 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 September 27, 2022, TRC performed an energy audit at Orange High School and Prep Academy located in Orange, New Jersey. TRC met with Edwin Vasquez to review the facility operations and help focus our investigation on specific energy-using systems.

Orange High School and Prep Academy is comprised of two separate buildings, with building area and construction dates provided in the table below. The buildings share domestic hot water, with two of the water heaters serving both the old wing of Orange High School and the Prep Academy. Spaces include classrooms, offices, conference rooms, gymnasiums, locker rooms, auditorium, libraries, cafeterias, kitchens, lounges, corridors, stairwells, restrooms, storage rooms, electrical and mechanical space.

Lighting for the facility is provided mainly by linear fluorescent T8 fixtures. Three chillers and five boilers provide cooling and heating to Orange High School, while three split systems and two boilers provide heating and cooling to Orange Prep Academy. The facility has one gas-fired generator to provide emergency backup electricity to both buildings. There are two passenger elevators located in the facility.

Building Name	Size of Building (Square Feet)	Year Built	# Of Floors
Orange High School	161,314	1974	2
Orange Prep Academy	84,855	1925	3

2.2 Building Occupancy

The facility is fully occupied year-round on weekdays with a typical occupancy of 879 students and 123 staff for Orange High School, and 656 students and 84 staff for Orange Prep Academy. The facility has limited use on the weekends and closes at 10:30 PM on weekdays.

Building Name	Weekday/Weekend	Operating Schedule
Orange High School	Weekday	6:00 AM - 10:30 PM
	Weekend	Limited Use
Orange Prep Academy	Weekday	6:00 AM - 10:30 PM
	Weekend	Limited Use

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a brick facade. The Orange High School roof is flat, covered with a gray membrane, and is in good condition. The Orange Prep Academy roof is a mix of flat areas covered with a gray membrane and pitched areas covered with asphalt shingles and is in fair condition.

The windows are double glazed and have aluminum frames with thermal breaks. The glass-to-frame seals are in good condition. The operable window weather seals are in good condition, showing little evidence of excessive wear. Exterior doors have metal frames and are in fair to good condition with some doors having worn door seals. Degraded window and door seals increase drafts and outside air infiltration. The roof is clad with a mineral-coated, bitumen membrane roofing system. Overall, the building envelope appears in good condition.

Building Walls – Orange High School

Building Walls – Orange Prep Academy

Building Windows – Orange High School

Building Windows – Orange High School

Building Windows – Orange Prep Academy

Building Windows – Orange Prep Academy

Entrance & Exit Doors – Orange High School

Entrance & Exit Doors – Orange High School

Entrance & Exit Doors – Orange Prep Academy

Entrance & Exit Doors – Orange Prep Academy

Roof – Orange High School

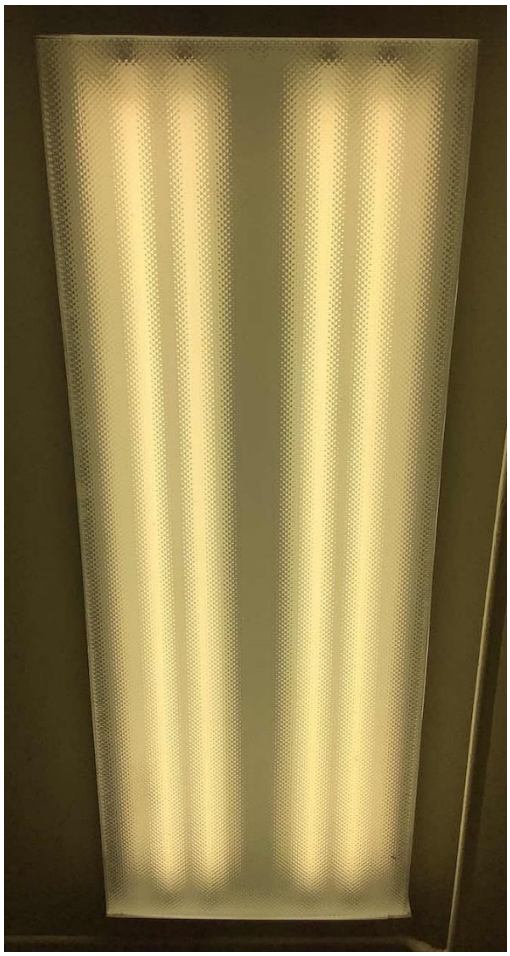
Roof – Orange Prep Academy

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt fluorescent T8 lamps. Fixture types include 1-lamp, 2-lamp, 3-lamp, and 4-lamp, 2-foot and 4-foot long recessed, surface mounted, and pendant fixtures with linear and U-bend tube lamps.

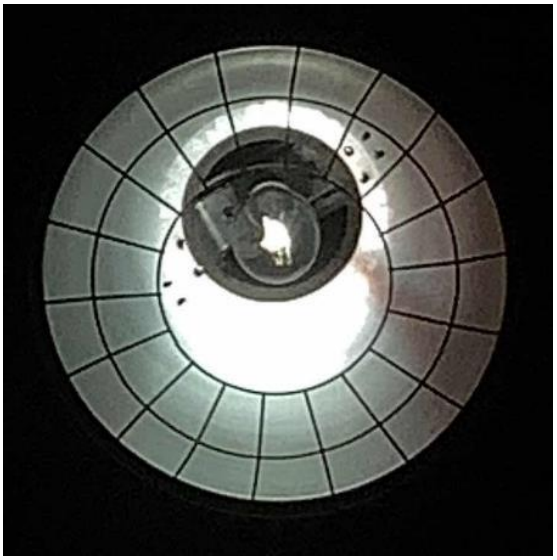
Additionally, incandescent, metal halide (MH), fluorescent T5, fluorescent T12, and LED lamps are also used in some spaces. Typically, incandescent lamps at this facility require 60 Watts, MH lamps draw 400-Watts, fluorescent T5 lamps use 28-Watts, and fluorescent T12 lamps use 40-Watts. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use less efficient magnetic ballasts. All of the exit signs use LED sources. Orange High School gymnasium fixtures have manually controlled high-bay MH and LED lamps; and Orange Prep Academy gymnasium fixtures have occupancy sensor controlled fluorescent T5 lamps. Auditorium fixtures have manually controlled LED fixtures.

Interior light fixtures are primarily controlled by manual wall switches, with occupancy sensors used in some areas of Orange High School. All light fixtures are in good condition. Interior lighting levels were generally sufficient. Orange High School exterior fixtures use LED, HPS, and incandescent lamps; and Orange Prep Academy exterior fixtures use LED and MH lamps. Exterior fixtures are photocell and timer controlled.



Fluorescent T8 Fixtures

Fluorescent T8 Fixtures



Gymnasium High Bay MH Fixture

LED Fixture

Exterior LED & MH Fixtures

Exterior LED & MH Fixtures

2.5 Air Handling Systems

Unit Ventilators

Unit ventilators (UV) are used to condition classrooms and offices throughout Orange High School. These UVs each are equipped with chilled water-cooling coils, hot water heating coils, supply fan motors, and pneumatically controlled outside air dampers. The units are in good condition. The units can be monitored and controlled through the facility's building automation system (BAS).

Unit Ventilator

Unitary Electric HVAC Equipment

Areas of the facility including classrooms and offices are conditioned using mini-split heat pump (HP) units mini-split air conditioning (AC) units, window AC units, and split AC systems. These units range in cooling capacity from 0.4 tons to 28 tons with efficiencies between 8.5 EER and 20 EER. For the mini-split HP units, heating capacities vary from 21 MBh to 52 MBh with heating efficiencies between 10.0 HSPF and 10.6 HSPF. These vary in condition, with some of the older units being recommended for replacement.

Window AC Unit

Mini-split AC & HP Units

Mini-split AC & HP Units

Unitary Heating Equipment

Classroom 103 of Orange High School is heated by a 150 MBh forced air furnace, and some areas of Orange High School are supplementally heated using a total of five electric resistance heaters. The electric resistance heaters range in heating capacity from 3.0 to 7.5 kW. The units are in good condition and are controlled by manual dial thermostats.

Forced Air Furnace

Packaged Rooftop Units (RTUs)

The facility is served by a total of five rooftop packaged units (RTUs). The units provide heating and cooling to spaces as noted below. Units are equipped with gas-fired furnaces and direct expansion (DX) cooling coils. Fans are driven by a mix of constant speed and VFD controlled motors. The Orange High School units are controlled and monitored by the onsite BAS, and the Prep Academy RTU is thermostatically controlled. Refer to Appendix A for detailed information about each unit.

Area Served	Heating Capacity (MBh)	Cooling Capacity (Tons)	VFD Controls	Supply Fan (hp)	Return/Exhaust Fan (hp)
Main Office - HS	65	3.0	No	1.5	1.5
Cafeteria - HS	800	63.0	Yes	25	20
Auxiliary Gym - HS	640	40.0	Yes	15	1
Auxiliary Gym - HS	240	30.0	Yes	15	1
310 Area - PA	93	4.8	No	2	1.5

Packaged Rooftop Unit

Air Handling Units (AHUs)

Areas of the facility are served by air handling units, including the Prep Academy gymnasium, Orange High School main gymnasium, and areas of the Orange High School new wing. The units provide heating to areas of the building, with some providing cooling. Units in Orange High School are equipped with hot water heating coils and some equipped with chilled water-cooling coils, while units in the Prep Academy are equipped with steam heating coils. The units are equipped with a mix of constant speed and VFD controlled supply fans. The Orange High School units are controlled and monitored by the onsite BAS, while the Prep Academy unit is thermostatically controlled.

Air Handling Unit

2.6 Heating Hot Water & Steam Systems

The Orange High School old wing heating system consists of three PK gas-fired condensing boilers, each with an output capacity of 2,375 MBh and nominal efficiency of 95%. The Orange High School new wing heating system consists of two PK gas-fired condensing boilers, each with an output capacity of 1,920 MBh and nominal efficiency of 96%. The burners are fully modulating. The boilers are configured in a lead-lag control scheme and controlled by the facility's BAS. Multiple boilers are required under high load conditions. Installed in 2020, the boilers are in good condition. There is a service contract in place.

The Orange Prep Academy heating system consists of two Easco gas-fired steam boilers, each with an output capacity of 16,738 MBh. The burners are fully modulating with a nominal efficiency of 80%. The boilers are configured in a lead-lag control scheme. Both boilers are required under high load conditions. Installed in 2019, the boilers are in good condition. There is a service contract in place.

The hot water boilers are configured in a variable flow primary distribution with one, 1.5 hp to 2 hp VFD controlled hot water pump connected to each boiler (BP-1 through BP-5) and five, 10 hp VFD controlled hot water pumps (HWP-1 to HWP-5) operating with an automated control scheme for the Orange High School heating hot water loop. A one-pipe steam distribution system serves the Orange Prep Academy heating terminals. There are two, 3 hp boiler feed water pumps and six fractional hp condensate pumps connected to the steam boilers. The boilers provide hot water and steam to the air handling units, unit ventilators, and unit heaters. The hot water boilers' schedules and temperatures are controlled and monitored using the onsite BAS.

Hot Water Boilers

Steam Boilers

Heating Hot Water Pumps

2.7 Chilled Water Systems

The chiller plant consists of two, 91-ton Daikin variable speed, air-cooled scroll chillers serving the Orange High School new wing and one, 100-ton Carrier variable speed, air-cooled scroll chiller serving the Orange High School old wing. The new wing chillers are configured in a primary-secondary distribution loop with two, 7.5 hp VFD controlled primary pumps (CHWP-1 & CHWP-2) and two, 7.5 hp VFD controlled secondary pumps (GCHW-1 & GCHW-2) operating with a lead-lag control scheme for the new wing chilled water loop. The old wing chiller is configured in a primary distribution loop with two, 7.5 hp constant speed chilled water pumps (CHWP-1 & CHWP-2) operating with a lead-lag control scheme for the old wing chilled water loop.

The chillers supply chilled water to air handling units and unit ventilators. The chilled water temperatures and chiller operating schedules are controlled by the onsite BAS. The new wing chillers were installed in 2020 and are in good condition, while the old wing chiller was installed in 2011 and is in fair condition.

Air-cooled Chillers

Chilled Water Pumps

2.8 Building Automation System (BAS)

A BAS controls the HVAC equipment, boilers, chillers, and air handlers for Orange High School. 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 BAS was unavailable for access during the site visit.

2.9 Domestic Hot Water

Hot water for Orange Prep Academy and the old wing of Orange High School is produced by two, 76 MBh gas-fired storage water heaters each with a 75-gallon capacity and a nominal efficiency of 82%. Hot water for the new wing of Orange High School is produced by two, 300 MBh gas-fired storage water heaters each with a 100-gallon capacity and a nominal efficiency of 96%. The units were installed between 2018 and 2019 and are in good condition. Five fractional horsepower circulation pumps distribute water to end uses. Circulation pumps in the Orange High School new wing operate on a clock timer, with the rest operating continuously. The domestic hot water pipes are partially insulated, and the insulation is in good condition.

Water Heaters

Water Heaters

2.10 Food Service Equipment

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

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

Electric Holding Cabinet

Gas-fired Ovens

2.11 Refrigeration

The Orange High School kitchens have 11 stand-up refrigerators with a mix of solid and glass doors, one stand-up freezer with solid doors, and four refrigerator chests. The Orange Prep Academy kitchen has four stand-up refrigerators with solid doors, one stand-up freezer with solid doors, and one refrigerator chest. These vary in efficiency with some ENERGY STAR® rated refrigerators, and all are in good condition.

The walk-in refrigerator has an estimated 0.75-ton compressor and a three-fan evaporator, and the walk-in medium temperature freezer has two, 1.24-ton compressors and two, 2-fan evaporators.

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

Stand-up Refrigerator

Walk-in Refrigerator

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

There are a total of seven residential-style refrigerators in both buildings that are used to store food and drinks. These vary in condition and efficiency. There are eight refrigerated beverage vending machines and one non-refrigerated vending machine. Vending machines are not equipped with occupancy-based controls.

Vending Machine

Residential Style Refrigerator

2.13 Water-Using Systems

There are 37 restrooms and locker rooms with toilets, urinals, showers, and sinks. Some restrooms contained low-flow fixtures, while others had faucet flow rates of 2.2 gallons per minute (gpm) or higher.

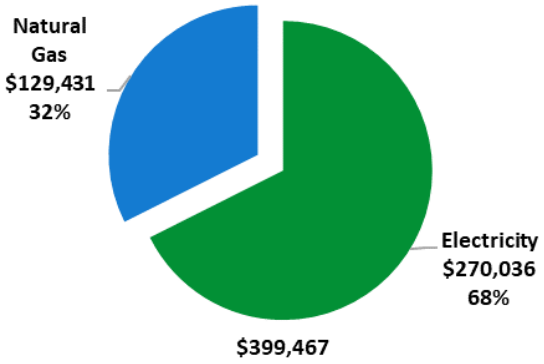
Typical Restroom Sink

Typical Restroom Sink

3 Energy Use and Costs

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

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	2,064,175 kWh	$270,036
Natural Gas	125,617 Therms	$129,431
Total		**$399,467**



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.

