Local Government Energy Audit Report

Memorial High School & Annex A

April 1, 2022

Prepared for:

West New York Board of Education
5501 Park Avenue
West New York, New Jersey 07093

Prepared by:

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Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. 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.

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

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

Table of Contents

ENERGY EFFICIENCY INCENTIVE & REBATE TRANSITION

For the purposes of your LGEA, estimated incentives and rebates are included as placeholders for planning purposes. New Jersey utilities are rolling out their own energy efficiency programs, which your project may be eligible for depending on individual measures, quantities, and size of the building.

In 2018, Governor Murphy signed into law the landmark legislation known as the Clean Energy Act. The law called for a significant overhaul of New Jersey's clean energy systems by building sustainable infrastructure in order to fight climate change and reduce carbon emissions, which will in turn create well-paying local jobs, grow the state's economy, and improve public health while ensuring a cleaner environment for current and future residents.

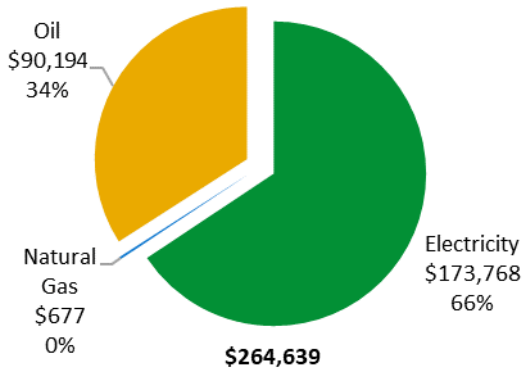
These "next generation" energy efficiency programs feature new ways of managing and delivering programs historically administered by New Jersey's Clean Energy Program™ (NJCEP). All of the investor-owned gas and electric utility companies will now also offer complementary energy efficiency programs and incentives directly to customers like you. NJCEP will still offer programs for new construction, renewable energy, the Energy Savings Improvement Program (ESIP), and large energy users.

New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website.

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Memorial High School & Annex A. 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: $264,639 Electricity: 1,428,803 kWh Natural Gas: 139 Therms No. 2 Fuel Oil: 44,680 Gallons	
ENERGY STAR® Benchmarking Score	88 *(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.

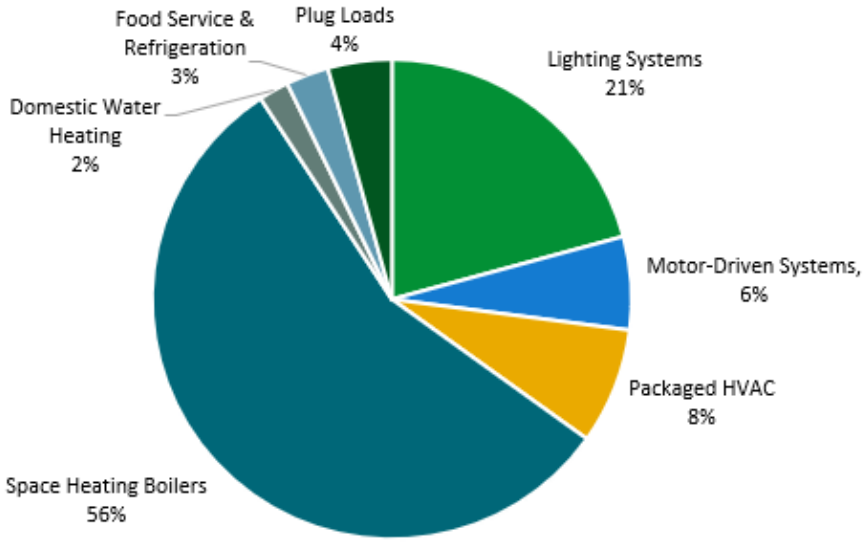


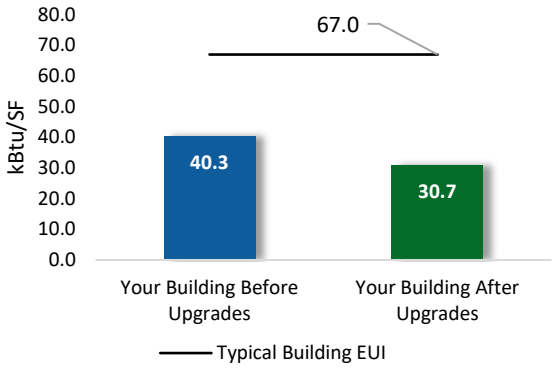
Figure 1 - Energy Use by System

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.

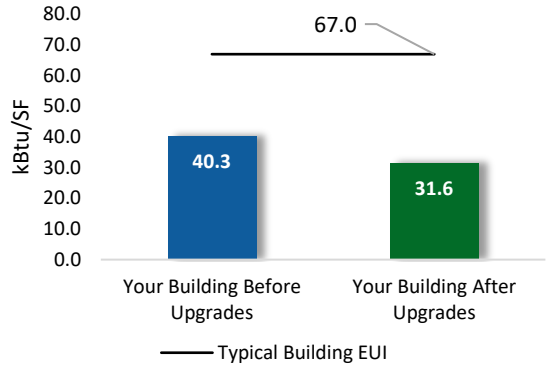
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$587,672
Potential Rebates & Incentives[1]	$48,009
Annual Cost Savings	$80,361
Annual Energy Savings	Electricity: 581,622 kWh No. 2 Fuel Oil: 4,768 Gallons
Greenhouse Gas Emission Savings	347 Tons
Simple Payback	6.7 Years
Site Energy Savings (all utilities)	24%



Scenario 2: Cost Effective Package[2]

Installation Cost	$392,795
Potential Rebates & Incentives	$46,249
Annual Cost Savings	$76,367
Annual Energy Savings	Electricity: 573,987 kWh No. 2 Fuel Oil: 3,250 Gallons
Greenhouse Gas Emission Savings	326 Tons
Simple Payback	4.5 Years
Site Energy Savings (all utilities)	22%



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			**351,035**	**51.3**	**-146**	**$40,570**	**$78,719**	**$19,503**	**$59,216**	**1.5**	**329,652**
ECM 1	Install LED Fixtures	Yes	753	0.0	0	$92	$415	$50	$365	4.0	759
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	87	0.1	0	$10	$129	$20	$109	10.8	82
ECM 3	Retrofit Fixtures with LED Lamps	Yes	350,194	51.3	-146	$40,468	$78,175	$19,433	$58,742	1.5	328,811
Lighting Control Measures			**112,945**	**16.5**	**-47**	**$13,048**	**$77,284**	**$21,800**	**$55,484**	**4.3**	**106,008**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	93,678	14.2	-39	$10,822	$57,484	$7,030	$50,454	4.7	87,924
ECM 5	Install High/Low Lighting Controls	Yes	19,268	2.3	-8	$2,226	$19,800	$14,770	$5,030	2.3	18,084
Motor Upgrades			**134**	**0.0**	**0**	**$16**	**$1,619**	**$0**	**$1,619**	**99.0**	**135**
ECM 6	Premium Efficiency Motors	No	134	0.0	0	$16	$1,619	$0	$1,619	99.0	135
Variable Frequency Drive (VFD) Measures			**51,899**	**13.9**	**26**	**$6,692**	**$35,829**	**$4,675**	**$31,154**	**4.7**	**56,527**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	46,626	13.5	0	$5,671	$22,961	$4,400	$18,561	3.3	46,952
ECM 8	Install VFDs on Heating Water Pumps	No	3,995	0.4	0	$486	$10,172	$225	$9,947	20.5	4,023
ECM 9	Install VFDs on Kitchen Hood Fan Motors	Yes	1,279	0.0	26	$535	$2,696	$50	$2,646	4.9	5,552
Unitary HVAC Measures			**3,099**	**3.1**	**0**	**$377**	**$31,650**	**$1,460**	**$30,190**	**80.1**	**3,121**
ECM 10	Install High Efficiency Air Conditioning Units	No	3,099	3.1	0	$377	$31,650	$1,460	$30,190	80.1	3,121
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**210**	**$3,065**	**$149,763**	**$0**	**$149,763**	**48.9**	**34,432**
ECM 11	Install High Efficiency Hot Water Boilers	No	0	0.0	170	$2,475	$70,083	$0	$70,083	28.3	27,799
ECM 12	Install High Efficiency Steam Boilers	No	0	0.0	41	$591	$79,679	$0	$79,679	134.9	6,633
HVAC System Improvements			**621**	**0.0**	**0**	**$76**	**$29**	**$8**	**$21**	**0.3**	**625**
ECM 13	Install Pipe Insulation	Yes	621	0.0	0	$76	$29	$8	$21	0.3	625
Domestic Water Heating Upgrade			**15,570**	**0.0**	**0**	**$1,894**	**$803**	**$448**	**$355**	**0.2**	**15,679**
ECM 14	Install Low-Flow DHW Devices	Yes	15,570	0.0	0	$1,894	$803	$448	$355	0.2	15,679
Food Service & Refrigeration Measures			**669**	**0.0**	**0**	**$81**	**$1,977**	**$115**	**$1,862**	**22.9**	**674**
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	262	0.0	0	$32	$303	$40	$263	8.3	264
ECM 16	Refrigeration Controls	No	407	0.0	0	$49	$1,674	$75	$1,599	32.3	410
Custom Measures			**45,650**	**0.0**	**617**	**$14,542**	**$210,000**	**$0**	**$210,000**	**14.4**	**146,956**
ECM 17	Installation of an Energy Management System	Yes	45,650	0.0	617	$14,542	$210,000	$0	$210,000	14.4	146,956
TOTALS (COST EFFECTIVE MEASURES)			**573,987**	**81.3**	**450**	**$76,367**	**$392,795**	**$46,249**	**$346,546**	**4.5**	**651,688**
TOTALS (ALL MEASURES)			**581,622**	**84.9**	**661**	**$80,361**	**$587,672**	**$48,009**	**$539,663**	**6.7**	**693,808**

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

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

Figure 2 – Evaluated Energy Improvements

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

1.1 Planning Your Project

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

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

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and 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.