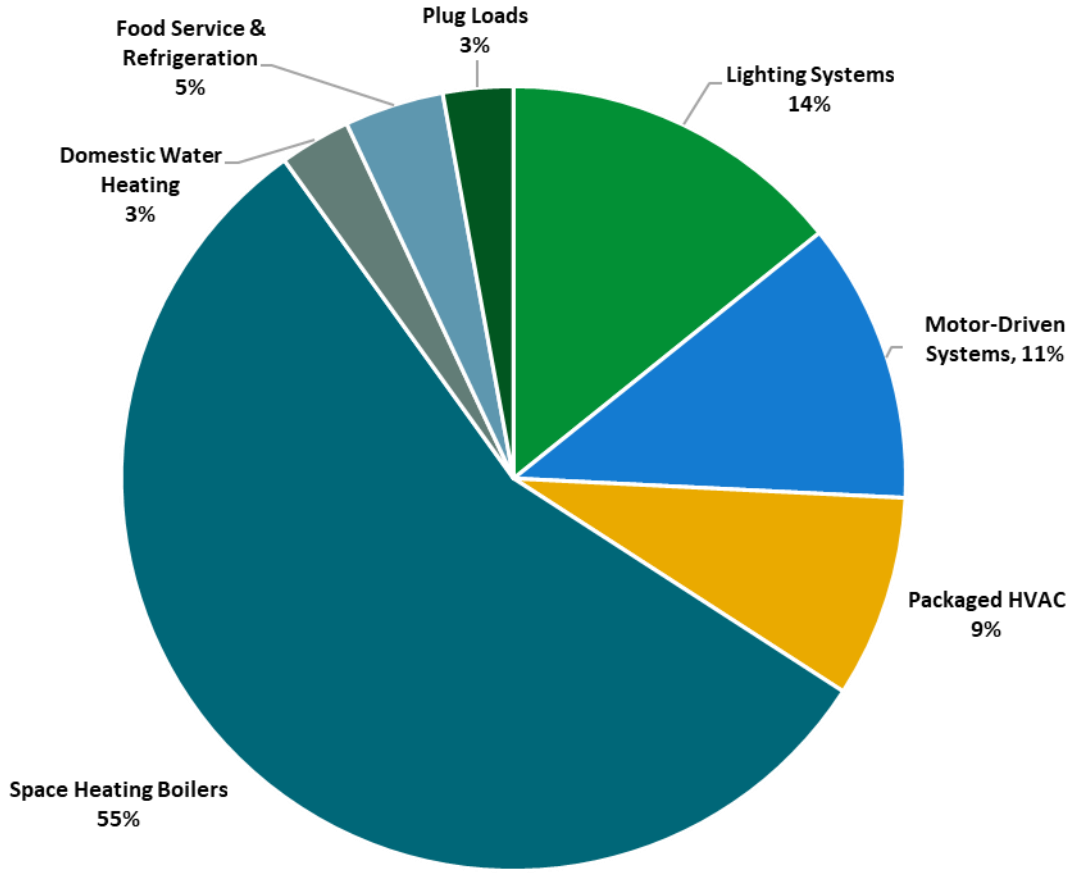
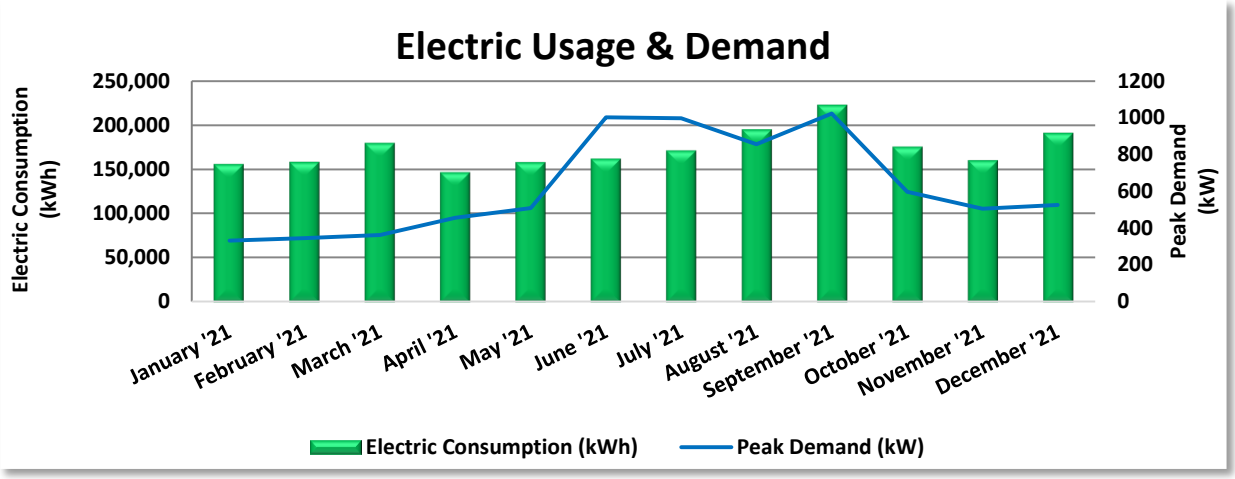


Figure 4 - Energy Balance

3.1 Electricity

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



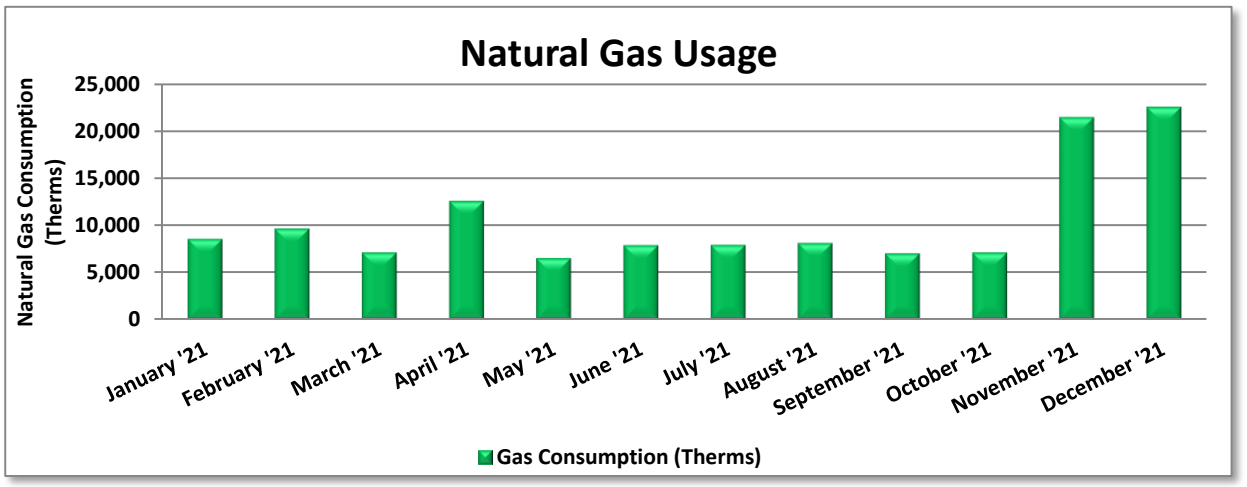
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
1/21/21	34	155,961	332	$1,258	$19,458
2/20/21	30	158,410	345	$1,307	$20,308
3/22/21	30	179,739	363	$1,864	$22,909
4/21/21	30	146,699	456	$1,722	$19,727
5/21/21	30	157,944	510	$1,763	$20,428
6/21/21	31	161,811	1,003	$7,837	$26,329
7/21/21	30	171,185	998	$7,789	$26,858
8/19/21	29	195,086	856	$6,681	$27,206
9/20/21	32	222,451	1,024	$8,132	$28,925
10/19/21	29	175,298	597	$2,653	$20,366
11/17/21	29	159,994	506	$1,918	$18,880
12/20/21	33	190,908	527	$2,300	$20,122
Totals	**367**	**2,075,486**	**1,024**	**$45,225**	**$271,515**
Annual	**365**	**2,064,175**	**1,024**	**$44,979**	**$270,036**

Notes:

- Peak demand of 1,024 kW occurred in September 2021.
- Average demand over the past 12 months was 626 kW.
- The average electric cost over the past 12 months was $0.131/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

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



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
1/21/21	34	8,524	$8,723
2/19/21	29	9,642	$9,858
3/22/21	31	7,111	$7,306
4/22/21	31	12,577	$12,817
5/21/21	29	6,502	$6,646
6/21/21	31	7,870	$8,038
7/21/21	30	7,920	$8,133
8/19/21	29	8,091	$8,311
9/20/21	32	7,012	$7,230
10/19/21	29	7,090	$7,365
11/17/21	29	21,444	$22,357
12/20/21	33	22,520	$23,355
Totals	**367**	**126,305**	**$130,140**
Annual	**365**	**125,617**	**$129,431**

Notes:

- The average gas cost for the past 12 months is $1.030/therm, which is the blended rate used throughout the analysis.
- The gas meters for Orange High School & Prep Academy may be underbilled. Gas billing data was estimated based on the heating equipment ratings and the operational information provided by site personnel.

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	57

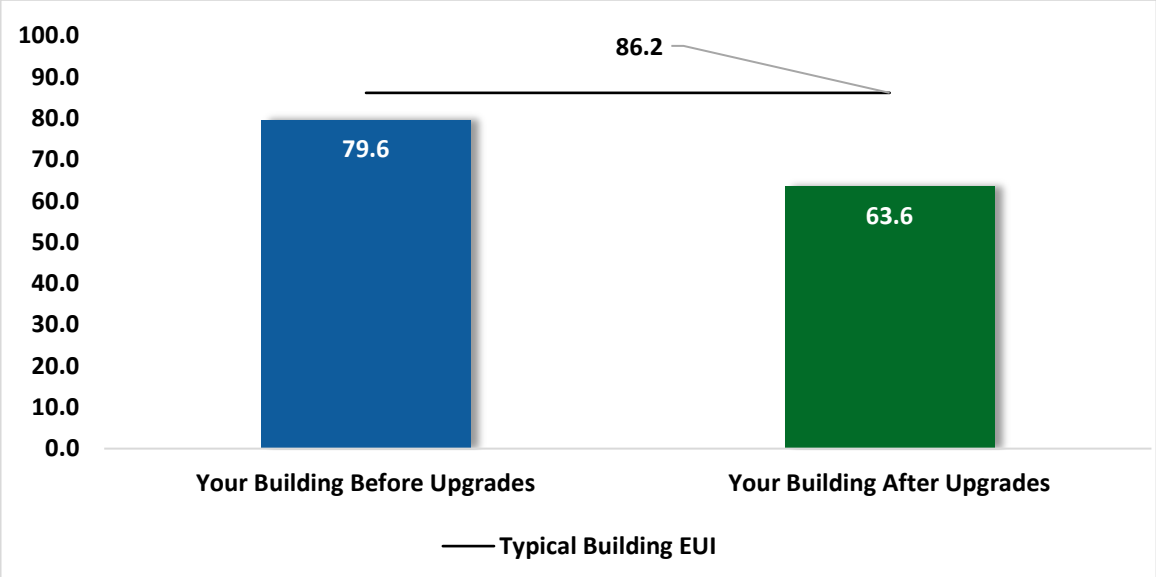


Figure 5 - Energy Use Intensity Comparison[3]

Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance, and lower your energy bills even more.

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

[3] Based on all evaluated ECMs

Tracking Your Energy Performance

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

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

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

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

4 Energy Conservation Measures

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

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

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

Financial incentives in this report are based on the previously run state rebate program SmartStart, which has been retired. Now, all investor-owned gas and electric utility companies are offering complementary energy efficiency programs directly to their customers. Some measures and proposed upgrades may be eligible for higher incentives than those shown below. The incentives in the summary tables should be used for high-level planning purposes. To verify incentives, reach out to your utility provider or visit the NJCEP website for more information.

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**417,933**	**75.7**	**-85**	**$53,797**	**$137,508**	**$31,901**	**$105,607**	**2.0**	**410,885**
ECM 1	Install LED Fixtures	Yes	62,932	10.0	-11	$8,118	$25,827	$2,910	$22,917	2.8	62,066
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	30,256	5.8	-6	$3,893	$9,157	$1,372	$7,785	2.0	29,727
ECM 3	Retrofit Fixtures with LED Lamps	Yes	324,745	59.9	-68	$41,786	$102,525	$27,619	$74,906	1.8	319,092
Lighting Control Measures			**115,078**	**20.9**	**-24**	**$14,807**	**$80,343**	**$24,200**	**$56,143**	**3.8**	**113,065**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	88,294	16.8	-18	$11,360	$57,168	$7,260	$49,908	4.4	86,750
ECM 5	Install High/Low Lighting Controls	Yes	26,784	4.1	-6	$3,446	$23,175	$16,940	$6,235	1.8	26,316
Motor Upgrades			**243**	**0.1**	**0**	**$32**	**$1,774**	**$0**	**$1,774**	**55.8**	**245**
ECM 6	Premium Efficiency Motors	No	243	0.1	0	$32	$1,774	$0	$1,774	55.8	245
Variable Frequency Drive (VFD) Measures			**112,537**	**29.1**	**143**	**$16,199**	**$140,399**	**$12,425**	**$127,974**	**7.9**	**130,111**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	83,969	26.3	0	$10,985	$106,912	$7,425	$99,487	9.1	84,556
ECM 8	Install VFDs on Chilled Water Pumps	Yes	9,960	2.8	0	$1,303	$11,890	$2,000	$9,890	7.6	10,030
ECM 9	Install VFDs on Kitchen Hood Fan Motors	Yes	18,608	0.0	143	$3,912	$21,597	$3,000	$18,597	4.8	35,525
Unitary HVAC Measures			**14,598**	**20.9**	**0**	**$1,910**	**$176,091**	**$7,560**	**$168,531**	**88.2**	**14,700**
ECM 10	Install High Efficiency Air Conditioning Units	No	14,598	20.9	0	$1,910	$176,091	$7,560	$168,531	88.2	14,700
HVAC System Improvements			**437**	**0.0**	**10**	**$163**	**$604**	**$90**	**$514**	**3.2**	**1,644**
ECM 11	Install Pipe Insulation	Yes	437	0.0	10	$163	$604	$90	$514	3.2	1,644
Domestic Water Heating Upgrade			**0**	**0.0**	**24**	**$249**	**$366**	**$183**	**$183**	**0.7**	**2,833**
ECM 12	Install Low-Flow DHW Devices	Yes	0	0.0	24	$249	$366	$183	$183	0.7	2,833
Food Service & Refrigeration Measures			**16,895**	**1.8**	**0**	**$2,210**	**$9,215**	**$905**	**$8,310**	**3.8**	**17,013**
ECM 13	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,571	0.2	0	$205	$2,123	$280	$1,843	9.0	1,582
ECM 14	Refrigeration Controls	No	2,087	0.1	0	$273	$5,022	$225	$4,797	17.6	2,102
ECM 15	Vending Machine Control	Yes	13,237	1.5	0	$1,732	$2,070	$400	$1,670	1.0	13,330
Custom Measures			**23,736**	**0.0**	**1,493**	**$18,489**	**$112,732**	**$0**	**$112,732**	**6.1**	**198,715**
ECM 16	Retro-Commissioning Study	Yes	76,256	0.0	933	$19,589	$98,500	$0	$98,500	5.0	186,033
ECM 17	Replace Gas Fired Water Heater with Heat Pump Water Heater	No	-52,520	0.0	560	-$1,100	$14,232	$0	$14,232	-12.9	12,682
TOTALS			**701,458**	**148.3**	**1,562**	**$107,856**	**$659,032**	**$77,264**	**$581,769**	**5.4**	**889,212**

* - 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).