For details on these programs please visit New Jersey's Clean Energy Program website or contact your utility provider.

Options from Around the State

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

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

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

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

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Memorial High School & Annex A. 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 28, 2021, TRC performed an energy audit at Memorial High School & Annex A located in West New York, New Jersey. TRC met with Rick Solares and Michael Calderara to review the facility operations and help focus our investigation on specific energy-using systems.

Memorial High School and Annex A are both four-story buildings that combine to a total of 274,799 square feet. The buildings are adjacent to Annex B, together comprising the whole of Memorial High School. However, Annex B is served by dedicated utilities and is therefore considered in a separate report. Spaces covered in this report include classrooms and offices, gymnasiums, locker rooms, an auditorium, a cafeteria, a kitchen, a library, computer labs, conference rooms, lounges, corridors, stairwells, restrooms, storage rooms, and electrical and mechanical spaces.

Lighting for the facility is provided mainly by linear fluorescent T8 fixtures. Two boilers and rooftop units provide heating to most spaces while cooling is mainly provided by window air conditioning (AC) units. The facility has a diesel generator to provide emergency backup electricity.

2.2 Building Occupancy

The facility is occupied from July to September, with the school year ending for students in July and restarting in September. Weekend occupancy varies, and the facility closes at 11:00 PM on weekdays. During a typical day, the facility in combination with Annex B is occupied by approximately 300 staff and 2,000 students.

Building Name	Weekday/Weekend	Operating Schedule
Memorial High School	Weekday	5:30 AM - 11:00 PM
	Weekend	Varies

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

Memorial High School and Annex A are both three-floor buildings with a basement. Building walls are concrete block over structural steel with a brick facade. The roof of each building is flat, covered with a grey membrane, and in good 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 no evidence of excess wear. Exterior doors have aluminum frames and are in good condition with undamaged door seals. Overall, the building envelope appears in good condition.

Building Walls

Building Windows

Entrance & Exit Doors

Roof

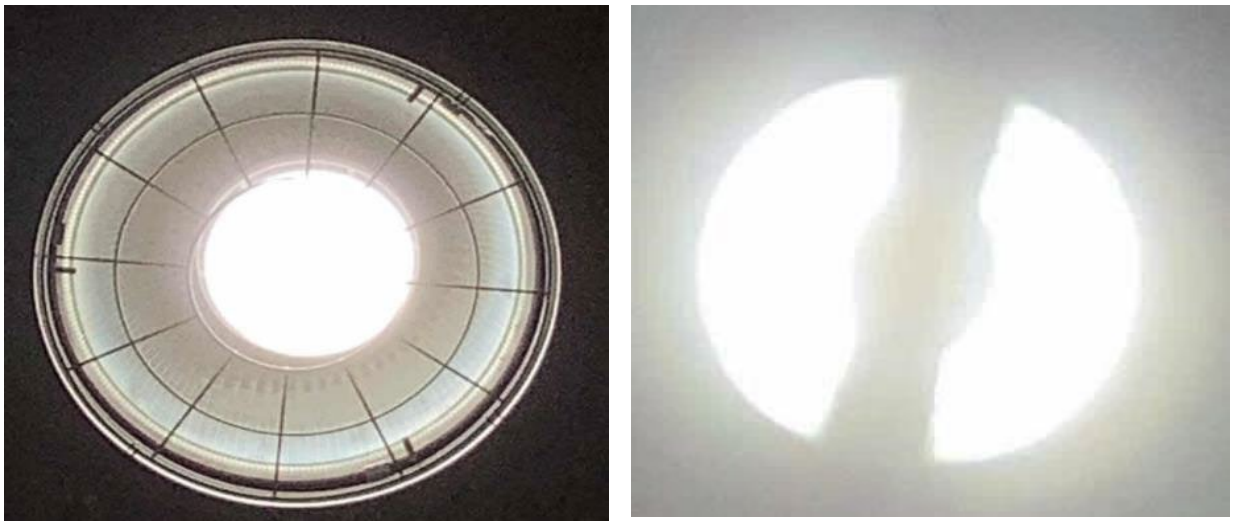
2.4 Lighting Systems

The primary interior lighting system uses 32-Watt fluorescent T8 lamps. Fixture types include 1-lamp, 2-lamp, 3-lamp, and 4-lamp, 2-foot and 4-foot long recessed, surface mounted, and pendant fixtures with linear and U-bend tube lamps. Some fluorescent fixtures have been converted to operate LED tube lamps. Gymnasium fixtures use manually controlled high-bay LED lamps, and LED fixtures have been installed in additional areas. Auditorium fixtures use manually controlled incandescent lamps. Compact fluorescent (CFL), fluorescent T12, and incandescent sources are also used throughout. Exit signs use LED sources.

Typically, CFLs at this site use 26-watts and 42-watts, incandescent lamps require between 40 to 200-watts, and the T12 fixtures use eight-foot 75-watt lamps.

Interior light fixtures are mainly controlled by manual wall switches, with Annex A restrooms utilizing wall-mounted occupancy sensors. All light fixtures are in good condition. Interior lighting levels were generally sufficient. Exterior fixtures include canopy and wall mounted CFL, incandescent, and 200W MH fixtures. Exterior fixtures are timer controlled.

Fluorescent T8 Fixtures



Gymnasium High Bay Fixtures

Auditorium Incandescent Lamps

Exterior MH & CFL Fixtures

2.5 Air Handling Systems

Unit Ventilators (UV)

There are three Bard® vertical UVs that condition Classrooms 213, 215, and 218. These UVs are heat pump (HP) units with heating and cooling and are equipped with supply fan motors and pneumatically controlled outside air dampers. These units each have a cooling capacity of 4.5-tons with an efficiency rating of 11.2 EER, and a heating capacity of 54 MBh with an efficiency rating of 3.6 COP. Installed in 2016, they appear to be in good operating condition. The units are controlled using a wall mounted thermostat.

Unit Ventilator & Controls

Packaged Units

Annex A is heated by two rooftop package units (RTU1 & RTU3) equipped with constant speed supply fan and return fan motors. RTU1 has an estimated total heating capacity of 133 kW with a 20-hp supply fan and 10 hp return fan, while RTU3 has an estimated total heating capacity of 69 kW with a 10-hp supply fan and a 5-hp return fan. There were two additional RTUs found during the site visit, RTU2 & RTU4, but they are no longer in service.

The main building has one package unit serving computer lab 301, equipped with a 3/4 hp constant speed supply fan. The unit has a cooling capacity of 5-tons with a 12 EER efficiency rating. The units serving Annex A are in poor condition and are operating beyond their standard useful lifetime, while the main building unit is in fair condition.

Packaged Units

Unitary Electric Heating, Ventilation, and Air Conditioning (HVAC) Equipment

Various areas throughout Memorial High School and Annex A are conditioned by unitary electric HVAC equipment, including three split systems serving computer lab and server rooms, and five mini-split AC units, five mini-split HP units, and 68 window AC units serving the classrooms, offices, lounges, cafeteria, and library.

Cooling capacities for the split-system, mini-split AC, and window AC units vary from 0.67-tons to 5-tons, with efficiencies ranging from 9.4 EER to 13 EER. The mini-split HP units have cooling capacities that range from 1.5-tons to 4-tons with efficiencies between 13.6 EER to 18.9 EER, and heating capacities that vary from 20 MBh to 54 MBh with efficiencies between 8.7 HSPF to 11.4 HSPF.

Many of the window AC units are ENERGY STAR® labeled while the split systems, mini-split AC, and mini-split HP units are standard efficiency. The window AC, mini-split AC, and mini-split HP units are mainly in good condition, and the split systems are in fair condition. Older units judged to be operating beyond their useful life were evaluated for replacement.

Window AC Unit & Split System

2.6 Heating Hot Water & Steam Systems

The main building's heating system consists of one Weil McLain® non-condensing oil-fired hot water boiler and one Weil McLain oil-fired steam boiler. The hot water boiler, with an estimated output capacity of 4,090 MBh, was installed in 2000. The steam boiler was installed in 1980 and has an estimated output capacity of 4,650 MBh. Each boiler is equipped with a combustion air fan. The burners are fully modulating, each with a nominal efficiency of 80%. The boilers are configured in a lead-lag control scheme. Both boilers are required under high load conditions, and both are in fair condition. There is a service contract in place.