Negative payback explained in Section 4.9

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		**417,933**	**75.7**	**-85**	**$53,797**	**$137,508**	**$31,901**	**$105,607**	**2.0**	**410,885**
ECM 1	Install LED Fixtures	62,932	10.0	-11	$8,118	$25,827	$2,910	$22,917	2.8	62,066
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	30,256	5.8	-6	$3,893	$9,157	$1,372	$7,785	2.0	29,727
ECM 3	Retrofit Fixtures with LED Lamps	324,745	59.9	-68	$41,786	$102,525	$27,619	$74,906	1.8	319,092
Lighting Control Measures		**115,078**	**20.9**	**-24**	**$14,807**	**$80,343**	**$24,200**	**$56,143**	**3.8**	**113,065**
ECM 4	Install Occupancy Sensor Lighting Controls	88,294	16.8	-18	$11,360	$57,168	$7,260	$49,908	4.4	86,750
ECM 5	Install High/Low Lighting Controls	26,784	4.1	-6	$3,446	$23,175	$16,940	$6,235	1.8	26,316
Variable Frequency Drive (VFD) Measures		**112,537**	**29.1**	**143**	**$16,199**	**$140,399**	**$12,425**	**$127,974**	**7.9**	**130,111**
ECM 7	Install VFDs on Constant Volume (CV) Fans	83,969	26.3	0	$10,985	$106,912	$7,425	$99,487	9.1	84,556
ECM 8	Install VFDs on Chilled Water Pumps	9,960	2.8	0	$1,303	$11,890	$2,000	$9,890	7.6	10,030
ECM 9	Install VFDs on Kitchen Hood Fan Motors	18,608	0.0	143	$3,912	$21,597	$3,000	$18,597	4.8	35,525
HVAC System Improvements		**437**	**0.0**	**10**	**$163**	**$604**	**$90**	**$514**	**3.2**	**1,644**
ECM 11	Install Pipe Insulation	437	0.0	10	$163	$604	$90	$514	3.2	1,644
Domestic Water Heating Upgrade		**0**	**0.0**	**24**	**$249**	**$366**	**$183**	**$183**	**0.7**	**2,833**
ECM 12	Install Low-Flow DHW Devices	0	0.0	24	$249	$366	$183	$183	0.7	2,833
Food Service & Refrigeration Measures		**14,808**	**1.7**	**0**	**$1,937**	**$4,193**	**$680**	**$3,513**	**1.8**	**14,911**
ECM 13	Refrigerator/Freezer Case Electrically Commutated Motors	1,571	0.2	0	$205	$2,123	$280	$1,843	9.0	1,582
ECM 15	Vending Machine Control	13,237	1.5	0	$1,732	$2,070	$400	$1,670	1.0	13,330
Custom Measures		**76,256**	**0.0**	**933**	**$19,589**	**$98,500**	**$0**	**$98,500**	**5.0**	**186,033**
ECM 16	Retro-Commissioning Study	76,256	0.0	933	$19,589	$98,500	$0	$98,500	5.0	186,033
TOTALS		**737,049**	**127.3**	**1,002**	**$106,741**	**$461,913**	**$69,479**	**$392,434**	**3.7**	**859,483**

* - 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		**417,933**	**75.7**	**-85**	**$53,797**	**$137,508**	**$31,901**	**$105,607**	**2.0**	**410,885**
ECM 1	Install LED Fixtures	62,932	10.0	-11	$8,118	$25,827	$2,910	$22,917	2.8	62,066
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	30,256	5.8	-6	$3,893	$9,157	$1,372	$7,785	2.0	29,727
ECM 3	Retrofit Fixtures with LED Lamps	324,745	59.9	-68	$41,786	$102,525	$27,619	$74,906	1.8	319,092

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

ECM 1: Install LED Fixtures

Replace existing fixtures containing high-intensity discharge (HID) lamps with new LED light fixtures. This measure saves energy by installing LEDs, which use less power than other technologies with a comparable light output.

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

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

Affected Building Areas: gymnasium, cafeteria, and exterior MH fixtures.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

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

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

Affected Building Areas: all areas with fluorescent fixtures with T12 tubes.

ECM 3: Retrofit Fixtures with LED Lamps

Replace fluorescent and incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as a direct replacement for most other lighting technologies. Be sure to specify replacement lamps that are compatible with existing dimming controls, where applicable. In some circumstances, you may need to upgrade your dimming system for optimum performance.

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

Affected Building Areas: all areas with incandescent lamps and fluorescent fixtures with T5 and T8 tubes.

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		**115,078**	**20.9**	**-24**	**$14,807**	**$80,343**	**$24,200**	**$56,143**	**3.8**	**113,065**
ECM 4	Install Occupancy Sensor Lighting Controls	88,294	16.8	-18	$11,360	$57,168	$7,260	$49,908	4.4	86,750
ECM 5	Install High/Low Lighting Controls	26,784	4.1	-6	$3,446	$23,175	$16,940	$6,235	1.8	26,316

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

ECM 4: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend 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: classrooms, offices, conference rooms, lounges, gymnasiums, auditorium, kitchens, cafeterias, libraries, locker rooms, restrooms, and storage rooms.

ECM 5: 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, lobbies, and stairwells.

4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**243**	**0.1**	**0**	**$32**	**$1,774**	**$0**	**$1,774**	**55.8**	**245**
ECM 6	Premium Efficiency Motors	243	0.1	0	$32	$1,774	$0	$1,774	55.8	245

ECM 6: Premium Efficiency Motors

We evaluated replacing standard efficiency motors with IHP 2014 efficiency motors. This evaluation assumes that existing motors will be replaced with motors of equivalent size and type. In some cases, additional savings may be possible by downsizing motors to better meet the motor's current load requirements.

Affected Motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Janitorial - Basement - PA	Condensate System	2	Condensate Pump	0.3	Condensate Pump

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

4.4 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**112,537**	**29.1**	**143**	**$16,199**	**$140,399**	**$12,425**	**$127,974**	**7.9**	**130,111**
ECM 7	Install VFDs on Constant Volume (CV) Fans	83,969	26.3	0	$10,985	$106,912	$7,425	$99,487	9.1	84,556
ECM 8	Install VFDs on Chilled Water Pumps	9,960	2.8	0	$1,303	$11,890	$2,000	$9,890	7.6	10,030
ECM 9	Install VFDs on Kitchen Hood Fan Motors	18,608	0.0	143	$3,912	$21,597	$3,000	$18,597	4.8	35,525

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 7: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature.

VAV system controls should not raise the supply air temperature at the expense of the fan power. A common mistake is to reset the supply air temperature to achieve chiller energy savings, which can lead to additional air flow requirements. Supply air temperature should be kept low (e.g., 55°F) until the minimum fan speed (typically about 50%) is met. At this point, it is efficient to raise the supply air temperature as the load decreases, but not such that additional air flow and thus fan energy is required.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

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

Affected Air Handlers: DOAS-1, DOAS-2, HV-1, HV-2, Print Shop AHU, Office 104 AHU, Orange High School Main Gymnasium AHUs, MUA-1, Prep Academy AHU-1, Prep Academy split system, and the 310 Area AHU supply and return/exhaust fans.

ECM 8: Install VFDs on Chilled Water Pumps

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

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

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

Affected Pumps: CHW-1 & CHW-2 serving the Orange High School old wing.

ECM 9: 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.

4.5 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**14,598**	**20.9**	**0**	**$1,910**	**$176,091**	**$7,560**	**$168,531**	**88.2**	**14,700**
ECM 10	Install High Efficiency Air Conditioning Units	14,598	20.9	0	$1,910	$176,091	$7,560	$168,531	88.2	14,700

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

ECM 10: Install High Efficiency Air Conditioning Units

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

Affected Units: older window AC units and split systems.

4.6 HVAC Improvements

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**437**	**0.0**	**10**	**$163**	**$604**	**$90**	**$514**	**3.2**	**1,644**
ECM 11	Install Pipe Insulation	437	0.0	10	$163	$604	$90	$514	3.2	1,644

ECM 11: Install Pipe Insulation

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

Affected Systems: chilled water piping and domestic hot water piping in the Orange High School basement mechanical room.

4.7 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**	**24**	**$249**	**$366**	**$183**	**$183**	**0.7**	**2,833**
ECM 12	Install Low-Flow DHW Devices	0	0.0	24	$249	$366	$183	$183	0.7	2,833

ECM 12: 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.

4.8 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		**16,895**	**1.8**	**0**	**$2,210**	**$9,215**	**$905**	**$8,310**	**3.8**	**17,013**
ECM 13	Refrigerator/Freezer Case Electrically Commutated Motors	1,571	0.2	0	$205	$2,123	$280	$1,843	9.0	1,582
ECM 14	Refrigeration Controls	2,087	0.1	0	$273	$5,022	$225	$4,797	17.6	2,102
ECM 15	Vending Machine Control	13,237	1.5	0	$1,732	$2,070	$400	$1,670	1.0	13,330

ECM 13: Refrigerator/Freezer Case Electrically Commutated Motors

Replace shaded pole or permanent split capacitor (PSC) fan motors with electronically commutated (EC) motors in walk-in coolers and freezers. 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 14: Refrigeration Controls

We evaluated installing 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.

ECM 15: Vending Machine Control

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

4.9 Custom 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)
Custom Measures		**23,736**	**0.0**	**1,493**	**$18,489**	**$112,732**	**$0**	**$112,732**	**6.1**	**198,715**
ECM 16	Retro-Commissioning Study	76,256	0.0	933	$19,589	$98,500	$0	$98,500	5.0	186,033
ECM 17	Replace Gas Fired Water Heater with Heat Pump Water Heater	-52,520	0.0	560	-$1,100	$14,232	$0	$14,232	-12.9	12,682

ECM 16: Retro-Commissioning Study

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

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

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

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

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

A high-level evaluation of potential savings and costs is provided for demonstration purposes only. It is a screening evaluation for the potential in HVAC control improvements. Based on industry standards and previous project experience, the potential energy savings may be up to 15% of existing HVAC energy use. We estimate the cost of retro-commissioning studies and control improvements of $0.40 per square foot. Actual savings and costs will need to be outlined by the specific contractor engaged to perform the study. For the purposes of this report, we have conservatively estimated savings to be 8.0% of the HVAC energy consumption baseline.

ECM 17: Replace Gas Fired Water Heater with Heat Pump Water Heater

A gas fired water heater uses a burner to heat water. Air source heat pump water heaters (HPWH) use a refrigeration cycle to transfer heat from the surrounding air to the domestic water. Water heater efficiency is rated by the uniform energy factor (UEF). For a relative comparison of water heater UEFs, the criteria for certifying a water heater in the ENERGY STAR® program are provided below. These values indicate that HPWH heaters are significantly more efficient than gas fired water heaters.

There are two types of HPWH: those integrated with the heat pump and storage tank in the same unit, and those that are split into two sections (with the storage tank separate from the heat pump). The measure considers an integrated HPWH.

ENERGY STAR ®Uniform Energy Factor (UEF) Criteria for Certified Water Heaters *

Water Heater Type	Minimum UEF	Other
Integrated HPWH	3.3	
Integrated HPWH	2.2	120 Volt, 15 Amp circuit
Split System HPWH	2.2	
Gas Fired Storage	0.64	≤ 55 gal, Medium Draw Pattern
Gas Fired Storage	0.68	≤ 55-gal, High Draw Pattern
Gas Fired Storage	0.78	> 55-gal, Medium Draw Pattern
Gas Fired Storage	0.80	> 55-gal, High Draw Pattern
Gas Fired Storage	0.80	Residential Duty
Gas Fired Instantaneous	0.87	

** Note: Uniform Energy Factor (UEF): The newest measure of water heater overall efficiency. The higher the UEF value is, the more efficient the water heater. UEF is determined by the Department of Energy's test method outlined in 10 CFR Part 430, Subpart B, Appendix E.*[4]

HPWH reject cold air. As such, they need to be installed in an unconditioned space of about 750 cubic feet with good ventilation[5]. Ideal locations are garages, large enclosed, unconditioned storage areas, or areas with excess heat such as a furnace or boiler room. The HPWH will also produce condensate so accommodations for draining the condensate need to be provided.

Most HPWH operate effectively down to an air temperature of 40 °F. Below that temperature, an electric resistance booster heater is typically required to achieve full heating capacity. It is critical that the HPWH controls are set up so that the electric resistance heat only engages when the air temperature is too cold for the HPWH to extract heat from it. HPWHs have a slow recovery. During periods of high demand, the electric resistance heating element, if enabled, may be energized to maintain set point, thus reducing the

[4] https://www.energy.gov/sites/prod/files/2014/06/f17/rwh_tp_final_rule.pdf

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

overall efficiency of the unit. It is recommended that a careful analysis of the hot water demand be conducted to determine if the application makes economic sense, and the HPWH heating capacity and storage are properly sized.

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

Switching from a gas-fired water heater to a HPWH has the potential to reduce the sites overall greenhouse gas emissions. If the electricity for the HPWH is provided by an on-site photovoltaic (PV) system, then there are essentially no greenhouse gas (GHG) emissions. A 2016 study conducted at Cornell[6]calculated the kg of methane (CH_4) and carbon dioxide (CO_2) produced per GJ of water heated. The study compared HPWH to gas and electric fired, storage and tankless water heaters. The study also considered electricity produced from natural gas and coal fired electric plants. In all cases the study found that HPWHs produced less methane than all of the other water heaters. The study also found that HPWH produced less carbon dioxide than electric resistance water heaters but more carbon dioxide than tankless gas water heaters and about the same amount of carbon dioxide as storage gas water heaters. The summary tables provide the reduction in CO2 equivalent emissions based on the typical New Jersey electric utility.

This measure has a negative simple payback due to the relative cost of electricity to natural gas. At this site the cost per Btu for natural gas is significantly lower than for electricity. Therefore, even though this measure will result in a net energy savings in terms of Btu at this site it will increase the overall cost for providing domestic hot water.

[6] Greenhouse gas emissions from domestic hot water: Heat pumps compared to most commonly used systems. Bongghi Hong, Robert W. Howarth. Department of Ecology and Evolutionary Biology, Cornell University. Energy Science and Engineering 2016.

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

Weatherization

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

Doors and Windows

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

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

Lighting Maintenance

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

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

Lighting Controls

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

Motor Maintenance

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

Fans to Reduce Cooling Load

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

Thermostat Schedules and Temperature Resets

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

Economizer Maintenance

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

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

Chiller Maintenance

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

Ductwork Maintenance

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

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

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

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

Steam Trap Repair and Replacement

Steam traps are a crucial part of delivering heat from the boiler to the space heating units. Steam traps are automatic valves that remove condensate from the system. If the traps fail closed, condensate can build up in the steam supply side of the trap, which reduces the flow in the steam lines and thermal capacity of the radiators. Or they may fail open, allowing steam into the condensate return lines resulting in wasted energy, water, and hammering. Losses can be significantly reduced by testing and replacing equipment as they start to fail. Repair or replace traps that are blocked or allowing steam to pass. Inspect steam traps as part of a regular steam system maintenance plan.

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.

Furnace Maintenance

Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should check for gas / carbon monoxide leaks; change the air and fuel filters; check components for cracks, corrosion, dirt, or debris build-up; ensure the ignition system is working properly; test and adjust operation and safety controls; inspect electrical connections; and lubricate motors and bearings.

Label HVAC Equipment

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

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

Optimize HVAC Equipment Schedules

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

Know your BAS scheduling capabilities. Regularly monitor HVAC equipment operating schedules and match them to building operating hours in order to eliminate unnecessary equipment operation and save energy. Monitoring should be performed often at sites with frequently changing usage patterns – daily in some cases. We recommend using the *optimal start* feature of the BAS (if available) to optimize the

building warmup sequence. Most BAS scheduling programs provide for holiday schedules, which can be used during reduced use or shutdown periods. Finally, many systems are equipped with a one-time override function, which can be used to provide additional space conditioning due to a one-time, special event. When available this override feature should be used rather than changing the base operating schedule.

Water Heater Maintenance

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

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

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

Refrigeration Equipment Maintenance

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

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

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

Water Conservation

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

For more information regarding water conservation go to the EPA's WaterSense™ website[8] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[9] 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.

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

[9] 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.

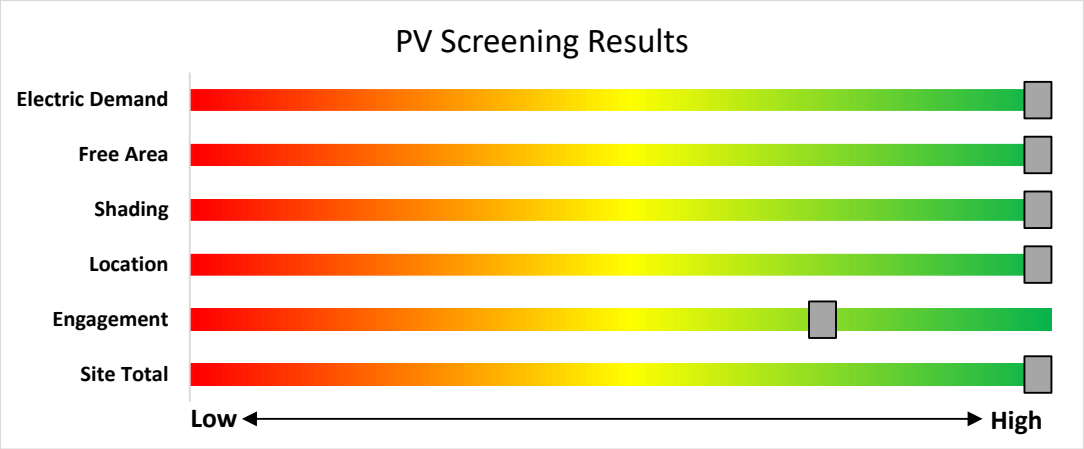
6.1 Solar Photovoltaic

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 high potential for installing a PV array.

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

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



Potential	High	
System Potential	626	kW DC STC
Electric Generation	745,798	kWh/yr
Displaced Cost	$97,570	/yr
Installed Cost	$1,627,600	

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.

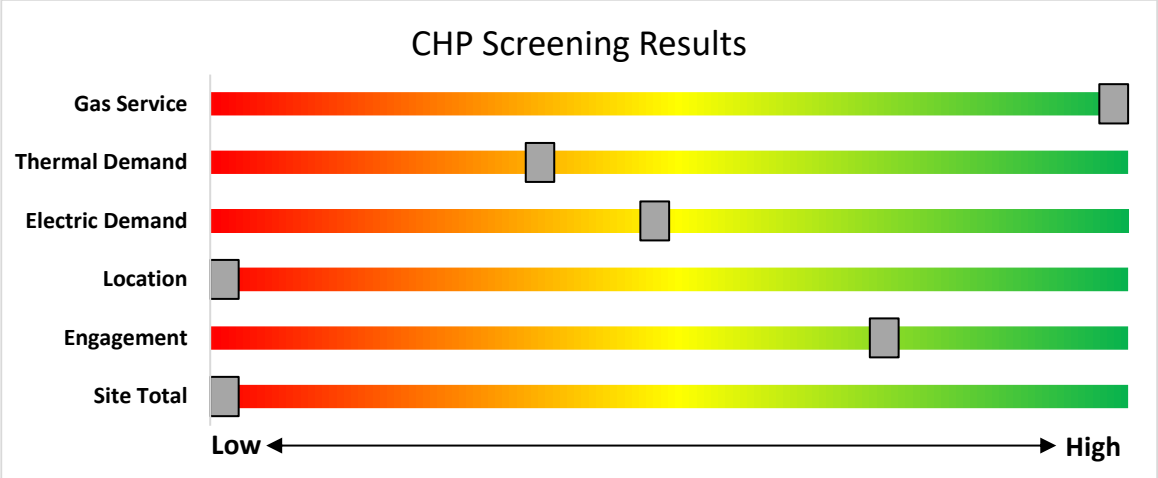


Figure 9 - Combined Heat and Power Screening

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)

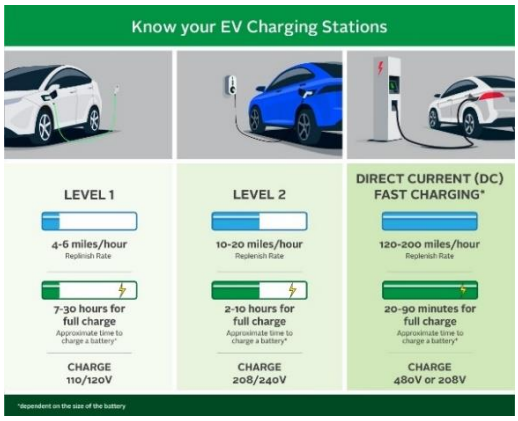
All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes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

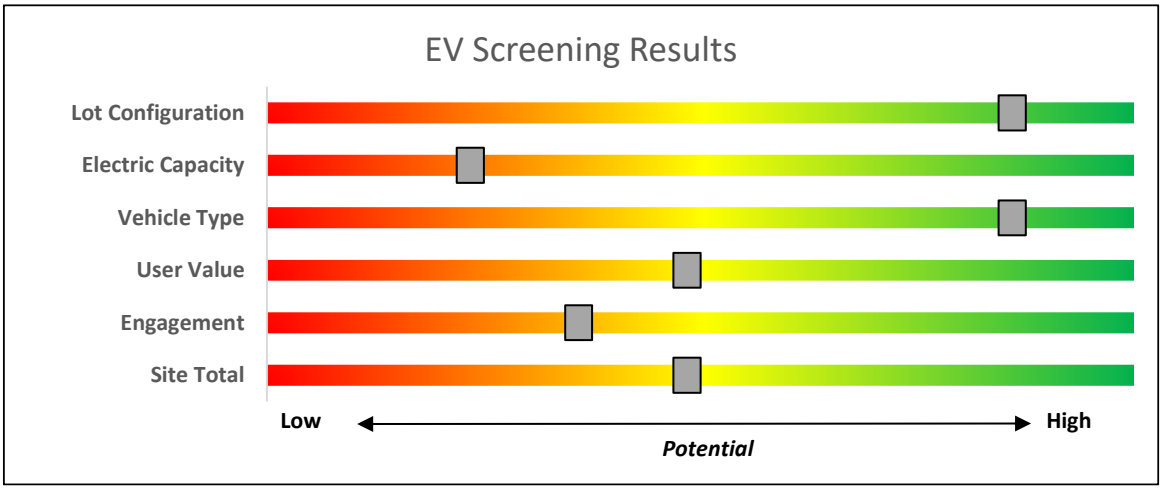


Figure 10 – EV Charger Screening

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 Fuel Cells with Heat Recovery	>3 MW	$350		
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

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

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

How to Participate

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

Successor Solar Incentive Program (SuSI)

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

Administratively Determined Incentive (ADI) Program

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

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

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

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

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

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

Competitive Solar Incentive Program

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

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

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

Energy Savings Improvement Program

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

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

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

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

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

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

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

9 PROJECT DEVELOPMENT

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

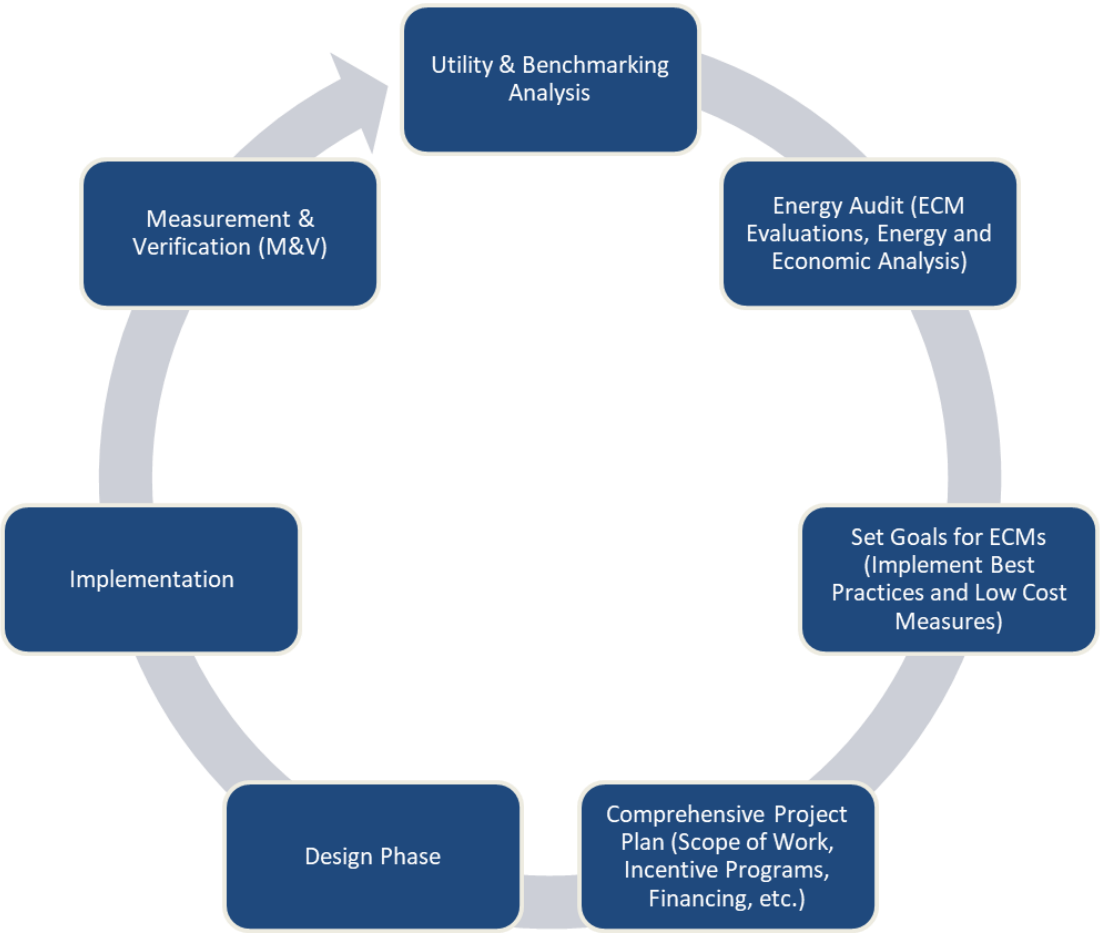


Figure 11 – Project Development Cycle

10 Energy Purchasing and Procurement Strategies

10.1 Retail Electric Supply Options

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

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[10].

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[11].

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

[11] 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
Cafeteria - 1st Floor - HS	4	LED - Fixtures: Ceiling Mount	Occupancy Sensor	S	15	2,960		None	No	4	LED - Fixtures: Ceiling Mount	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Cafeteria - 1st Floor - HS	39	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	39	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 103 - Home Ec - HS	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.6	3,233	-1	$416	$1,270	$270	2.4
Classroom 107 - HS	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.3	1,778	0	$229	$672	$145	2.3
Classroom 108 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.4	1,940	0	$250	$708	$155	2.2
Classroom 109 - HS	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.3	1,778	0	$229	$672	$145	2.3
Classroom 112 - HS	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.5	2,748	-1	$354	$1,161	$240	2.6
Classroom 113a - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.2	970	0	$125	$489	$95	3.2
Classroom 113b - HS	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.5	2,587	-1	$333	$1,124	$230	2.7
Classroom 114 - HS	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.6	3,395	-1	$437	$1,037	$245	1.8
Classroom 115a - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.5	2,910	-1	$374	$927	$215	1.9
Classroom 115b - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 115c - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.5	2,910	-1	$374	$927	$215	1.9
Classroom 115d - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 116 - HS	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.6	3,395	-1	$437	$1,037	$245	1.8
Classroom 118 - HS	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.3	1,778	0	$229	$672	$145	2.3
Classroom 119 - HS	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.3	1,778	0	$229	$672	$145	2.3
Classroom 120 - HS	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.5	2,667	-1	$343	$872	$200	2.0
Classroom 121 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.4	1,940	0	$250	$708	$155	2.2
Classroom 123a - HS	9	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	9	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 123b - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 124 - HS	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,960		None	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 125 - HS	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,960		None	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 167 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 169 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	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
Classroom 170 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 171 - HS	23	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	23	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 172 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 173 - HS	23	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	23	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 174 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 176 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 177 - HS	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 178 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom Art 105 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.4	1,940	0	$250	$708	$155	2.2
Classroom Art 105 - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Conference - 100 - HS	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Conference 161B - HS	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
Conference 161B - HS	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Conference 212 - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.2	970	0	$125	$489	$95	3.2
Corridor - 1st - HS	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - 1st - HS	10	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,290	3, 5	Relamp	Yes	10	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	2,960	0.2	1,004	0	$129	$775	$410	2.8
Corridor - 1st - HS	21	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	21	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	1.1	7,331	-2	$943	$2,434	$1,155	1.4
Corridor - 1st New Wing - HS	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
Corridor - 1st New Wing - HS	15	LED - Fixtures: Ceiling Mount	Wall Switch	S	15	4,290	5	None	Yes	15	LED - Fixtures: Ceiling Mount	High/Low Control	15	2,960	0.1	329	0	$42	$675	$525	3.5
Corridor - 1st New Wing - HS	18	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,290	5	None	Yes	18	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,960	0.1	382	0	$49	$675	$630	0.9
Corridor - 1st Nurse / Gym - HS	2	LED - Fixtures: Ceiling Mount	Wall Switch	S	15	4,290	5	None	Yes	2	LED - Fixtures: Ceiling Mount	High/Low Control	15	2,960	0.0	44	0	$6	$225	$70	27.4
Corridor - 1st Nurse / Gym - HS	6	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,290	5	None	Yes	6	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,960	0.0	127	0	$16	$225	$210	0.9
Corridor - 1st Nurse / Gym - HS	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,290	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	2,960	0.0	100	0	$13	$33	$6	2.1
Corridor - 1st Nurse / Gym - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.3	2,095	0	$270	$663	$330	1.2
Corridor - 1st Old Wing Cafeteria - HS	8	Incandescent: (1) 60W PAR30 Screw-In Lamp	Wall Switch	S	60	4,290	3, 5	Relamp	Yes	8	LED Lamps: PAR30 Lamps	High/Low Control	9	2,960	0.3	2,031	0	$261	$636	$304	1.3

	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
Corridor - 1st Old Wing Cafeteria - HS	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	4,290	5	None	Yes	1	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	2,960	0.0	25	0	$3	$0	$0	0.0
Corridor - 1st Old Wing Cafeteria - HS	5	Linear Fluorescent - T12: 2' T12 (20W) - 4L	Wall Switch	S	100	4,290	2, 5	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 2' Lamps	High/Low Control	34	2,960	0.3	1,806	0	$232	$777	$235	2.3
Corridor - 1st Old Wing Cafeteria - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,290	3, 5	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,960	0.0	311	0	$40	$280	$120	4.0
Corridor - 1st Old Wing Cafeteria - HS	13	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	13	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.7	4,538	-1	$584	$1,624	$715	1.6
Corridor - 1st Old Wing Staff Cafe - HS	10	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,290	3, 5	Relamp	Yes	10	LED Lamps: A19 Lamps	High/Low Control	9	2,960	0.4	2,538	-1	$327	$622	$360	0.8
Corridor - 1st Old Wing Staff Cafe - HS	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,290	3, 5	Relamp	Yes	4	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	2,960	0.1	401	0	$52	$355	$164	3.7
Corridor - 1st Old Wing Staff Cafe - HS	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.8	5,237	-1	$674	$1,770	$825	1.4
Corridor - Aux Gym - HS	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - Aux Gym - HS	2	LED - Fixtures: Ceiling Mount	Wall Switch	S	15	4,290	5	None	Yes	2	LED - Fixtures: Ceiling Mount	High/Low Control	15	2,960	0.0	44	0	$6	$225	$70	27.4
Corridor - Aux Gym - HS	28	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,290	5	None	Yes	28	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,960	0.1	594	0	$76	$1,125	$980	1.9
Corridor - Exit #1 - HS	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 - Exit #1 - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,290	3, 5	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,960	0.3	1,783	0	$229	$554	$300	1.1
Corridor - Exit #6 - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.3	2,095	0	$270	$663	$330	1.2
Corridor - Office - 102 - HS	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	4,290	2, 5	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.1	642	0	$83	$118	$20	1.2
Corridor - Office - 102 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.2	1,047	0	$135	$444	$165	2.1
Corridor - Office - 102 - HS	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,290	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	2,960	0.0	185	0	$24	$72	$10	2.6
Corridor 113 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.1	698	0	$90	$371	$110	2.9
Corridor 113 Exit - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.1	698	0	$90	$371	$110	2.9
Corridor 115 - HS	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,290	3, 5	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.2	1,387	0	$178	$706	$315	2.2
Corridor 123 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,290	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.1	594	0	$76	$335	$135	2.6
Electrical Room - 113 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	780	3	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	780	0.1	144	0	$19	$219	$60	8.6
Electrical Room 166A - HS	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Guidance Office - 101 - HS	14	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	S	9	2,960		None	No	14	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,960	0.0	0	0	$0	$0	$0	0.0
Gymnasium - Weight Room 117 - HS	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	1.1	5,820	-1	$749	$1,855	$430	1.9
Gymnasium 162 - Aux - HS	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