Steam is converted to hot water using a heat exchanger. There are two 1.5 hp and two 3/4 hp condensate pumps associated with the steam boiler.

The boilers are configured in a constant flow primary distribution with three 1.5 hp and two fractional hp constant speed hot water pumps operating with a manual control scheme. The boilers provide hot water to fin tube radiators.

Hot Water & Steam Boilers

Hot Water Pumps

Condensate Pumps

2.7 Domestic Hot Water

Hot water is currently produced by two 750 MBh gas-fired boilers equipped with two 200-gallon storage tank; however, it was previously produced by two 119-gallon, 24 kW electric storage water heaters. The newer water heaters were installed in 2019 and are in good condition.

A fractional circulation pump distributes water to end uses, operating continuously. The domestic hot water pipes are partially insulated, and the insulation is in good condition.

Note, we have included usage for the electric hot water heaters in this report because they were operational during the period that coincides with the historical electricity usage that we analyzed.

Gas-fired Boiler & Circulation Pump

2.8 Food Service Equipment

The kitchen has all-electric equipment that is used to prepare meals for students. Most cooking is done using an electric-fired convection oven. Bulk prepared foods are held in an electric holding cabinet. Equipment is standard 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 Convection Oven & Holding Cabinet

2.9 Refrigeration

The facility has five stand-up refrigerators with glass doors, a refrigerator chest, and a freezer chest. Only one stand-up refrigerator was noted to be highly efficient; all equipment appeared in good condition.

The older kitchen walk-in refrigerator has an estimated 0.5-ton compressor located above the unit and a one-fan evaporator. The newer walk-in refrigerator, located in the cafeteria storage room, has an estimated 0.55-ton compressor located outside of the kitchen and a one-fan evaporator

The walk-in medium temperature freezer has an estimated 0.64-ton compressor located outside of the kitchen and a two-fan evaporator.

The newer walk-in refrigerator and the walk-in freezer units are equipped with evaporator fan controls, and the freezer also has electric defrost controls.

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

Stand-up & Walk-in Refrigerators

2.10 Plug Load & Vending Machines

You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area as well as energy efficient best practices.

There are approximately 282 computer workstations throughout the facility. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as smart boards and projectors and typical office loads such as copiers, printers, microwaves, coffee machines, and mini fridges. Additional loads include shop equipment, a tread mill, a kiln, residential-type cooking, and other items commonly found in high schools.

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

Copier Machine & Residential Style Refrigerator

2.11 Water-Using Systems

There are 32 restrooms with toilets, urinals, and sinks. Faucet flow rates are at 2.2 gallons per minute (gpm) or higher.

Typical Restroom Sinks

2.12 On-Site Generation

Memorial High School and Annex A share a dedicated rooftop photovoltaic (PV) array, separate from the Annex B building, with approximately 273 panels. The total array size and install date were not provided by the applicant. This system provides approximately 7% of the electricity used. Some electricity generated by the panels is sold back to the grid.

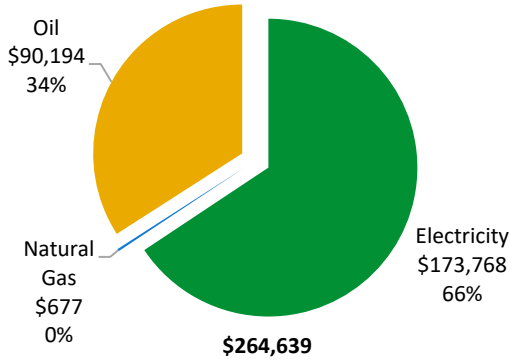
Memorial High School and Annex A have an emergency generator that, in the event of a power outage, serves the entire building and is only used for emergency needs.

Rooftop Solar Panels

3 Energy Use and Costs

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

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	1,428,803 kWh	$173,768
Natural Gas	139 Therms	$677
No. 2 Fuel Oil	44,680 Gallons	$90,194
Total		**$264,639**



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.

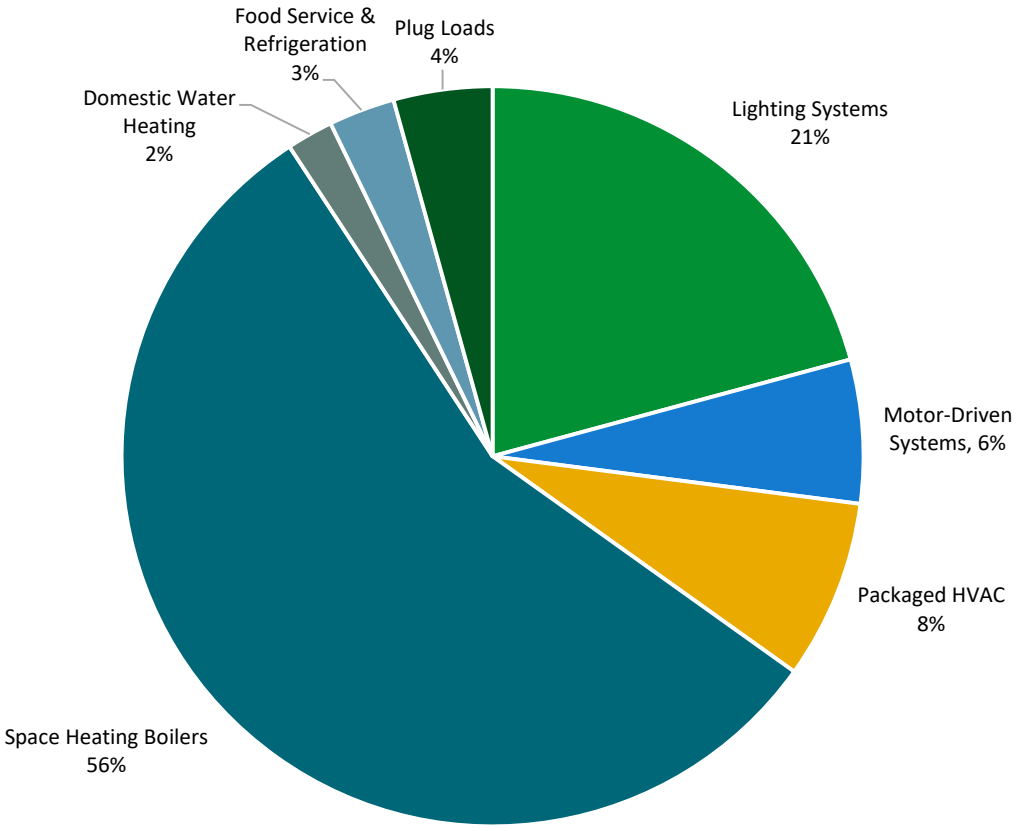
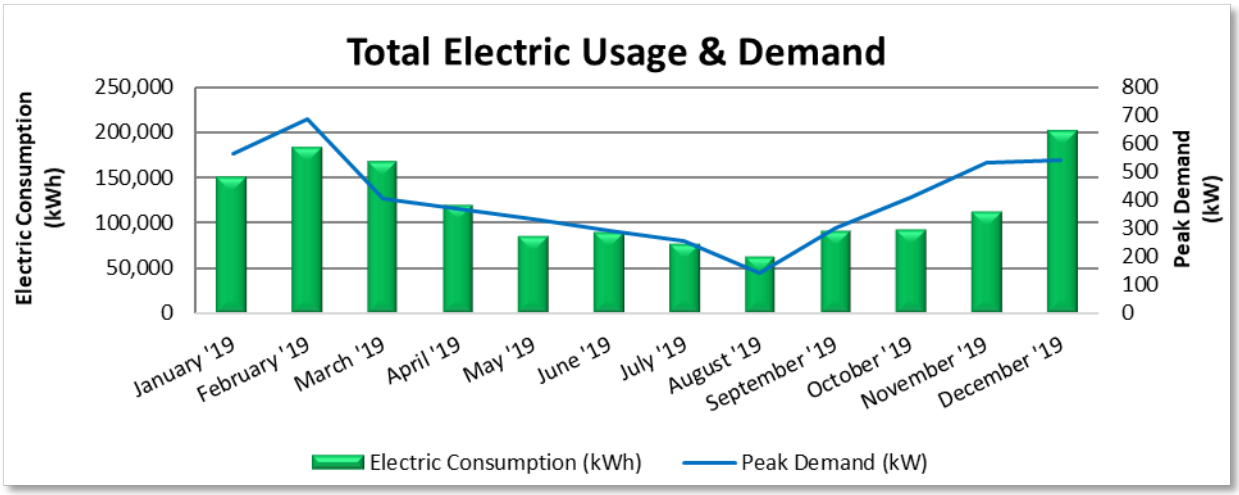
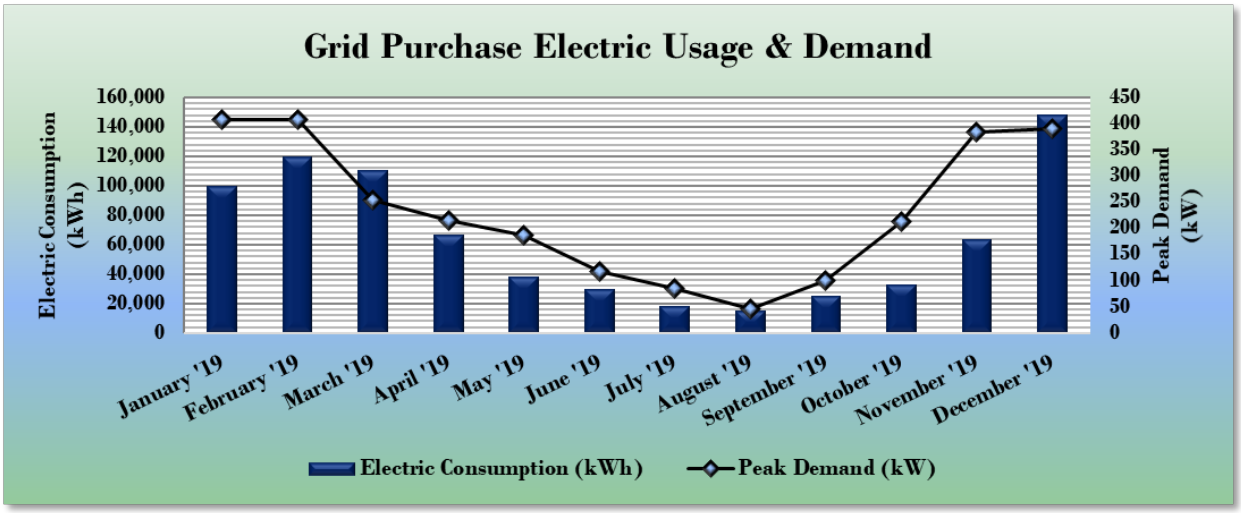