	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
Gymnasium 162 - Aux - HS	7	LED - Fixtures: Ceiling Mount	Wall Switch	S	15	3,500	4	None	Yes	7	LED - Fixtures: Ceiling Mount	Occupancy Sensor	15	2,415	0.0	125	0	$16	$270	$35	14.6
Gymnasium 162 - Aux - HS	18	LED - Fixtures: High-Bay	Wall Switch	S	150	3,500	4	None	Yes	18	LED - Fixtures: High-Bay	Occupancy Sensor	150	2,415	0.6	3,222	-1	$415	$540	$70	1.1
Janitorial - Kitchen - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	538	0.0	38	0	$5	$153	$30	25.2
Janitorial 165B - HS	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Janitorial 1st Old Wing Cafeteria - HS	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	780		None	No	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	9	780	0.0	0	0	$0	$0	$0	0.0
Kitchen - 1st Floor - HS	30	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	30	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	1.6	8,545	-2	$1,099	$2,731	$670	1.9
Kitchen - Snack Room - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	1,139	0	$147	$562	$115	3.1
Library 161 - HS	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 161 - HS	31	LED - Fixtures: Ceiling Mount	Occupancy Sensor	S	15	2,960		None	No	31	LED - Fixtures: Ceiling Mount	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Library 161 - HS	37	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	37	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Locker Room - Kitchen - HS	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	3,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	3,500	0.0	196	0	$25	$17	$1	0.6
Locker Room - Kitchen - HS	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	3,500		None	No	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	9	3,500	0.0	0	0	$0	$0	$0	0.0
Locker Room - Kitchen - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,500	0.0	127	0	$16	$37	$10	1.6
Locker Room - Mens - HS	7	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	S	9	2,960		None	No	7	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	2,960	0.0	0	0	$0	$0	$0	0.0
Locker Room - Mens - HS	18	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	18	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Locker Room - Mens - HS	2	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	3,500	2, 4	Relamp & Reballast	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.1	277	0	$36	$217	$30	5.2
Locker Room - Mens - HS	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,500	3, 4	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.1	423	0	$54	$361	$60	5.5
Locker Room - Mens Basketball - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	1,139	0	$147	$562	$115	3.1
Locker Room - Women - HS	17	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	17	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Locker Room - Women - HS	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.2	847	0	$109	$453	$85	3.4
Main Gymnasium - HS	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
Main Gymnasium - HS	7	LED - Fixtures: High-Bay	Wall Switch	S	150	3,500	4	None	Yes	7	LED - Fixtures: High-Bay	Occupancy Sensor	150	2,415	0.2	1,253	0	$161	$270	$35	1.5
Main Gymnasium - HS	41	Metal Halide: (1) 400W Lamp	Wall Switch	S	458	3,500	1, 4	Fixture Replacement	Yes	41	LED - Fixtures: High-Bay	Occupancy Sensor	120	2,415	11.1	59,225	-12	$7,620	$29,212	$3,485	3.4
Main Office - 100 - HS	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Main Office - 100 - HS	2	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	S	9	2,960		None	No	2	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,960	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
Main Office - Intercom - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Mechanical - Elevator #2 - HS	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Mechanical - Sprinkler 179 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Mechanical 102 - HS	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	780	2	Relamp & Reballast	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	780	0.2	202	0	$26	$237	$40	7.6
Office - 100 #1 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #2 - HS	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #3 - HS	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #4 - HS	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #4 - HS	2	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	S	9	2,960		None	No	2	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #5 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #6 - HS	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #7 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #8 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #9 - HS	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 100 #9 - HS	1	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	S	9	2,960		None	No	1	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 102 #1 - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	1,139	0	$147	$562	$115	3.1
Office - 102 #2 - HS	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2, 4	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.3	1,571	0	$202	$625	$95	2.6
Office - 102 #3 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	854	0	$110	$489	$95	3.6
Office - 102 #4 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Office - 104 - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,500	0.0	127	0	$16	$37	$10	1.6
Office - 104 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.6	3,418	-1	$440	$1,146	$275	2.0
Office - 104 #1 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.1	485	0	$62	$226	$50	2.8
Office - 104 #2 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.1	485	0	$62	$226	$50	2.8
Office - 104 #3 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.1	485	0	$62	$226	$50	2.8
Office - 104 #4 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.1	485	0	$62	$226	$50	2.8

	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 - 104 #5 - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.2	970	0	$125	$489	$95	3.2
Office - 114a - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Office - 122 Nurse - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.1	323	0	$42	$189	$40	3.6
Office - 122 Nurse - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	854	0	$110	$489	$95	3.6
Office - 161A - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 161C Copy - HS	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 163 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 163A - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - Athletic Director - HS	9	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	3,500	2, 4	Relamp & Reballast	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.4	2,356	0	$303	$889	$125	2.5
Office - Custodian - HS	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	3,500	4	None	Yes	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	2,415	0.0	21	0	$3	$116	$20	34.7
Office - Custodian - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - Locker Room Mens - HS	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,415	0.0	246	0	$32	$368	$18	11.1
Office - Locker Room Women - HS	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	3,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	3,500	0.0	196	0	$25	$17	$1	0.6
Office - Locker Room Women - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.1	323	0	$42	$189	$40	3.6
Restroom - Office - Main Gym #1 - HS	1	Incandescent: (3) 60W A19 Screw-In Lamps	Wall Switch	S	180	3,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	27	3,500	0.1	589	0	$76	$52	$3	0.6
Office - Main Gym #1 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	854	0	$110	$489	$95	3.6
Office - Tech - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.3	1,709	0	$220	$708	$155	2.5
Office 113a - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Office 202 - HS	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,415	0.0	164	0	$21	$181	$32	7.1
Office 202 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.1	323	0	$42	$189	$40	3.6
Office 214 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.1	323	0	$42	$189	$40	3.6
Print Shop 106 - HS	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,500	0.0	62	0	$8	$33	$6	3.3
Print Shop 106 - HS	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.7	3,880	-1	$499	$1,416	$310	2.2
Print Shop 106 - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9

	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 - 164A - HS	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Restroom - 164B - HS	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Restroom - Female 165C - HS	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Restroom - Female Cafeteria 1st - HS	4	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	3,500	2, 4	Relamp & Reballast	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.1	554	0	$71	$472	$20	6.3
Restroom - Female Faculty Cafeteria 1st - HS	3	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	3,500	2, 4	Relamp & Reballast	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.1	416	0	$53	$422	$15	7.6
Restroom - Main Office - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	2,960	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,960	0.0	182	0	$23	$73	$20	2.3
Restroom - Male 165A - HS	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Restroom - Male Cafeteria 1st - HS	4	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	3,500	2, 4	Relamp & Reballast	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.1	554	0	$71	$472	$20	6.3
Restroom - Male Faculty Cafeteria 1st - HS	3	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	3,500	2, 4	Relamp & Reballast	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.1	416	0	$53	$422	$15	7.6
Restroom - Nurse - HS	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	3,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	3,500	0.0	196	0	$25	$17	$1	0.6
Shop 177A - HS	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Staff Dining Area - HS	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
Staff Dining Area - HS	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.7	3,988	-1	$513	$1,292	$315	1.9
Stairs #2 - HS	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs #2 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	4,290	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.1	594	0	$76	$110	$30	1.0
Stairs #2 - HS	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,290	3, 5	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.4	2,444	-1	$314	$961	$385	1.8
Stairs #5 - HS	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs #5 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	4,290	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.1	594	0	$76	$110	$30	1.0
Stairs #5 - HS	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,290	3, 5	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.4	2,444	-1	$314	$961	$385	1.8
Stairs #8 - HS	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs #8 - HS	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,290	3, 5	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.4	2,444	-1	$314	$961	$385	1.8
Stairs #8 - HS	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	4,290	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	2,960	0.1	370	0	$48	$145	$20	2.6
Stairs G - HS	7	LED - Fixtures: Ceiling Mount	Occupancy Sensor		40	2,960		None	No	7	LED - Fixtures: Ceiling Mount	Occupancy Sensor	40	2,960	0.0	0	0	$0	$0	$0	0.0
Stairs G - HS	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor		15	2,960		None	No	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Stairs H - HS	7	LED - Fixtures: Ceiling Mount	Occupancy Sensor		40	2,960		None	No	7	LED - Fixtures: Ceiling Mount	Occupancy Sensor	40	2,960	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 H - HS	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor		15	2,960		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Stairs J - HS	4	LED - Fixtures: Ceiling Mount	Occupancy Sensor		40	2,960		None	No	4	LED - Fixtures: Ceiling Mount	Occupancy Sensor	40	2,960	0.0	0	0	$0	$0	$0	0.0
Storage - Kitchen - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	780	3, 4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	538	0.1	75	0	$10	$343	$20	33.3
Storage - Locker Room Mens - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	538	0.1	127	0	$16	$262	$40	13.6
Storage - Office - Tech - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	538	0.1	127	0	$16	$262	$40	13.6
Storage 102 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	780	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	538	0.2	190	0	$25	$489	$60	17.5
Storage 103 - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	780	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	538	0.1	144	0	$19	$416	$40	20.3
Storage 104 - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	780	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	780	0.0	28	0	$4	$37	$10	7.3
Storage 105 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780	4	None	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	538	0.0	8	0	$1	$116	$0	116.9
Storage 106 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	538	0.1	72	0	$9	$189	$20	18.2
Storage 113 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	538	0.1	127	0	$16	$262	$40	13.6
Storage 113 #2 - HS	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	780	3	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	780	0.0	25	0	$3	$72	$10	19.5
Storage 114B - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	780	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	780	0.0	48	0	$6	$73	$20	8.6
Storage 161D - HS	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Storage 162A - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Storage 171A - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Storage 177B - HS	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Storage Nurse #1 - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	780	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	780	0.0	28	0	$4	$37	$10	7.3
Storage Nurse #2 - HS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	780	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	780	0.0	28	0	$4	$37	$10	7.3
Storage Nurse #3 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	538	0.1	127	0	$16	$262	$40	13.6
Cafeteria - 2nd Floor - HS	5	LED - Fixtures: Ceiling Mount	Occupancy Sensor	S	15	2,960		None	No	5	LED - Fixtures: Ceiling Mount	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Cafeteria - 2nd Floor - HS	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 201 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.4	2,182	0	$281	$763	$170	2.1
Classroom 203 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.4	2,182	0	$281	$763	$170	2.1
Classroom 204 - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.3	1,455	0	$187	$599	$125	2.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 205 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.4	2,182	0	$281	$763	$170	2.1
Classroom 206 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.5	2,910	-1	$374	$927	$215	1.9
Classroom 207 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.4	2,182	0	$281	$763	$170	2.1
Classroom 208 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.5	2,910	-1	$374	$927	$215	1.9
Classroom 209 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.4	2,182	0	$281	$763	$170	2.1
Classroom 210 - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.3	1,455	0	$187	$599	$125	2.5
Classroom 211 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.4	2,182	0	$281	$763	$170	2.1
Classroom 213a - HS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.2	1,293	0	$166	$562	$115	2.7
Classroom 213b - HS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.2	1,293	0	$166	$562	$115	2.7
Classroom 215 - HS	7	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,415	0.1	573	0	$74	$498	$77	5.7
Classroom 215 - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.2	970	0	$125	$489	$95	3.2
Classroom 216 - HS	7	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,415	0.1	573	0	$74	$498	$77	5.7
Classroom 216 - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.2	970	0	$125	$489	$95	3.2
Classroom 219 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.5	2,910	-1	$374	$927	$215	1.9
Classroom 221 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.5	2,910	-1	$374	$927	$215	1.9
Classroom 222 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.4	1,940	0	$250	$708	$155	2.2
Classroom 223 - HS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.4	1,940	0	$250	$708	$155	2.2
Classroom 224 - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.3	1,709	0	$220	$708	$155	2.5
Classroom 225 - HS	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.5	2,910	-1	$374	$1,197	$250	2.5
Classroom 227 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 229 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 230 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 231 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 232 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 233 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2

Location	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 235 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 236 - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	1,139	0	$147	$562	$115	3.1
Classroom 237 - HS	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,563	-1	$330	$927	$215	2.2
Classroom 238 - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.3	1,709	0	$220	$708	$155	2.5
Classroom 239 - HS	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.8	4,365	-1	$562	$1,526	$340	2.1
Classroom 240 - HS	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.8	4,365	-1	$562	$1,526	$340	2.1
Classroom 241 - HS	20	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	20	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 242 - HS	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.5	2,425	-1	$312	$818	$185	2.0
Classroom 245 - HS	20	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	20	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 246 - HS	25	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	25	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.8	4,042	-1	$520	$1,453	$320	2.2
Classroom 247 - HS	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 248 - HS	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 267 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 268 - HS	15	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	15	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 269 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 270 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 271 - HS	20	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	20	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 272 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 273 - HS	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 274 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 275 - HS	22	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	22	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 276 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 277 - HS	22	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	22	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Classroom 278 - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Corridor - 2nd New Wing - HS	9	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	9	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Corridor - 2nd New Wing - HS	17	LED - Fixtures: Ceiling Mount	Wall Switch	S	15	4,290	5	None	Yes	17	LED - Fixtures: Ceiling Mount	High/Low Control	15	2,960	0.1	373	0	$48	$675	$595	1.7
Corridor - 2nd New Wing - HS	22	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,290	5	None	Yes	22	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,960	0.1	467	0	$60	$900	$770	2.2
Corridor - 2nd Old Wing - HS	12	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	12	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - 2nd Old Wing - HS	3	LED - Fixtures: Ceiling Mount	Wall Switch	S	15	4,290	5	None	Yes	3	LED - Fixtures: Ceiling Mount	High/Low Control	15	2,960	0.0	66	0	$8	$225	$105	14.2
Corridor - 2nd Old Wing - HS	14	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	S	63	4,290	3, 5	Relamp	Yes	14	LED - Linear Tubes: (4) 2' Lamps	High/Low Control	34	2,960	0.4	2,612	-1	$336	$1,585	$658	2.8
Corridor - 2nd Old Wing - HS	61	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	61	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	3.2	21,296	-4	$2,740	$6,930	$3,355	1.3
Corridor - 2nd Old Wing Band - HS	4	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	S	63	4,290	3, 5	Relamp	Yes	4	LED - Linear Tubes: (4) 2' Lamps	High/Low Control	34	2,960	0.1	746	0	$96	$485	$188	3.1
Corridor - 2nd Old Wing Band - HS	13	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	13	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.7	4,538	-1	$584	$1,624	$715	1.6
Corridor - 2nd Old Wing Cafe - HS	4	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	S	63	4,290	3, 5	Relamp	Yes	4	LED - Linear Tubes: (4) 2' Lamps	High/Low Control	34	2,960	0.1	746	0	$96	$485	$188	3.1
Corridor - 2nd Old Wing Cafe - HS	13	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	13	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.7	4,538	-1	$584	$1,624	$715	1.6
Electrical Room 266 - HS	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Janitorial - 2nd Female - HS	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	780	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	780	0.0	44	0	$6	$17	$1	2.9
Janitorial - 2nd Male - HS	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	780	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	780	0.0	44	0	$6	$17	$1	2.9
Janitorial 265B - HS	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Kitchen - 2nd Floor - HS	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	29	2,960		None	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 220 - HS	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.3	1,455	0	$187	$599	$125	2.5
Office - 226 - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.2	970	0	$125	$489	$95	3.2
Office - 226b - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.2	970	0	$125	$489	$95	3.2
Office - 228 - HS	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	1,994	0	$257	$781	$175	2.4
Office - 236b - HS	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,415	0.2	970	0	$125	$489	$95	3.2
Office - 243 - HS	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	1,994	0	$257	$781	$175	2.4
Office - 244 - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	854	0	$110	$489	$95	3.6
Office - 244 #1 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Office - 244 #2 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Office - 244 #3 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8

	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 - 263 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office - 263A - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Office 234 - HS	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	1,994	0	$257	$781	$175	2.4
Restroom - 264A - HS	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Restroom - 264B - HS	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Restroom - 2nd Floor Faculty #1 - HS	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,500	0.0	121	0	$16	$51	$5	2.9
Restroom - 2nd Floor Faculty #2 - HS	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,500	0.0	121	0	$16	$51	$5	2.9
Restroom - 2nd Floor Female - HS	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,500	3, 4	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.1	423	0	$54	$361	$60	5.5
Restroom - 2nd Floor Female Faculty - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,500	3, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.0	254	0	$33	$325	$15	9.5
Restroom - 2nd Floor Male - HS	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,500	3, 4	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.1	423	0	$54	$361	$60	5.5
Restroom - 2nd Floor Male Faculty - HS	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,500	3, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,415	0.0	254	0	$33	$325	$15	9.5
Restroom - Female 265C - HS	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Restroom - Male 265A - HS	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	S	17	2,960		None	No	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,960	0.0	0	0	$0	$0	$0	0.0
Storage 218B - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Storage 240/239 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	538	0.1	108	0	$14	$226	$30	14.1
Storage 242 - HS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	538	0.1	72	0	$9	$189	$20	18.2
Storage 245 - HS	1	LED Lamps: (1) 100W Corn Bulb Screw-In Lamp	Occupancy Sensor	S	100	520		None	No	1	LED Lamps: (1) 100W Corn Bulb Screw-In Lamp	Occupancy Sensor	100	520	0.0	0	0	$0	$0	$0	0.0
Storage 245/244 - HS	1	LED Lamps: (1) 100W Corn Bulb Screw-In Lamp	Occupancy Sensor	S	100	520		None	No	1	LED Lamps: (1) 100W Corn Bulb Screw-In Lamp	Occupancy Sensor	100	520	0.0	0	0	$0	$0	$0	0.0
Storage 246 - HS	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	780	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	538	0.0	36	0	$5	$181	$12	36.0
Storage 247/248 - HS	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Storage 273A - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Storage 277A - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Corridor - Penthouse - HS	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - Penthouse - HS	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	2,960		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,960	0.0	0	0	$0	$0	$0	0.0
Mechanical 366 Elevator - HS	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	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
Mechanical Boilers - New Wing - HS	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
Mechanical Boilers - New Wing - HS	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Storage 365 - HS	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	15	520		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	520	0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - Basement - HS	15	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	15	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Exterior Lighting - HS	2	High-Pressure Sodium: (1) 70W Lamp	Timeclock		95	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Ceiling Mount	Timeclock	21	4,380	0.0	648	0	$85	$594	$10	6.9
Exterior Lighting - HS	5	Incandescent: (1) 60W A19 Screw-In Lamp	Timeclock		60	4,380	3	Relamp	No	5	LED Lamps: A19 Lamps	Timeclock	9	4,380	0.0	1,117	0	$146	$86	$5	0.6
Exterior Lighting - HS	11	LED - Fixtures: Ceiling Mount	Photocell		15	4,380		None	No	11	LED - Fixtures: Ceiling Mount	Photocell	15	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Lighting - HS	5	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Photocell		100	4,380		None	No	5	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Photocell	100	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Lighting - HS	23	LED - Fixtures: Wall Pack	Photocell		40	4,380		None	No	23	LED - Fixtures: Wall Pack	Photocell	40	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior - Parking Lot - HS	20	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Photocell		100	4,380		None	No	20	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Photocell	100	4,380	0.0	0	0	$0	$0	$0	0.0
Auditorium - PA	9	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	9	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Auditorium - PA	6	LED Lamps: (24) 5W Screw-in Lamps	Wall Switch	S	120	3,500	4	None	Yes	6	LED Lamps: (24) 5W Screw-in Lamps	Occupancy Sensor	120	2,415	0.2	859	0	$111	$270	$35	2.1
Auditorium - PA	13	LED Lamps: (3) 5W Screw-in Lamps	Wall Switch	S	15	3,500	4	None	Yes	13	LED Lamps: (3) 5W Screw-in Lamps	Occupancy Sensor	15	2,415	0.0	233	0	$30	$270	$35	7.8
Auditorium - PA	9	LED Lamps: (6) 5W Screw-in Lamps	Wall Switch	S	30	3,500	4	None	Yes	9	LED Lamps: (6) 5W Screw-in Lamps	Occupancy Sensor	30	2,415	0.1	322	0	$41	$270	$35	5.7
Classroom 101 - PA	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	2,279	0	$293	$854	$195	2.2
Classroom 102 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Classroom 103 - PA	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	2,279	0	$293	$854	$195	2.2
Classroom 104 - PA	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	2,279	0	$293	$854	$195	2.2
Classroom 112 - PA	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.7	3,988	-1	$513	$1,292	$315	1.9
Classroom 114 - PA	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.7	3,988	-1	$513	$1,292	$315	1.9
Classroom 122 - PA	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.6	3,418	-1	$440	$1,146	$275	2.0
Classroom 124 - PA	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.3	1,709	0	$220	$708	$155	2.5
Classroom 126 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Classroom 128 - PA	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.7	3,988	-1	$513	$1,292	$315	1.9
Classroom 129 - PA	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.6	3,418	-1	$440	$1,146	$275	2.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Corridor - 1st Floor - PA	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - 1st Floor - PA	32	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,290	5	None	Yes	32	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.2	1,358	0	$175	$1,350	$1,120	1.3
Corridor 111 - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,290	0.0	264	0	$34	$73	$20	1.6
Electrical Room 1st Floor - PA	2	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	780	3	Relamp	No	2	LED Lamps: A19 Lamps	Wall Switch	9	780	0.1	88	0	$11	$34	$2	2.9
Kitchen - Walk In - PA	4	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	3,500	2, 4	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.2	1,047	0	$135	$545	$75	3.5
Lobby - Auditorium - PA	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
Lobby - Auditorium - PA	4	LED Lamps: (6) 5W Screw-in Lamps	Wall Switch	S	30	4,290	5	None	Yes	4	LED Lamps: (6) 5W Screw-in Lamps	High/Low Control	30	2,960	0.0	176	0	$23	$225	$140	3.8
Lounge 1st Floor - PA	4	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2, 4	Relamp & Reballast	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	2,094	0	$269	$743	$115	2.3
Main Office - PA	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.6	3,141	-1	$404	$980	$155	2.0
Office - 106 - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Office - 111 - PA	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,500		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,500	0.0	0	0	$0	$0	$0	0.0
Office - 111 Copier - PA	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.1	454	0	$58	$118	$20	1.7
Office - 111A - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - 111B - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - 111C - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - Custodians - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,500	0.0	127	0	$16	$37	$10	1.6
Office - Nurses - PA	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	1,139	0	$147	$562	$115	3.1
Office - Principal - PA	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.1	454	0	$58	$118	$20	1.7
Office - Principal - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Restroom - 106 - PA	1	Incandescent: (2) 60W A19 Screw-In Lamps	Wall Switch	S	120	3,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	18	3,500	0.1	393	0	$51	$34	$2	0.6
Restroom - Auditorium - PA	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	3,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	3,500	0.0	196	0	$25	$17	$1	0.6
Restroom - Custodian - PA	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	3,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	3,500	0.0	196	0	$25	$17	$1	0.6
Restroom - Lounge 1st - PA	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,500	0.0	62	0	$8	$33	$6	3.3
Restroom - Nurse - PA	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	3,500		None	No	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	9	3,500	0.0	0	0	$0	$0	$0	0.0
Restroom - Teachers 1st - PA	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,500	0.0	62	0	$8	$33	$6	3.3

	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
Stage - PA	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.4	1,940	0	$250	$708	$155	2.2
Stairs - Auditorium #1 - PA	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,290	3, 5	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.2	1,047	0	$135	$444	$165	2.1
Stairs - Auditorium #2 - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	4,290	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.1	396	0	$51	$73	$20	1.0
Stairs - Auditorium #2 - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,290	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.1	698	0	$90	$371	$110	2.9
Stairs #1 - PA	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch		15	4,290	5	None	Yes	2	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,960	0.0	42	0	$5	$225	$70	28.4
Stairs #1 - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,290	3, 5	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.1	349	0	$45	$73	$20	1.2
Stairs #2 - PA	6	LED - Linear Tubes: (1) 4' Lamp	Wall Switch		15	4,290	5	None	Yes	6	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,960	0.0	127	0	$16	$225	$210	0.9
Stairs #2 - PA	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch		176	4,290	2, 5	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.1	642	0	$83	$118	$20	1.2
Stairs #2 - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,290	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.1	698	0	$90	$371	$110	2.9
Stairs #3 - PA	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch		15	4,290	5	None	Yes	1	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,960	0.0	21	0	$3	$0	$0	0.0
Stairs #3 - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	4,290	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.1	396	0	$51	$298	$90	4.1
Stairs #3 - PA	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	4,290	3, 5	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.2	1,396	0	$180	$517	$220	1.7
Storage - Vault - PA	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	780		None	No	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	9	780	0.0	0	0	$0	$0	$0	0.0
Cafeteria - PA	26	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	3,500	2, 4	Relamp & Reballast	Yes	26	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	1.3	6,806	-1	$876	$2,328	$330	2.3
Cafeteria - PA	22	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	22	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	1.2	6,266	-1	$806	$2,147	$510	2.0
Classroom 201 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Classroom 202 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Classroom 203 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Classroom 204 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Classroom 210 - PA	4	LED Lamps: (12) 9W A19 Screw-In Lamps	Wall Switch	S	108	3,500	4	None	Yes	4	LED Lamps: (12) 9W A19 Screw-In Lamps	Occupancy Sensor	108	2,415	0.1	516	0	$66	$270	$35	3.5
Classroom 213 - PA	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.7	3,988	-1	$513	$1,292	$315	1.9
Classroom 214 - PA	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	2,279	0	$293	$854	$195	2.2
Classroom 215 - PA	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.6	3,418	-1	$440	$1,146	$275	2.0
Classroom 220 - PA	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.8	4,272	-1	$550	$1,365	$335	1.9
Classroom 221 - PA	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.8	4,272	-1	$550	$1,365	$335	1.9

	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 222 - PA	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.8	4,272	-1	$550	$1,365	$335	1.9
Classroom 223 - PA	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.6	3,418	-1	$440	$1,146	$275	2.0
Classroom 226 227 - PA	22	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	22	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	1.2	6,266	-1	$806	$2,147	$510	2.0
Classroom 228 - PA	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.3	1,709	0	$220	$708	$155	2.5
Classroom 229 - PA	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.7	3,988	-1	$513	$1,292	$315	1.9
Corridor - 2nd Floor - PA	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
Corridor - 2nd Floor - PA	35	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,290	5	None	Yes	35	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.2	1,485	0	$191	$1,350	$1,225	0.7
Janitorial 2nd - PA	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	780	2	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	780	0.1	101	0	$13	$118	$20	7.6
Kitchen #1 - PA	1	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	3,500	0.1	331	0	$43	$129	$20	2.6
Kitchen #2 - PA	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	3,500	4	None	Yes	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	2,415	0.0	21	0	$3	$116	$20	34.7
Kitchen #2 - PA	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,500	2, 4	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,415	0.2	834	0	$107	$373	$60	2.9
Library - PA	24	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	1.3	6,836	-1	$880	$2,293	$550	2.0
Office - 211a - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Office - 211a #1 - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - 211a #2 - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - 211b - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,415	0.1	323	0	$42	$189	$40	3.6
Office - 224 - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Office - Kitchen - PA	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	3,500		None	No	1	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	9	3,500	0.0	0	0	$0	$0	$0	0.0
Restroom - Female 2nd - PA	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	1,139	0	$147	$562	$115	3.1
Restroom - Male 2nd #1 - PA	2	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	S	63	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	2,415	0.1	304	0	$39	$400	$59	8.7
Restroom - Male 2nd #1 - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$416	$75	4.7
Restroom - Teachers 2nd - PA	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,500	0.0	62	0	$8	$33	$6	3.3
Classroom 312 - PA	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	2,279	0	$293	$854	$195	2.2
Classroom 313 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Classroom 314 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 315 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Classroom 316 - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.5	2,848	-1	$366	$1,000	$235	2.1
Corridor - 3rd Floor Classrooms - PA	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - 3rd Floor Classrooms - PA	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,290	5	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,960	0.1	509	0	$66	$450	$420	0.5
Lounge 310 - PA	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.3	1,709	0	$220	$708	$155	2.5
Office - 310 - PA	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.1	454	0	$58	$118	$20	1.7
Office - 310 - PA	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	854	0	$110	$489	$95	3.6
Office - 310A - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - 310B - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - 310C - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Office - 311 - PA	1	Incandescent: (2) 60W A19 Screw-In Lamps	Wall Switch	S	120	3,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	18	3,500	0.1	393	0	$51	$34	$2	0.6
Restroom - Teachers 3rd - PA	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,500	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,500	0.0	62	0	$8	$33	$6	3.3
Classroom B10 - PA	14	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2, 4	Relamp & Reballast	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	1.4	7,329	-2	$943	$1,927	$315	1.7
Classroom B12 - PA	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.6	3,418	-1	$440	$1,146	$275	2.0
Classroom B16 - PA	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.4	2,279	0	$293	$854	$195	2.2
Corridor - Basement - PA	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.5	3,491	-1	$449	$1,180	$550	1.4
Corridor - Basement Mech - PA	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3, 5	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,960	0.2	1,047	0	$135	$444	$165	2.1
Corridor - Weight Room - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,290	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,290	0.0	264	0	$34	$73	$20	1.6
Electrical Room - Boilers - PA	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Gymnasium - PA	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gymnasium - PA	37	Linear Fluorescent - T5: 4' T5 (28W) - 6L	Occupancy Sensor	S	180	2,960	3	Relamp	No	37	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	2,960	2.5	11,204	-2	$1,442	$4,053	$1,110	2.0
Gymnasium - Weight Room - PA	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.1	570	0	$73	$262	$60	2.8
Janitorial - Basement - PA	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	780	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	780	0.0	44	0	$6	$17	$1	2.9
Locker Room - Female - PA	1	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	S	50	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,500	0.0	127	0	$16	$65	$6	3.6
Locker Room - Female - PA	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.1	454	0	$58	$118	$20	1.7