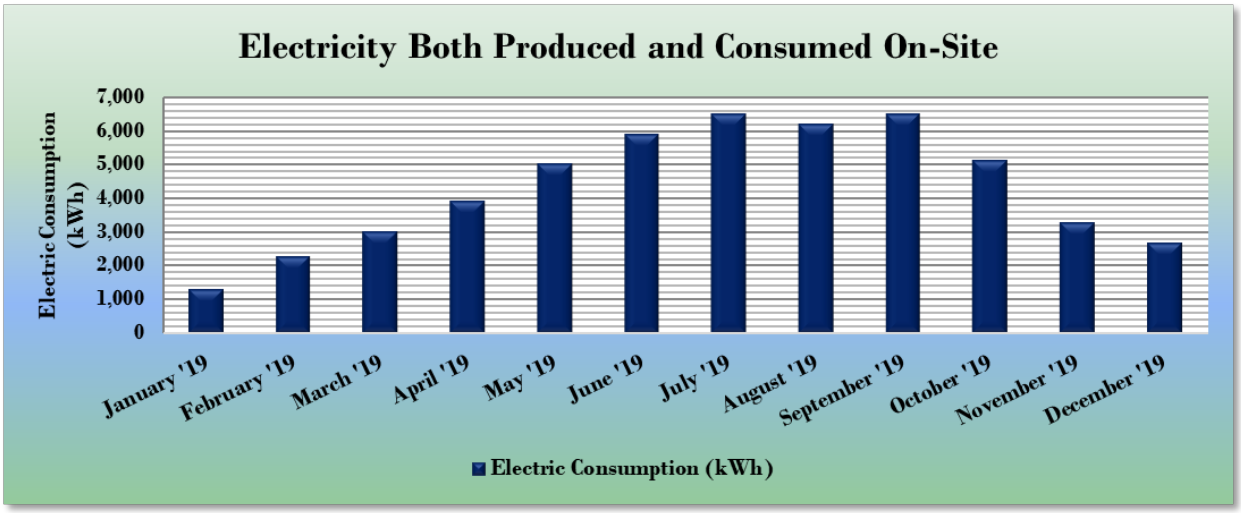
Figure 4 - Energy Balance

3.1 Electricity

PSE&G delivers electricity under rate class Large Power & Lighting Secondary (LPLS), with electric production provided by East Coast Power & Gas, a third-party supplier.





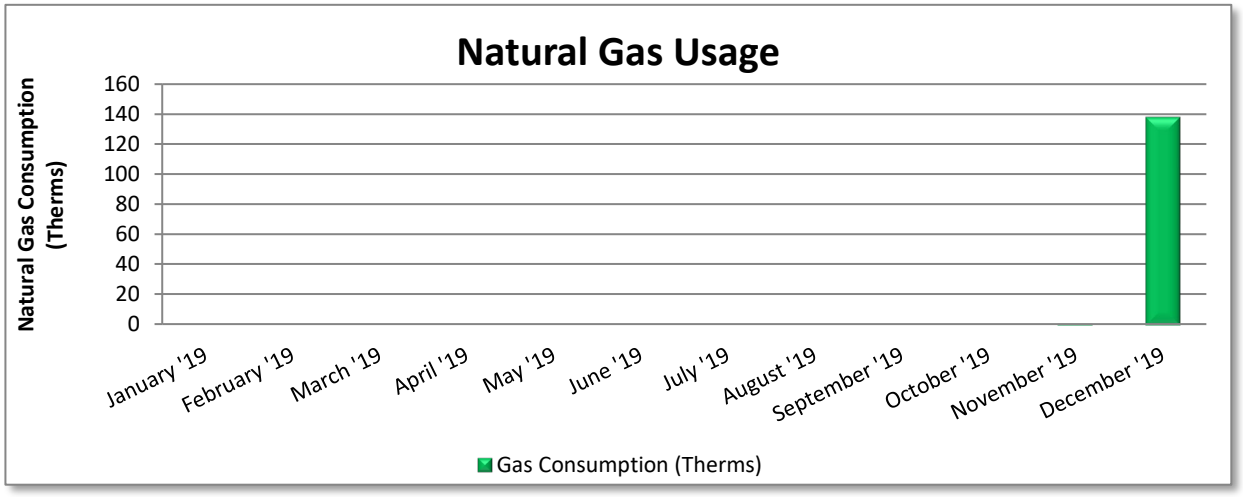


Notes:

- Peak demand of 688 kW occurred in February '19.
- Average demand over the past 12 months was 402 kW.
- The average electric cost over the past 12 months was $0.122/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.
- On-site generation is through a PPA, and the site purchases the generated electricity from G&S Hudson Solar LLC. Some of the electricity generated on-site is used on-site and the remainder is exported to the grid.
- The first graph shows combined electricity consumption, the second graph shows energy consumed from the grid, and the third graph reflects energy produced by the solar panels and consumed on site.
- The solar meter does not capture kW load and is not displayed on the third graph.

3.2 Natural Gas

PSE&G delivers natural gas under rate class Large Volume Gas (LVG), with natural gas supply provided by East Coast Power & Gas, a third-party supplier.



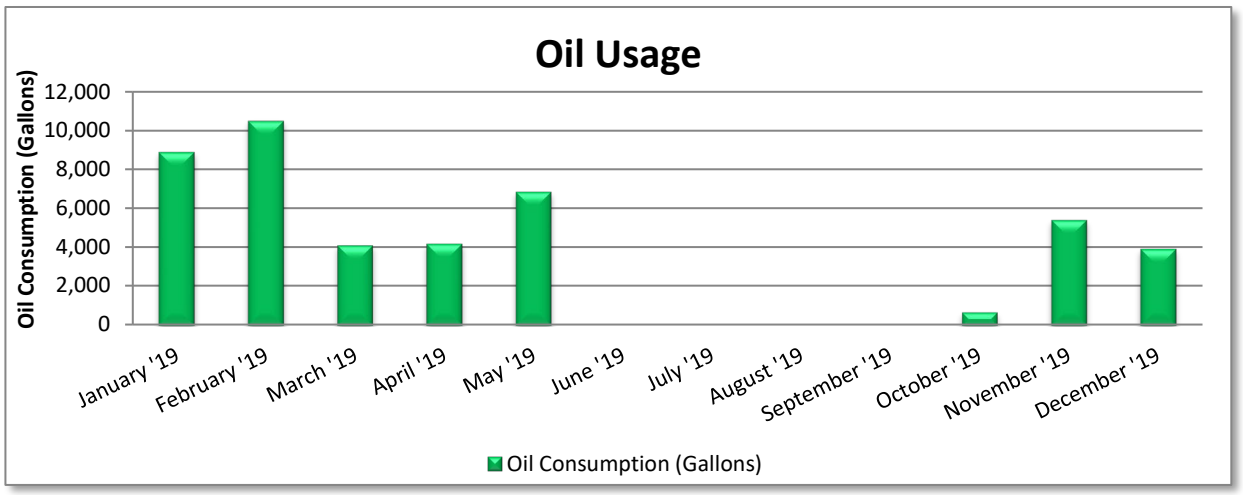
Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
1/17/19	31	0	$46
2/15/19	29	0	$46
3/19/19	32	0	$46
4/17/19	29	0	$46
5/17/19	30	0	$46
6/18/19	32	0	$46
7/18/19	30	0	$46
8/16/19	29	0	$46
9/17/19	32	0	$46
10/16/19	29	0	$47
11/14/19	29	1	$48
12/17/19	33	138	$166
Totals	**365**	**139**	**$677**
Annual	**365**	**139**	**$677**

Notes:

- The average gas cost for the past 12 months is $4.878/therm; however, this cost is heavily weighted by fixed costs which were applied by the utility during periods during which no gas was consumed. We have calculated the cost of natural gas at $1.20/therm based on December 2019 charges.
- Natural gas usage is indicated only at the end of this 12-month period because the facility switched from electric domestic hot water (DHW) heaters to gas-fired DHW heaters at the end of 2019.