	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
Locker Room - Female - PA	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3, 4	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.7	3,988	-1	$513	$1,292	$315	1.9
Locker Room - Male - PA	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	3,500	2, 4	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,415	0.2	1,047	0	$135	$353	$60	2.2
Mechanical - Boilers - PA	1	LED Lamps: (1) 100W Corn Bulb Screw-In Lamp	Wall Switch	S	100	780		None	No	1	LED Lamps: (1) 100W Corn Bulb Screw-In Lamp	Wall Switch	100	780	0.0	0	0	$0	$0	$0	0.0
Mechanical - Boilers - PA	9	LED - Fixtures: Wall Pack	Wall Switch	S	100	780		None	No	9	LED - Fixtures: Wall Pack	Wall Switch	100	780	0.0	0	0	$0	$0	$0	0.0
Mechanical - Condensate - PA	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Mechanical - Elevator Basement - PA	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Mechanical - Tunnel - PA	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	780		None	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	780	0.0	0	0	$0	$0	$0	0.0
Restroom - Female Locker - PA	1	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	S	50	3,500	2	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,500	0.0	127	0	$16	$65	$6	3.6
Restroom - Male Locker - PA	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,500	0.0	216	0	$28	$73	$20	1.9
Restroom - Unisex Basement - PA	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Wall Switch	S	9	3,500	4	None	Yes	2	LED Lamps: (1) 9W A19 Screw-In Lamp	Occupancy Sensor	9	2,415	0.0	21	0	$3	$116	$20	34.7
Storage - Gym #1 - PA	2	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	780	3, 4	Relamp	Yes	2	LED Lamps: A19 Lamps	Occupancy Sensor	9	538	0.1	92	0	$12	$150	$2	12.5
Storage - Gym #2 - PA	2	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	780	3, 4	Relamp	Yes	2	LED Lamps: A19 Lamps	Occupancy Sensor	9	538	0.1	92	0	$12	$150	$2	12.5
Storage Basement - PA	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	780	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	538	0.4	508	0	$65	$854	$160	10.6
Exterior Lighting - PA	4	LED - Fixtures: Wall Pack	Photocell		40	4,380		None	No	4	LED - Fixtures: Wall Pack	Photocell	40	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Lighting - PA	6	Metal Halide: (1) 150W Lamp	Timeclock		190	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	45	4,380	0.0	3,811	0	$499	$2,075	$300	3.6
Exterior Lighting - PA	5	Metal Halide: (1) 150W Lamp	Photocell		190	4,380	1	Fixture Replacement	No	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	45	4,380	0.0	3,176	0	$415	$1,729	$250	3.6
Exterior Lighting - PA	6	Metal Halide: (1) 70W Lamp	Photocell		95	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	21	4,380	0.0	1,945	0	$254	$1,237	$300	3.7

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Roof - HS	DOAS2 - Main Office - HS	1	Supply Fan	1.5	86.5%	No	Daikin		W	3,120	7	No	86.5%	Yes	1	0.4	1,514	0	$198	$3,887	$75	19.3
Roof - HS	DOAS2 - Main Office - HS	1	Return Fan	1.5	86.5%	No	Daikin		W	3,120	7	No	86.5%	Yes	1	0.4	1,514	0	$198	$3,887	$75	19.3
Roof - HS	Cafeteria - HS	1	Supply Fan	25.0	93.6%	Yes	Daikin		W	3,120		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	Cafeteria - HS	1	Return Fan	20.0	93.0%	Yes	Daikin		W	3,120		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	RTU1 - Auxiliary Gym - HS	1	Supply Fan	15.0	93.0%	Yes	Daikin		W	3,120		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	RTU1 - Auxiliary Gym - HS	3	Return Fan	1.0	85.5%	Yes	Daikin		W	3,120		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	RTU2 - Auxiliary Gym - HS	1	Supply Fan	15.0	93.0%	Yes	Daikin		W	3,120		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	RTU2 - Auxiliary Gym - HS	2	Return Fan	1.0	85.5%	Yes	Daikin		W	3,120		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	DOAS1 - New Wing - HS	1	Supply Fan	15.0	93.6%	No	Daikin		W	3,120	7	No	93.6%	Yes	1	4.3	13,988	0	$1,830	$9,177	$1,200	4.4
Roof - HS	DOAS1 - New Wing - HS	1	Return Fan	10.0	91.7%	No	Daikin		W	3,120	7	No	91.7%	Yes	1	3.0	9,518	0	$1,245	$6,697	$1,100	4.5
Mechanical Boilers - New Wing - HS	HV1 - Mechanical Boilers - New Wing - HS	1	Supply Fan	2.0	86.5%	No	Daikin		W	3,120	7	No	86.5%	Yes	1	0.6	2,018	0	$264	$4,182	$100	15.5
Mechanical Boilers - Basement - HS	HV2 - Mechanical Boilers - Basement - HS	1	Supply Fan	2.0	86.5%	No	Daikin		N	3,120	7	No	86.5%	Yes	1	0.6	2,018	0	$264	$4,182	$100	15.5
Print Shop 106 - HS	Print Shop 106 - HS	1	Supply Fan	2.0	86.5%	No	Daikin		W	3,120	7	No	86.5%	Yes	1	0.6	2,018	0	$264	$4,182	$100	15.5
Office - 104 - HS	Office - 104 - HS	1	Supply Fan	2.0	86.5%	No			W	3,120	7	No	86.5%	Yes	1	0.6	2,018	0	$264	$4,182	$100	15.5
Main Gymnasium - HS	Main Gymnasium - HS	4	Supply Fan	2.0	86.5%	No			W	3,120	7	No	86.5%	Yes	4	2.3	8,072	0	$1,056	$16,726	$400	15.5
Main Gymnasium - HS	Main Gymnasium - HS	4	Heating Hot Water Pump	1.0	85.5%	No			W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 102 - HS	Office - 102 - HS	1	Supply Fan	0.5	75.0%	No			W	3,120		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Classroom 113a - HS	113 Area - HS	1	Supply Fan	5.0	89.5%	Yes			W	3,120		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Classroom 113a - HS	113 Area - HS	1	Return Fan	3.0	89.5%	Yes			W	3,120		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
School Building	Fan Coil Units	44	Fan Coil Unit	0.1	60.0%	No			W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
School Building	Unit Heaters	9	Supply Fan	0.1	60.0%	No			W	3,120		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
School Building	Unit Ventilators	51	Supply Fan	0.3	65.0%	No			W	3,120		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior HVAC - HS	MUA1 - Classroom 103 - HS	1	Supply Fan	2.0	86.5%	No			W	3,120	7	No	86.5%	Yes	1	0.6	2,018	0	$264	$4,182	$100	15.5
Mechanical Boilers - Basement - HS	Orange Prep Academy	2	Boiler Feed Water Pump	3.0	86.5%	No			W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	Cooling System - New Wing - HS	2	Chilled Water Pump	7.5	91.7%	Yes			W	2,160		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	Glycol System - New Wing - HS	2	Chilled Water Pump	7.5	91.7%	Yes			W	2,160		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - Basement - HS	Cooling System - Old Wing - HS	2	Chilled Water Pump	7.5	91.0%	No			W	2,160	8	No	91.0%	Yes	2	2.8	9,960	0	$1,303	$11,890	$2,000	7.6
Mechanical Boilers - Basement - HS	Domestic Hot Water	2	Combustion Air Fan	0.1	60.0%	No			W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	Heating System - New Wing - HS	2	Heating Hot Water Pump	10.0	91.7%	Yes			W	2,745		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	Heating System - New Wing - HS	2	Heating Hot Water Pump	1.5	86.5%	Yes			W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	Domestic Hot Water	2	DHW Circulation Pump	0.1	60.0%	No			W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	Domestic Hot Water	1	DHW Circulation Pump	0.1	60.0%	No			W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - Basement - HS	Domestic Hot Water	1	DHW Circulation Pump	0.1	60.0%	No			W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - Basement - HS	Heating System - Old Wing - HS	3	Heating Hot Water Pump	10.0	91.7%	Yes			W	2,745		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - Basement - HS	Heating System - Old Wing - HS	3	Heating Hot Water Pump	2.0	86.5%	Yes			W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior - HS	Classroom 103 - Home Ec - HS	1	Kitchen Hood Exhaust Fan	5.0	87.5%	No			W	1,600	9	No	87.5%	Yes	1	0.0	4,140	26	$810	$5,209	$900	5.3
Roof - HS	Kitchen - HS	1	Kitchen Hood Exhaust Fan	7.5	91.0%	No			W	1,600	9	No	91.0%	Yes	1	0.0	6,009	39	$1,189	$5,940	$1,000	4.2
Roof - HS	Kitchen - HS	1	Kitchen Hood Exhaust Fan	7.5	91.0%	No			W	1,600	9	No	91.0%	Yes	1	0.0	6,009	39	$1,189	$5,940	$1,000	4.2
Mechanical 366 Elevator - HS	Elevator #1 - HS	1	Other	15.0	93.0%	No			W	400		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Elevator #2 - HS	Elevator #2 - HS	1	Other	15.0	93.0%	No			W	400		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - Basement - HS	Sump Pump	2	Process Pump	0.5	75.0%	No			W	2,745		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Boilers - New Wing - HS	Glycol Pump	1	Process Pump	0.5	75.0%	No			W	2,745		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - Basement - HS	Orange High School	2	Water Supply Pump	0.8	77.0%	No			W	2,745		No	77.0%	No		0.0	0	0	$0	$0	$0	0.0
Classroom Art 105 - HS	Classroom Art 105 - HS	2	Exhaust Fan	0.3	62.5%	No			W	3,120		No	62.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Sprinkler 179 - HS	Mechanical - Sprinkler 179 - HS	1	Exhaust Fan	0.5	75.0%	No			W	3,120		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - Main Office - HS	Roof - Main Office - HS	2	Exhaust Fan	0.3	62.5%	No			W	3,120		No	62.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	Mechanical Boilers - New Wing - HS	1	Exhaust Fan	0.8	78.0%	No			W	3,120		No	78.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - Basement - HS	Mechanical Boilers - Basement - HS	1	Exhaust Fan	0.8	78.0%	No			W	3,120		No	78.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	Orange High School	30	Exhaust Fan	0.5	75.0%	No			W	3,120		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	Orange High School	19	Exhaust Fan	0.3	62.5%	No			W	3,120		No	62.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	Orange High School	1	Exhaust Fan	1.0	82.5%	No			W	3,120		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	Orange High School	2	Exhaust Fan	2.0	84.0%	No			W	3,120	7	No	86.5%	Yes	2	1.2	4,373	0	$572	$8,363	$200	14.3
Roof - HS	Orange High School	2	Exhaust Fan	0.8	78.0%	No			W	3,120		No	78.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - HS	Main Gymnasium - HS	2	Exhaust Fan	3.0	86.5%	No			W	3,120	7	No	89.5%	Yes	2	1.9	6,420	0	$840	$9,110	$400	10.4
Mechanical Boilers - New Wing - HS	Air Compressor	1	Air Compressor	0.5	75.0%	No			W	400		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior HVAC - PA	Orange Prep Academy	3	Supply Fan	10.0	89.5%	No			B	2,600	7	No	91.7%	Yes	3	8.9	25,433	0	$3,327	$20,090	$3,300	5.0
Gymnasium - PA	AHU1 - Gymnasium - PA	1	Supply Fan	2.0	86.5%	No			W	2,600	7	No	86.5%	Yes	1	0.6	1,682	0	$220	$4,182	$100	18.6
Exterior HVAC - PA	310 Area - PA	1	Supply Fan	1.5	84.0%	No			W	2,600	7	No	86.5%	Yes	1	0.4	1,366	0	$179	$3,887	$75	21.3
Mechanical - Boilers - PA	Boiler #1	1	Combustion Air Fan	20.0	91.0%	No			W	1,000		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Boilers - PA	Boiler #2	1	Combustion Air Fan	20.0	92.4%	No			W	1,000		No	92.4%	No		0.0	0	0	$0	$0	$0	0.0
Office - Custodians - PA	Condensate System	2	Condensate Pump	0.3	62.5%	No			W	2,745		No	62.5%	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
Janitorial - Basement - PA	Condensate System	2	Condensate Pump	0.3	62.5%	No			B	2,745	6	Yes	73.4%	No		0.1	243	0	$32	$1,774	$0	55.8
Mechanical - Condensate - PA	Condensate System	2	Condensate Pump	0.3	62.5%	No			W	2,745		No	62.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Boilers - PA	Domestic Hot Water	1	DHW Circulation Pump	0.1	60.0%	No			W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Boilers - PA	Domestic Hot Water	1	DHW Circulation Pump	0.1	60.0%	No			W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior - PA	Kitchen - PA	1	Kitchen Hood Exhaust Fan	2.0	84.0%	No			W	1,600	9	No	85.5%	Yes	1	0.0	2,448	39	$723	$4,507	$100	6.1
Classroom B12 - PA	Sump Pump	1	Process Pump	0.5	75.0%	No			W	900		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Corridor - Basement Mech - PA	Sump Pump	1	Process Pump	0.5	75.0%	No			W	900		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Condensate - PA	Sump Pump	1	Process Pump	0.5	75.0%	No			W	900		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage Basement - PA	Sump Pump	1	Process Pump	0.5	75.0%	No			W	900		No	75.0%	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
Roof - HS	DOAS2 - Main Office - HS	1	Package Unit	3.00	65.00	16.90	0.8 Et	Daikin	DPS003AHMG2	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	Cafeteria - HS	1	Package Unit	63.00	800.00	10.50	0.8 Et	Daikin	RPS063DSAS6	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	RTU1 - Auxiliary Gym - HS	1	Package Unit	40.00	640.00	10.30	0.8 Et	Daikin	MPS040FG2	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	RTU2 - Auxiliary Gym - HS	1	Package Unit	30.00	240.00	10.30	0.8 Et	Daikin	MPS030FG2	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 115b - HS	Classroom 115b - HS	1	Electric Resistance Heat		25.59		1 COP	Dayton		W		No							0.0	0	0	$0	$0	$0	0.0
Corridor 115 - HS	Corridor 115 - HS	2	Electric Resistance Heat		10.24		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
Mechanical - Sprinkler 179 - HS	Mechanical - Sprinkler 179 - HS	1	Electric Resistance Heat		11.26		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 123b - HS	Classroom 123b - HS	1	Electric Resistance Heat		10.24		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
Exterior HVAC - HS	MUA1 - Classroom 103 - HS	1	Forced Air Furnace		150.40		0.8 Et	Captive Aire		W		No							0.0	0	0	$0	$0	$0	0.0
Exterior HVAC - HS	Classroom 102 - HS	1	Split-System	4.00		10.00		Unitary Products	C1048BBD1V	B	10	Yes	1	Split-System	4.00		16.00		0.9	630	0	$82	$7,415	$420	84.9
Exterior HVAC - HS	Print Shop - HS	1	Split-System	3.00		10.00			RA1360AC1NB	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior HVAC - HS	Print Shop - HS	1	Split-System	10.00		11.20		Daikin	DX11TA1203AB	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	113 Area - HS	1	Split-System	15.00		11.00		Daikin	RCS015DYYYY	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 107 - HS	Classroom 107 - HS	1	Window AC	1.75		10.40		Friedrich		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 108 - HS	Classroom 108 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 109 - HS	Classroom 109 - HS	1	Window AC	1.92		9.40		Friedrich		B	10	Yes	1	Window AC	1.92		12.00		0.3	186	0	$24	$1,501	$0	61.8
Classroom 112 - HS	Classroom 112 - HS	1	Window AC	1.96		8.50		Carrier		B	10	Yes	1	Window AC	1.96		12.00		0.4	282	0	$37	$1,541	$0	41.7
Classroom 115c - HS	Classroom 115c - HS	1	Window AC	1.92		9.40		Friedrich		B	10	Yes	1	Window AC	1.92		12.00		0.3	186	0	$24	$1,501	$0	61.8
Classroom 115d - HS	Classroom 115d - HS	1	Window AC	1.92		9.40		Friedrich		B	10	Yes	1	Window AC	1.92		12.00		0.3	186	0	$24	$1,501	$0	61.8
Classroom 201 - HS	Classroom 201 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0