3.3 No. 2 Fuel Oil

Rachles/Michele's Oil Co. delivers No. 2 fuel oil to the project site.



No. 2 Fuel Oil Billing Data			
Period Ending	**Days in Period**	**Oil Usage (Gallons)**	**Fuel Cost**
1/17/19	31	8,912	$17,420
2/15/19	29	10,513	$20,635
3/19/19	32	4,124	$8,493
4/17/19	29	4,201	$8,716
5/17/19	30	6,863	$14,390
6/18/19	32	0	$0
7/18/19	30	0	$0
8/16/19	29	0	$0
9/17/19	32	0	$0
10/16/19	29	688	$1,253
11/14/19	29	5,428	$10,876
12/17/19	33	3,952	$8,411
Totals	**365**	**44,680**	**$90,194**
Annual	**365**	**44,680**	**$90,194**

Notes:

- The average No. 2 fuel oil cost for the past 12 months is $2.019/Gallon, which is the blended rate used throughout the analysis.
- Fuel deliveries do not necessarily correspond to periods of use.

3.4 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	88

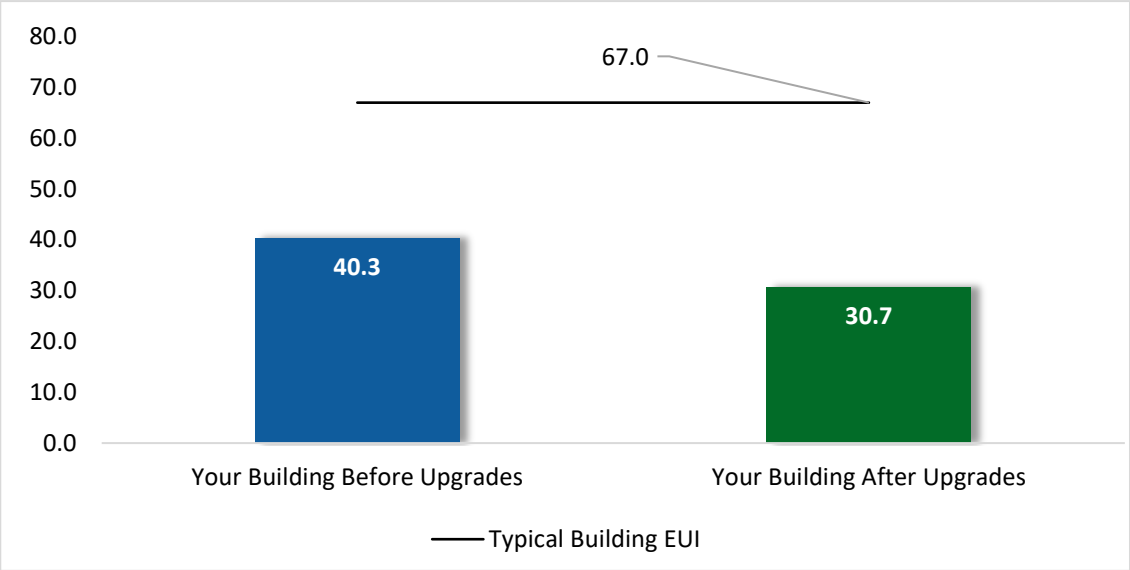


Figure 5 - Energy Use Intensity Comparison[3]

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. A number of factors can cause a building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

[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 we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

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

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[4].

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

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements 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 are based on previously run state rebate programs. New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website. Some measures and proposed upgrades may be eligible for higher incentives than those shown below.

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			**351,035**	**51.3**	**-146**	**$40,570**	**$78,719**	**$19,503**	**$59,216**	**1.5**	**329,652**
ECM 1	Install LED Fixtures	Yes	753	0.0	0	$92	$415	$50	$365	4.0	759
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	87	0.1	0	$10	$129	$20	$109	10.8	82
ECM 3	Retrofit Fixtures with LED Lamps	Yes	350,194	51.3	-146	$40,468	$78,175	$19,433	$58,742	1.5	328,811
Lighting Control Measures			**112,945**	**16.5**	**-47**	**$13,048**	**$77,284**	**$21,800**	**$55,484**	**4.3**	**106,008**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	93,678	14.2	-39	$10,822	$57,484	$7,030	$50,454	4.7	87,924
ECM 5	Install High/Low Lighting Controls	Yes	19,268	2.3	-8	$2,226	$19,800	$14,770	$5,030	2.3	18,084
Motor Upgrades			**134**	**0.0**	**0**	**$16**	**$1,619**	**$0**	**$1,619**	**99.0**	**135**
ECM 6	Premium Efficiency Motors	No	134	0.0	0	$16	$1,619	$0	$1,619	99.0	135
Variable Frequency Drive (VFD) Measures			**51,899**	**13.9**	**26**	**$6,692**	**$35,829**	**$4,675**	**$31,154**	**4.7**	**56,527**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	46,626	13.5	0	$5,671	$22,961	$4,400	$18,561	3.3	46,952
ECM 8	Install VFDs on Heating Water Pumps	No	3,995	0.4	0	$486	$10,172	$225	$9,947	20.5	4,023
ECM 9	Install VFDs on Kitchen Hood Fan Motors	Yes	1,279	0.0	26	$535	$2,696	$50	$2,646	4.9	5,552
Unitary HVAC Measures			**3,099**	**3.1**	**0**	**$377**	**$31,650**	**$1,460**	**$30,190**	**80.1**	**3,121**
ECM 10	Install High Efficiency Air Conditioning Units	No	3,099	3.1	0	$377	$31,650	$1,460	$30,190	80.1	3,121
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**210**	**$3,065**	**$149,763**	**$0**	**$149,763**	**48.9**	**34,432**
ECM 11	Install High Efficiency Hot Water Boilers	No	0	0.0	170	$2,475	$70,083	$0	$70,083	28.3	27,799
ECM 12	Install High Efficiency Steam Boilers	No	0	0.0	41	$591	$79,679	$0	$79,679	134.9	6,633
HVAC System Improvements			**621**	**0.0**	**0**	**$76**	**$29**	**$8**	**$21**	**0.3**	**625**
ECM 13	Install Pipe Insulation	Yes	621	0.0	0	$76	$29	$8	$21	0.3	625
Domestic Water Heating Upgrade			**15,570**	**0.0**	**0**	**$1,894**	**$803**	**$448**	**$355**	**0.2**	**15,679**
ECM 14	Install Low-Flow DHW Devices	Yes	15,570	0.0	0	$1,894	$803	$448	$355	0.2	15,679
Food Service & Refrigeration Measures			**669**	**0.0**	**0**	**$81**	**$1,977**	**$115**	**$1,862**	**22.9**	**674**
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	262	0.0	0	$32	$303	$40	$263	8.3	264
ECM 16	Refrigeration Controls	No	407	0.0	0	$49	$1,674	$75	$1,599	32.3	410
Custom Measures			**45,650**	**0.0**	**617**	**$14,542**	**$210,000**	**$0**	**$210,000**	**14.4**	**146,956**
ECM 17	Installation of an Energy Management System	Yes	45,650	0.0	617	$14,542	$210,000	$0	$210,000	14.4	146,956
TOTALS			**581,622**	**84.9**	**661**	**$80,361**	**$587,672**	**$48,009**	**$539,663**	**6.7**	**693,808**

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

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

Figure 6 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**351,035**	**51.3**	**-146**	**$40,570**	**$78,719**	**$19,503**	**$59,216**	**1.5**	**329,652**
ECM 1	Install LED Fixtures	753	0.0	0	$92	$415	$50	$365	4.0	759
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	87	0.1	0	$10	$129	$20	$109	10.8	82
ECM 3	Retrofit Fixtures with LED Lamps	350,194	51.3	-146	$40,468	$78,175	$19,433	$58,742	1.5	328,811
Lighting Control Measures		**112,945**	**16.5**	**-47**	**$13,048**	**$77,284**	**$21,800**	**$55,484**	**4.3**	**106,008**
ECM 4	Install Occupancy Sensor Lighting Controls	93,678	14.2	-39	$10,822	$57,484	$7,030	$50,454	4.7	87,924
ECM 5	Install High/Low Lighting Controls	19,268	2.3	-8	$2,226	$19,800	$14,770	$5,030	2.3	18,084
Variable Frequency Drive (VFD) Measures		**47,904**	**13.5**	**26**	**$6,206**	**$25,657**	**$4,450**	**$21,207**	**3.4**	**52,504**
ECM 7	Install VFDs on Constant Volume (CV) Fans	46,626	13.5	0	$5,671	$22,961	$4,400	$18,561	3.3	46,952
ECM 9	Install VFDs on Kitchen Hood Fan Motors	1,279	0.0	26	$535	$2,696	$50	$2,646	4.9	5,552
HVAC System Improvements		**621**	**0.0**	**0**	**$76**	**$29**	**$8**	**$21**	**0.3**	**625**
ECM 13	Install Pipe Insulation	621	0.0	0	$76	$29	$8	$21	0.3	625
Domestic Water Heating Upgrade		**15,570**	**0.0**	**0**	**$1,894**	**$803**	**$448**	**$355**	**0.2**	**15,679**
ECM 14	Install Low-Flow DHW Devices	15,570	0.0	0	$1,894	$803	$448	$355	0.2	15,679
Food Service & Refrigeration Measures		**262**	**0.0**	**0**	**$32**	**$303**	**$40**	**$263**	**8.3**	**264**
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors	262	0.0	0	$32	$303	$40	$263	8.3	264
Custom Measures		**45,650**	**0.0**	**617**	**$14,542**	**$210,000**	**$0**	**$210,000**	**14.4**	**146,956**
ECM 17	Installation of an Energy Management System	45,650	0.0	617	$14,542	$210,000	$0	$210,000	14.4	146,956
TOTALS		**573,987**	**81.3**	**450**	**$76,367**	**$392,795**	**$46,249**	**$346,546**	**4.5**	**651,688**

* - All incentives presented in this table are included as placeholders for planning purposes and based on previously run state 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		**351,035**	**51.3**	**-146**	**$40,570**	**$78,719**	**$19,503**	**$59,216**	**1.5**	**329,652**
ECM 1	Install LED Fixtures	753	0.0	0	$92	$415	$50	$365	4.0	759
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	87	0.1	0	$10	$129	$20	$109	10.8	82
ECM 3	Retrofit Fixtures with LED Lamps	350,194	51.3	-146	$40,468	$78,175	$19,433	$58,742	1.5	328,811

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

ECM 1: Install LED Fixtures

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

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

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

Affected building areas: exterior metal halide fixture.

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: fluorescent fixtures with T12 tubes in the tech storage room.

ECM 3: Retrofit Fixtures with LED Lamps

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

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, CFL fixtures, or fluorescent fixtures with 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		**112,945**	**16.5**	**-47**	**$13,048**	**$77,284**	**$21,800**	**$55,484**	**4.3**	**106,008**
ECM 4	Install Occupancy Sensor Lighting Controls	93,678	14.2	-39	$10,822	$57,484	$7,030	$50,454	4.7	87,924
ECM 5	Install High/Low Lighting Controls	19,268	2.3	-8	$2,226	$19,800	$14,770	$5,030	2.3	18,084

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, computer labs, conference room, lounges, gymnasiums, auditorium, library, locker rooms, kitchen, cafeteria, 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.

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

Affected building areas: hallways and stairwells.

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 an occupant approaches.

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		**134**	**0.0**	**0**	**$16**	**$1,619**	**$0**	**$1,619**	**99.0**	**135**
ECM 6	Premium Efficiency Motors	134	0.0	0	$16	$1,619	$0	$1,619	99.0	135

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
Boiler Room - MHS	HW Boiler	1	Combustion Air Fan	5.0	Combustion Air Fan
Boiler Room - MHS	Steam Boiler	1	Combustion Air Fan	2.0	Combustion Air Fan

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

4.4 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**51,899**	**13.9**	**26**	**$6,692**	**$35,829**	**$4,675**	**$31,154**	**4.7**	**56,527**
ECM 7	Install VFDs on Constant Volume (CV) Fans	46,626	13.5	0	$5,671	$22,961	$4,400	$18,561	3.3	46,952
ECM 8	Install VFDs on Heating Water Pumps	3,995	0.4	0	$486	$10,172	$225	$9,947	20.5	4,023
ECM 9	Install VFDs on Kitchen Hood Fan Motors	1,279	0.0	26	$535	$2,696	$50	$2,646	4.9	5,552

VFDs 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 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 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.

For air handlers with direct expansion 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: RTU-1 & RTU-3.

ECM 8: Install VFDs on Heating Water Pumps

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

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

Affected pumps: HWP-1, HWP-2, & HWP-3.

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		**3,099**	**3.1**	**0**	**$377**	**$31,650**	**$1,460**	**$30,190**	**80.1**	**3,121**
ECM 10	Install High Efficiency Air Conditioning Units	3,099	3.1	0	$377	$31,650	$1,460	$30,190	80.1	3,121

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 split-systems, package units, mini-splits, and window AC units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 10: Install High Efficiency AC Units

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

Affected units: mini-split AC unit serving the boiler room, package unit and split system serving computer lab 301, the 2nd floor server room split system, and various office window AC units.

4.6 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**210**	**$3,065**	**$149,763**	**$0**	**$149,763**	**48.9**	**34,432**
ECM 11	Install High Efficiency Hot Water Boilers	0	0.0	170	$2,475	$70,083	$0	$70,083	28.3	27,799
ECM 12	Install High Efficiency Steam Boilers	0	0.0	41	$591	$79,679	$0	$79,679	134.9	6,633

ECM 11: Install High Efficiency Hot Water Boilers

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

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

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

ECM 12: Install High Efficiency Steam Boilers

We evaluated replacing the older inefficient steam boiler with a high efficiency steam boiler. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

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

In the case of the steam boiler, have your design team consider whether a second hot water boiler would be appropriate for your site since the output from the existing steam boiler is converted to hot water and distributed through a hydronic system.

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

4.7 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		**621**	**0.0**	**0**	**$76**	**$29**	**$8**	**$21**	**0.3**	**625**
ECM 13	Install Pipe Insulation	621	0.0	0	$76	$29	$8	$21	0.3	625

ECM 13: Install Pipe Insulation

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

Note that electricity savings is indicated based on the fuel type used during the baseline period. Natural gas is currently used for domestic hot water heating; therefore, gas savings are predicted for this measure and not electricity. The projected natural gas savings is approximately 3 MMBtu for a savings of $31 annually at a simple payback of 0.7 years.

Affected Systems: domestic hot water piping in the boiler room.

4.8 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		**15,570**	**0.0**	**0**	**$1,894**	**$803**	**$448**	**$355**	**0.2**	**15,679**
ECM 14	Install Low-Flow DHW Devices	15,570	0.0	0	$1,894	$803	$448	$355	0.2	15,679

ECM 14: 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

Note that electricity savings is indicated based on the fuel type used during the baseline period. Natural gas is currently used for domestic hot water heating; therefore, gas savings are predicted for this measure and not electricity. The projected natural gas savings is approximately 64 MMBtu for a savings of $771 annually at a simple payback of 0.5 years.

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.

4.9 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		**669**	**0.0**	**0**	**$81**	**$1,977**	**$115**	**$1,862**	**22.9**	**674**
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors	262	0.0	0	$32	$303	$40	$263	8.3	264
ECM 16	Refrigeration Controls	407	0.0	0	$49	$1,674	$75	$1,599	32.3	410

ECM 15: Refrigerator/Freezer Case Electrically Commutated Motors

Replace shaded pole or permanent split capacitor motors with electronically commutated (EC) motors in the older walk-in cooler. 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 16: Refrigeration Controls

We evaluated installing additional controls to optimize the operation of the older walk-in cooler. 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 the control measure accounts for reduction in compressor and fan operating hours as well as reduction in the refrigeration heat load as appropriate.

4.10 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		**45,650**	**0.0**	**617**	**$14,542**	**$210,000**	**$0**	**$210,000**	**14.4**	**146,956**
ECM 17	Installation of an Energy Management System	45,650	0.0	617	$14,542	$210,000	$0	$210,000	14.4	146,956

ECM 17: Installation of an Energy Management System (EMS)

Most larger facilities have some type of EMS, which provides for centralized, remote control and monitoring of HVAC equipment and sometimes lighting or other building systems. An EMS utilizes a system of temperature and pressure sensors that obtain feedback about field conditions and provide signals to control systems that adjust HVAC system operation for optimal functioning. Thirty years ago, most control systems were pneumatic systems driven by compressed air, with pneumatic thermostats and air driven actuators for valves and dampers. Pneumatic controls have largely been replaced by direct digital control (DDC) systems, but many pneumatic systems remain. Contemporary DDC systems afford tighter controls and enhanced monitoring and trending capabilities as compared to the older systems.

Often smaller facilities are not equipped with central controls. For many small sites, it has been less costly to install distributed local controls, such as programmable thermostats and timeclocks, rather than centralized DDC. Local controls do a reasonably good job of scheduling equipment and maintaining operating conditions by relying on controls integral to HVAC units, such as logic for compressor staging, to manage the equipment operating algorithms.