		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 (kBtu/hr)	Cooling Mode Efficiency (SEER/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
Classroom 203 - HS	Classroom 203 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 205 - HS	Classroom 205 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 207 - HS	Classroom 207 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 209 - HS	Classroom 209 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 211 - HS	Classroom 211 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 213a - HS	Classroom 213a - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 213b - HS	Classroom 213b - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 215 - HS	Classroom 215 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 216 - HS	Classroom 216 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 219 - HS	Classroom 219 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 221 - HS	Classroom 221 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 222 - HS	Classroom 222 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 223 - HS	Classroom 223 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 225 - HS	Classroom 225 - HS	1	Window AC	1.75		10.40		Friedrich		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 225 - HS	Classroom 225 - HS	1	Window AC	1.50		9.00		Westinghouse		B	10	Yes	1	Window AC	1.50		12.00		0.3	175	0	$23	$1,094	$0	47.8
Classroom 227 - HS	Classroom 227 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 229 - HS	Classroom 229 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 231 - HS	Classroom 231 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 233 - HS	Classroom 233 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 235 - HS	Classroom 235 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0

		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 (kBtu/hr)	Cooling Mode Efficiency (SEER/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
Classroom 239 - HS	Classroom 239 - HS	1	Window AC	1.92		9.40		Friedrich		B	10	Yes	1	Window AC	1.92		12.00		0.3	186	0	$24	$1,501	$0	61.8
Classroom 241 - HS	Classroom 241 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 245 - HS	Classroom 245 - HS	1	Window AC	1.92		9.40		Friedrich		B	10	Yes	1	Window AC	1.92		12.00		0.3	186	0	$24	$1,501	$0	61.8
Classroom 247 - HS	Classroom 247 - HS	1	Window AC	1.92		9.40		Friedrich		B	10	Yes	1	Window AC	1.92		12.00		0.3	186	0	$24	$1,501	$0	61.8
Classroom 248 - HS	Classroom 248 - HS	1	Window AC	1.96		9.40		Friedrich		W		No							0.0	0	0	$0	$0	$0	0.0
Office - 220 - HS	Office - 220 - HS	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Electrical Room - 113 - HS	Electrical Room - 113 - HS	1	Window AC	0.83		10.00		MovinCool		W		No							0.0	0	0	$0	$0	$0	0.0
Office - Tech - HS	Office - Tech - HS	1	Window AC	0.83		10.00		MovinCool		W		No							0.0	0	0	$0	$0	$0	0.0
Exterior - Courtyard - HS	Orange High School	1	Ductless Mini-Split AC	3.00		15.90		Daikin	RK36NMVJUA	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior - Courtyard - HS	Classroom 116 - HS	1	Ductless Mini-Split AC	2.00		19.00		Daikin	RK24AXVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior - Courtyard - HS	IDF Room - HS	1	Ductless Mini-Split AC	3.00		19.30		Mitsubishi	PUY-A36NKA7	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior HVAC - HS	Classroom 103 - HS	1	Ductless Mini-Split HP	1.53	21.50	18.00	10 HSPF	Samsung	MH050FXCA2A	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-4A & ACCU-4B	2	Ductless Mini-Split AC	1.50		18.50		Daikin	RK18AXVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-8A & ACCU-8B	2	Ductless Mini-Split AC	1.50		18.50		Daikin	RK18AXVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-10	1	Ductless Mini-Split AC	1.50		18.50		Daikin	RK18AXVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-14	1	Ductless Mini-Split AC	1.00		19.00		Daikin	RK12AXVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-5	1	Ductless Mini-Split HP	2.00	24.00	18.60	10 HSPF	Daikin	RX24RMVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-11	1	Ductless Mini-Split HP	2.00	24.00	20.00	10.6 HSPF	Daikin	RXS24VLJU	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-12	1	Ductless Mini-Split HP	4.00	52.00	18.00	10 HSPF	Daikin	RXTQ48TAVJUA	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-13	1	Ductless Mini-Split HP	2.00	24.00	18.60	10 HSPF	Daikin	RXL24UMVJUA	W		No							0.0	0	0	$0	$0	$0	0.0

		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 (kBtu/hr)	Cooling Mode Efficiency (SEER/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
Roof - HS	ACCU-6A & ACCU-6B	2	Ductless Mini-Split AC	1.50		18.50		Daikin	RK18AXVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	ACCU-7A & ACCU-7B	2	Ductless Mini-Split AC	1.50		18.50		Daikin	RK18AXVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior HVAC - PA	Orange Prep Academy	3	Split-System	28.00		8.70		Carrier	50TJ-028	B	10	Yes	3	Split-System	28.00		12.50		17.6	12,328	0	$1,613	$156,096	$7,140	92.4
Exterior HVAC - PA	310 Area - PA	1	Package Unit	4.79	93.00	15.20	0.81 Et	Carrier	48HCEA06A2A	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 102 - PA	Classroom 102 - PA	1	Window AC	1.00		11.30		Frigidaire		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 103 - PA	Classroom 103 - PA	1	Window AC	1.00		11.30				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 112 - PA	Classroom 112 - PA	1	Window AC	0.83		10.80		Amana		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 114 - PA	Classroom 114 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 122 - PA	Classroom 122 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 124 - PA	Classroom 124 - PA	1	Window AC	0.42		10.00				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 126 - PA	Classroom 126 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 128 - PA	Classroom 128 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Lounge 1st Floor - PA	Lounge 1st Floor - PA	1	Window AC	2.00		9.40		Friedrich		W		No							0.0	0	0	$0	$0	$0	0.0
Main Office - PA	Main Office - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 111A - PA	Office - 111A - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 111B - PA	Office - 111B - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 111C - PA	Office - 111C - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Office - Nurses - PA	Office - Nurses - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Office - Principal - PA	Office - Principal - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 201 - PA	Classroom 201 - PA	1	Window AC	0.42		11.00				W		No							0.0	0	0	$0	$0	$0	0.0

		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 (kBtu/hr)	Cooling Mode Efficiency (SEER/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
Classroom 202 - PA	Classroom 202 - PA	1	Window AC	0.42		11.00				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 203 - PA	Classroom 203 - PA	1	Window AC	0.42		11.00				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 204 - PA	Classroom 204 - PA	1	Window AC	0.42		11.00				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 213 - PA	Classroom 213 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 215 - PA	Classroom 215 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 220 - PA	Classroom 220 - PA	1	Window AC	0.42		11.00				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 221 - PA	Classroom 221 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 222 - PA	Classroom 222 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 226 227 - PA	Classroom 226 227 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 228 - PA	Classroom 228 - PA	1	Window AC	1.13		10.80		Friedrich		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 229 - PA	Classroom 229 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Library - PA	Library - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 211a #1 - PA	Office - 211a #1 - PA	1	Window AC	1.00		10.00		Whirlpool		B	10	Yes	1	Window AC	1.00		12.00		0.1	70	0	$9	$942	$0	102.9
Office - 211a #2 - PA	Office - 211a #2 - PA	1	Window AC	0.42		11.00		Frigidaire		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 312 - PA	Classroom 312 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 313 - PA	Classroom 313 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 314 - PA	Classroom 314 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 315 - PA	Classroom 315 - PA	1	Window AC	1.75		10.40				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 316 - PA	Classroom 316 - PA	1	Window AC	1.75		10.40				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 HVAC - HS	High School - Old Wing	1	Air-Cooled Scroll Chiller	100.00	Carrier	30RBB100	B		No							0.0	0	0	$0	$0	$0	0.0
Roof - HS	High School - New Wing	2	Air-Cooled Scroll Chiller	91.00	Daikin	AGZ091E	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 Boilers - Basement - HS	High School - Old Wing	3	Condensing Hot Water Boiler	2,375	PK	C-2500	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	High School - New Wing	2	Condensing Hot Water Boiler	1,920	PK	C-2000T	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical - Boilers - PA	Prep Academy	2	Forced Draft Steam Boiler	16,738	Easco	FPS-500	W		No						0.0	0	0	$0	$0	$0	0.0

Pipe Insulation Recommendations

		Recommendation Inputs			Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Boilers - Basement - HS	DHW - High School & Prep Academy	11	30	0.75	0.0	0	10	$106	$358	$60	2.8
Mechanical Boilers - Basement - HS	Chilled Water Distribution	11	15	2.00	0.0	437	0	$57	$246	$30	3.8

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 Boilers - Basement - HS	High School - Old Wing & Prep Academy	2	Storage Tank Water Heater (> 50 Gal)	AO Smith	GPVX-75L 210	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical Boilers - New Wing - HS	High School - New Wing	2	Storage Tank Water Heater (> 50 Gal)	Rheem	GHE100SU-300A	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
Orange High School	12	27	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	13	$132	$194	$97	0.7
Orange Prep Academy	12	24	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	11	$117	$172	$86	0.7

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 - 1st Floor - HS	1	Cooler (35F to 55F)	Bohn		13, 14	Yes	No	Yes	0.1	1,743	0	$228	$2,584	$195	10.5
Kitchen - Walk In - PA	2	Medium Temp Freezer (0F to 30F)	Heatcraft	LSF094	13, 14	Yes	No	Yes	0.1	1,915	0	$251	$4,561	$310	17.0

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
Orange High School	4	Refrigerator Chest			No		No	0.0	0	0	$0	$0	$0	0.0
Orange High School	1	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)			No		No	0.0	0	0	$0	$0	$0	0.0
Orange High School	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)			Yes		No	0.0	0	0	$0	$0	$0	0.0
Orange High School	3	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)			No		No	0.0	0	0	$0	$0	$0	0.0
Orange High School	2	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)			Yes		No	0.0	0	0	$0	$0	$0	0.0
Orange High School	5	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)			Yes		No	0.0	0	0	$0	$0	$0	0.0
Orange Prep Academy	1	Refrigerator Chest			No		No	0.0	0	0	$0	$0	$0	0.0
Orange Prep Academy	1	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)			No		No	0.0	0	0	$0	$0	$0	0.0
Orange Prep Academy	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)			Yes		No	0.0	0	0	$0	$0	$0	0.0
Orange Prep Academy	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)			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 - 1st Floor - HS	1	Ice Making Head (≥450 lbs/day), Batch	Hoshizaki	KM-1300SAH	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
Classroom 103 - Home Ec - HS	1	Electric Convection Oven (Full Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - 1st Floor - HS	2	Gas Convection Oven (Full Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - Snack Room - HS	1	Gas Convection Oven (Half Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - 1st Floor - HS	1	Gas Fryer			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - 1st Floor - HS	2	Gas Griddle (3 Feet Width)			No		No	0.0	0	0	$0	$0	$0	0.0
Classroom 103 - Home Ec - HS	1	Electric Griddle (4 Feet Width)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - Snack Room - HS	1	Insulated Food Holding Cabinet (3/4 Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - 1st Floor - HS	2	Insulated Food Holding Cabinet (Full Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - 2nd Floor - HS	3	Insulated Food Holding Cabinet (Full Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Classroom 103 - Home Ec - HS	2	Electric Convection Oven (Half Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - 1st Floor - HS	1	Gas Rack Oven (Single)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen #2 - PA	2	Gas Convection Oven (Full Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen #2 - PA	1	Gas Griddle (3 Feet Width)			No		No	0.0	0	0	$0	$0	$0	0.0
Cafeteria - PA	2	Insulated Food Holding Cabinet (Full Size)			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
Orange High School	2	Clothes Dryer	1,800	No		
Orange High School	2	Clothes Washer	500	No		
Orange High School	7	Coffee Machine	500	No		
Orange High School	267	Desktop	120	No		
Orange High School	2	Kiln	16,000	No		
Orange High School	28	Microwave	1,000	No		
Orange High School	1	CNC Milling Machine	600	No		
Orange High School	2	Paper Shredder	146	No		
Orange High School	71	Printer (Medium/Small)	450	No		
Orange High School	20	Printer/Copier (Large)	600	No		
Orange High School	1	Projector	240	No		
Orange High School	26	Refrigerator (Mini)	174	No		
Orange High School	4	Refrigerator (Residential)	340	No		
Orange High School	5	Serving Table (Chilled/Heated)	3,000	No		
Orange High School	90	Smart Board	215	Yes		
Orange High School	5	Television	224	No		
Orange High School	1	Toaster	600	No		
Orange High School	1	Toaster Oven	600	No		
Orange High School	2	Water Cooler	192	No		
Orange High School	11	Water Fountain	370	No		
Orange Prep Academy	85	Desktop	120	No		
Orange Prep Academy	4	Fan (Large)	200	No		
Orange Prep Academy	10	Microwave	1,000	No		
Orange Prep Academy	1	Paper Shredder	146	No		
Orange Prep Academy	45	Printer (Medium/Small)	450	No		
Orange Prep Academy	7	Printer/Copier (Large)	600	No		
Orange Prep Academy	2	Projector	240	No		
Orange Prep Academy	6	Refrigerator (Mini)	174	No		
Orange Prep Academy	3	Refrigerator (Residential)	340	No		
Orange Prep Academy	3	Serving Table (Chilled/Heated)	3,000	No		
Orange Prep Academy	34	Smart Board	215	Yes		
Orange Prep Academy	3	Television	224	No		
Orange Prep Academy	2	Water Cooler	192	No		
Orange Prep Academy	4	Water Fountain	370	No		

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Orange High School	4	Refrigerated	15	Yes	0.7	6,447	0	$843	$920	$200	0.9
Orange Prep Academy	1	Non-Refrigerated	15	Yes	0.0	343	0	$45	$230	$0	5.1
Orange Prep Academy	4	Refrigerated	15	Yes	0.7	6,447	0	$843	$920	$200	0.9

Custom (High Level) Measure Analysis

Retro-Commissioning Study

Building Square Footage	246,169	Fuel Utility Rate	$10.304 MMBtu
Percent of Conditioned Area Impacted	100%	Blended Electric Utility Rate	$0.131 kWh

Existing Conditions						Proposed Conditions					Energy Impact & Financial Analysis										
Description	Area(s)/System(s) Served	Remaining Useful Life	Total HVAC Motor Usage kWh	Total HVAC Electric Usage kWh	Total HVAC Fuel Usage MMBtu	Description	% Savings HVAC Motor Usage kWh	% Savings HVAC Electric Usage kWh	% Savings HVAC Fuel Usage MMBtu	Estimated Cost per Sqft	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Simple Payback w/ Incentives in Years
HVAC Controls Not Currently Optimized	HVAC Equipment & Systems	3	646,310	306,895	11,663	Retro-Commissioning Study	8%	8%	8%	$0.40	0.00	76,256	933	$19,589	$98,500	$0	$0	$0	$98,500	5.03	5.03

Gas Tank Water Heater to HPWH

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

Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis										
Description	Area(s)/System(s) Served	SF of Area Served	Fuel Type	Input Capacity per Unit (MBH)	Tank Capacity per Unit (Gal)	Description	COP	Tank Capacity per Unit (Gal)	Estimated Unit Cost	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Payback w/ Incentives in Years
Storage Tank Water Heater (>50 Gal)	High School - Old Wing & Prep Academy	40,000	Natural Gas	76.0	75	Heat Pump Water Heater	2.5	75	$6,332.68	0.00	-26,260	280	-$550	$6,333	$0	$0	$0	$6,333	-11.51	-11.51
Storage Tank Water Heater (>50 Gal)	High School - New Wing	40,000	Natural Gas	300.0	100	Heat Pump Water Heater	2.5	100	$7,899.03	0.00	-26,260	280	-$550	$7,899	$0	$0	$0	$7,899	-14.36	-14.36

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]

Orange High School & Prep Academy (campus)

Primary Property Type: K-12 School
Gross Floor Area (ft²): 246,169
Built: 1925

For Year Ending: November 30, 2021
Date Generated: January 11, 2023

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Orange High School & Prep Academy (campus) 400 Lincoln / Central Avenue Orange, New Jersey 07050	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: 24510573

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
79.8 kBtu/ft²

Source EUI
133.9 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	12,572,999 (64%)
Electric - Grid (kBtu)	7,061,549 (36%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	86.2
National Median Source EUI (kBtu/ft²)	144.7
% Diff from National Median Source EUI	-7%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	1,283

Signature & Stamp of Verifying Professional

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

LP Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-____
_____

Professional Engineer or Registered Architect Stamp (if applicable)

APPENDIX C: GLOSSARY

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

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

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