Even for smaller sites, inefficiencies arise when temperature sensors and thermostat schedules are not maintained, when there are separate systems for heating and cooling, and especially when equipment is added, or the facility is reconfigured or repurposed.

Based on our survey, it appears that the installation of an EMS at your site could increase the efficiency of your building HVAC system operation.

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

It is recommended that an HVAC engineer or contractor who specializes in EMSs be contacted for a detailed evaluation and implementation costs. For the purposes of this report, the potential energy savings and measure costs were estimated based on industry standards and previous project experience. Further analysis should be conducted for the feasibility of this measure. This is not an investment grade analysis nor should be used as a basis for design and construction.

A high-level evaluation of potential savings and costs is provided for demonstration purposes only. It is a screening evaluation for the potential in installing an EMS. Based on industry standards and previous project experience, the potential energy savings may be up to 20% of existing HVAC energy use. The average cost for installing and EMS may be between $2 and $4 per square foot. Actual savings and costs will need to be outlined by the specific contractor engaged to implement the system. For the purposes of this report, we have conservatively estimated savings to be 10% of the HVAC energy consumption baseline.

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 between 5 to 20 percent 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, planned capital upgrades, and 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 will 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 can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[5] . Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Weatherization

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

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

Lighting Maintenance

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

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

Lighting Controls

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

Motor Maintenance

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

Fans to Reduce Cooling Load

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

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.

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 AC or HP 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 check for fire dampers or balancing dampers that have failed closed.

Duct leakage in commercial buildings can account for 5% to 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 EMS 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

EMSs typically provide advanced controls for building HVAC systems, including chillers, boilers, air handling units, rooftop units and exhaust fans. The EMS 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 EMS features, when in proper adjustment, can improve comfort for building occupants and save substantial energy.

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

Water Heater Maintenance

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

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

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

Refrigeration Equipment Maintenance

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

Maintaining your commercial refrigeration equipment can save between 5 and 10 percent on energy costs. When condenser coils are dirty, your commercial refrigerators and freezers work harder to maintain the temperature inside. Worn gaskets, hinges, door handles or faulty seals cause cold air to leak from the unit, forcing the unit to run longer and use more electricity.

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

Water Conservation

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

For more information regarding water conservation go to the EPA's WaterSense® website[6] or download a copy of EPA's "WaterSense® at Work: Best Management

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

Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

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

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

Procurement Strategies

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

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

6 On-site Generation

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

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for your facility. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

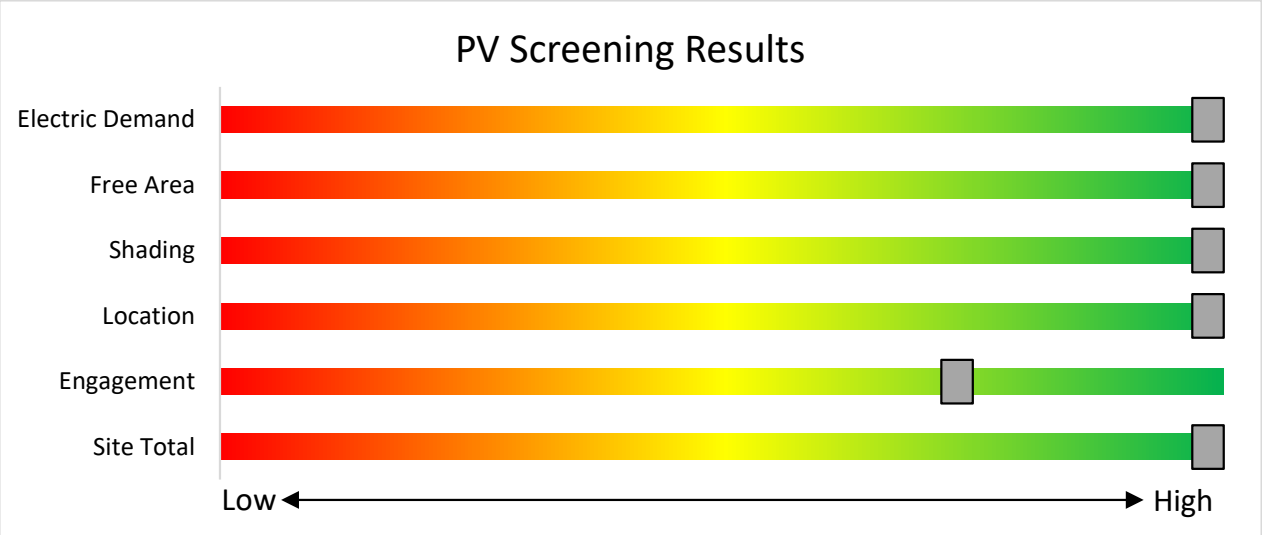
6.1 Solar Photovoltaic

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

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

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

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



Potential	High	
System Potential	215	kW DC STC
Electric Generation	256,145	kWh/yr
Displaced Cost	$31,150	/yr
Installed Cost	$559,000	

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.

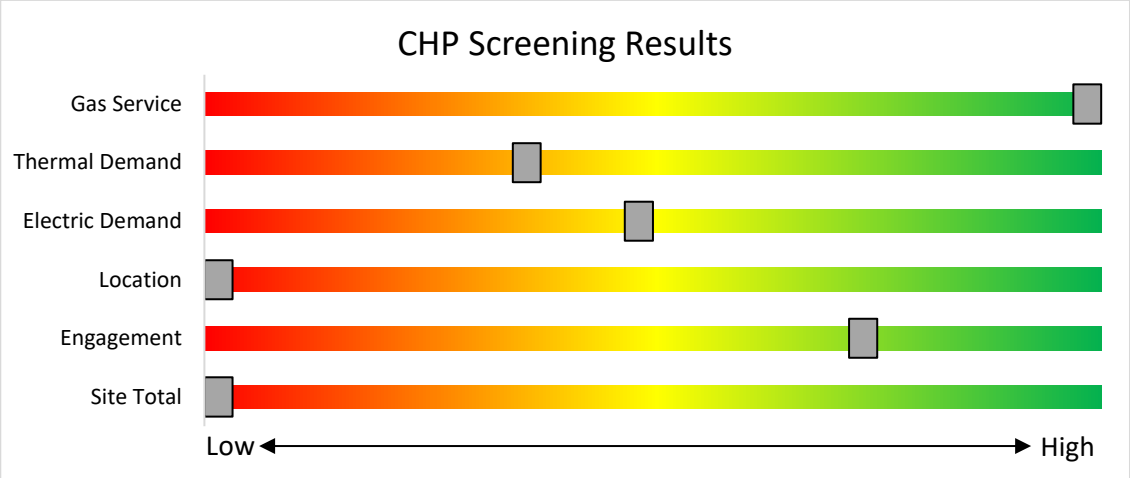


Figure 9 - Combined Heat and Power Screening

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 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? Your utility provider may be able to help.

7.1 Utility Energy Efficiency Programs

New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website.

8 New Jersey's Clean Energy Programs

New Jersey's Clean Energy Program will continue to offer some energy efficiency programs.

8.1 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.

8.2 Energy Savings Improvement Program

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

8.3 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 effective August 28, 2021.

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. The program is currently under development with the goal of holding the first solicitation by early-to-mid 2022. 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.

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. 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 includes the review of multiple bids for project work, incorporate potential operational & maintenance (O&M) cost savings and maximize your incentive potential.

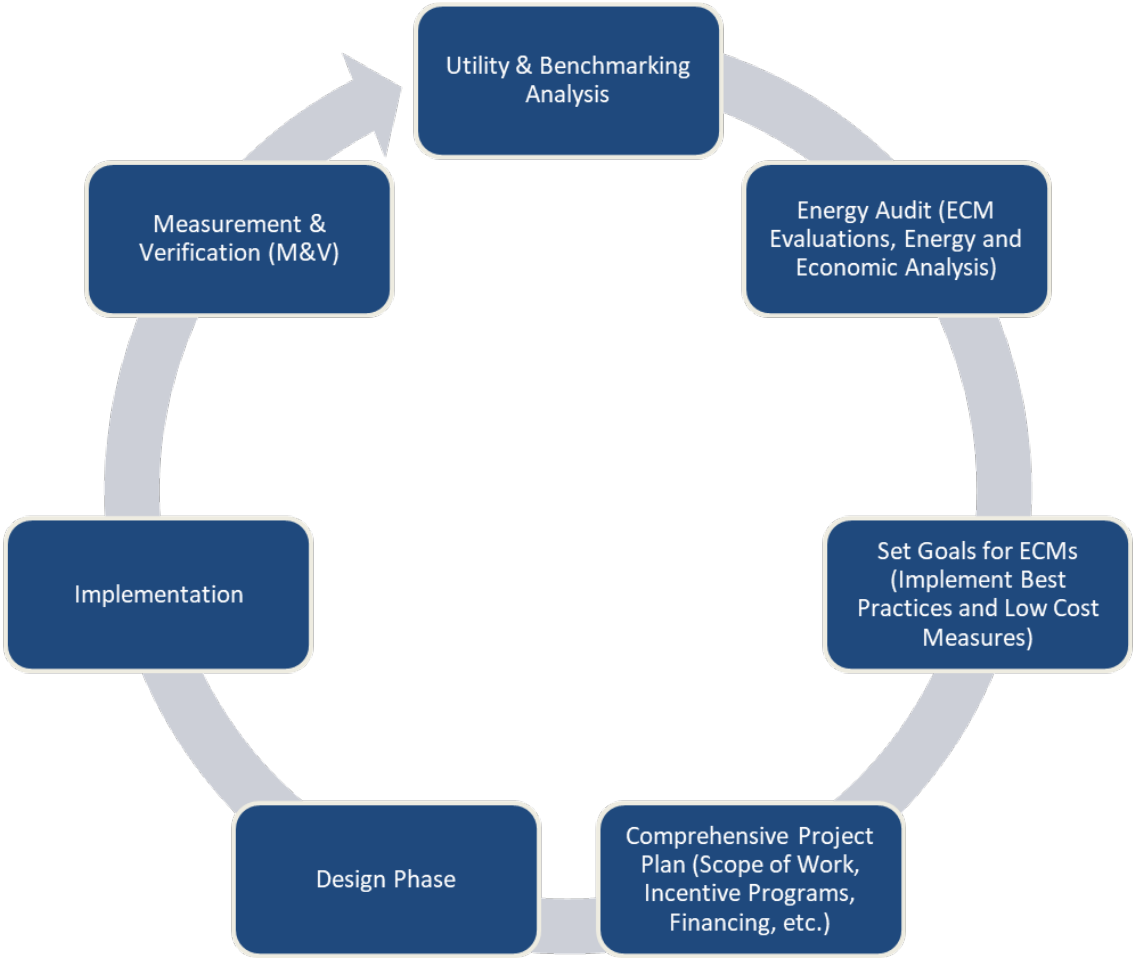


Figure 3 – Project Development Cycle

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. So, though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

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

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

10.2 Retail Natural Gas Supply Options

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

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

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

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

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

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Auditorium - MHS	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Auditorium - MHS	4	Incandescent: (12) 60W A19 Screw-In Lamps	Wall Switch	S	720	4,470	3, 4	Relamp	Yes	4	LED Lamps: A19 Lamps	Occupancy Sensor	108	3,084	1.9	12,695	-5	$1,467	$1,097	$83	0.7
Auditorium - MHS	5	Incandescent: (2) 60W A19 Screw-In Lamps	Wall Switch	S	120	4,470	3, 4	Relamp	Yes	5	LED Lamps: A19 Lamps	Occupancy Sensor	18	3,084	0.4	2,645	-1	$306	$442	$45	1.3
Auditorium - MHS	1	Incandescent: (34) 60W A19 Screw-In Lamps	Wall Switch	S	2,040	4,470	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	306	4,470	1.2	8,526	-4	$985	$586	$34	0.6
Auditorium - MHS	12	Incandescent: (5) 60W A19 Screw-In Lamps	Wall Switch	S	300	4,470	3, 4	Relamp	Yes	12	LED Lamps: A19 Lamps	Occupancy Sensor	45	3,084	2.3	15,869	-7	$1,833	$1,304	$95	0.7
Auto Shop - MHS	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	1.0	6,607	-3	$763	$1,978	$425	2.0
Classroom - Language Lab - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 102 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 103 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 104 - MHS	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,716	-2	$429	$1,197	$250	2.2
Classroom 106 - MHS	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.7	4,955	-2	$572	$1,416	$310	1.9
Classroom 107 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 108 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 109 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 110 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 111A - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 111B - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 112 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 113 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 114 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 115 - MHS	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	398	0	$46	$270	$35	5.1
Classroom 116 - MHS	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	398	0	$46	$270	$35	5.1
Classroom 117 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 119 - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,084	0.1	929	0	$107	$434	$80	3.3
Classroom G1 - MHS	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.8	5,456	-2	$630	$1,365	$335	1.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom G2 - MHS	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.8	5,456	-2	$630	$1,365	$335	1.6
Corridor - Ground - MHS	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - Ground - MHS	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.3	2,739	-1	$316	$852	$495	1.1
Corridor - Ground - MHS	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	5,390	3, 5	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,719	0.5	4,386	-2	$507	$1,180	$550	1.2
Corridor - Gym 1 - MHS	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 - Gym 1 - MHS	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	652	0	$75	$316	$200	1.5
Corridor - Gym 1 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.0	249	0	$29	$37	$10	0.9
Corridor - Gym 2 - MHS	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 - Gym 2 - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.0	391	0	$45	$280	$120	3.5
Corridor - Gym 2 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.1	498	0	$58	$298	$90	3.6
Corridor 1st Floor - MHS	15	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	15	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 1st Floor - MHS	2	LED Lamps: (12) 9W A19 Lamps	Wall Switch	S	108	5,390	5	None	Yes	2	LED Lamps: (12) 9W A19 Lamps	High/Low Control	108	3,719	0.0	397	0	$46	$225	$70	3.4
Corridor 1st Floor - MHS	1	LED Lamps: (16) 9W A19 Lamps	Wall Switch	S	144	5,390	5	None	Yes	1	LED Lamps: (16) 9W A19 Lamps	High/Low Control	144	3,719	0.0	265	0	$31	$0	$0	0.0
Corridor 1st Floor - MHS	1	LED Lamps: (6) 9W A19 Lamps	Wall Switch	S	54	5,390	5	None	Yes	1	LED Lamps: (6) 9W A19 Lamps	High/Low Control	54	3,719	0.0	99	0	$11	$0	$0	0.0
Corridor 1st Floor - MHS	29	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	29	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.5	3,782	-2	$437	$1,654	$1,160	1.1
Corridor 1st Floor - MHS	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	26	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.8	6,473	-3	$748	$2,074	$1,170	1.2
Corridor 1st Middle - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	9	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	1,174	0	$136	$614	$360	1.9
Corridor Basement MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.2	1,992	-1	$230	$742	$360	1.7
Electrical Room - Meters - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$40	15.1
Locker Room - Girls - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,084	0.0	216	0	$25	$153	$30	4.9
Locker Room - Girls - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Locker Room - Girls - MHS	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.3	2,183	-1	$252	$708	$155	2.2
Locker Room - Girls #2 - MHS	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
Locker Room - Girls #2 - MHS	2	Incandescent: (1) 100W A19 Screw-In Lamp	Wall Switch	S	100	4,470	3, 4	Relamp	Yes	2	LED Lamps: A19 Lamps	Occupancy Sensor	15	3,084	0.1	882	0	$102	$150	$22	1.3
Locker Room - Girls #2 - MHS	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,891	-1	$334	$781	$175	1.8

	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
Lounge - Auditorium - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Lounge - Custodians - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.2	1,455	-1	$168	$562	$115	2.7
Lounge - Teachers 1st Floor #1 - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,084	0.0	324	0	$37	$171	$35	3.6
Lounge - Teachers 1st Floor #2 - MHS	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	S	22	4,470	3	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	4,470	0.0	66	0	$8	$16	$3	1.7
Lounge - Teachers 1st Floor #2 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,084	0.0	216	0	$25	$153	$30	4.9
Lounge 1st Floor - MHS	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	S	33	4,470		None	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	4,470	0.0	0	0	$0	$0	$0	0.0
Lounge 1st Floor - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Lounge Guidance - MHS	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.0	177	0	$20	$270	$35	11.5
Main Gymnasium - MHS	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
Main Gymnasium - MHS	31	LED - Fixtures: High-Bay	Wall Switch	S	175	4,470	4	None	Yes	31	LED - Fixtures: High-Bay	Occupancy Sensor	175	3,084	1.2	8,269	-3	$955	$810	$105	0.7
Main Gymnasium - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,470	0.0	86	0	$10	$18	$5	1.3
Main Gymnasium - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,470	0.0	275	0	$32	$73	$20	1.7
Main Office - MHS	8	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,470	4	None	Yes	8	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	3,084	0.1	488	0	$56	$270	$35	4.2
Main Office - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Main Office - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,470	0.0	275	0	$32	$73	$20	1.7
Main Office #1 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Mechanical - Elevator - MHS	1	Incandescent: (1) 200W A19 Screw-In Lamp	Wall Switch	S	200	4,470	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	30	4,470	0.1	836	0	$97	$17	$1	0.2
Office - 1st Floor - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.2	1,455	-1	$168	$562	$115	2.7
Office - AD - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Office - AD #2 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Office - Assistant Principal - MHS	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,032	0	$119	$453	$85	3.1
Office - Attendance - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,084	0.0	216	0	$25	$153	$30	4.9
Office - Attendance - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Office - CST - MHS	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,239	-1	$143	$489	$95	2.8
Office - English - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,084	0.1	433	0	$50	$343	$20	6.5

	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
Office - Guidance - MHS	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
Office - Guidance - MHS	35	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	35	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,547	-1	$179	$810	$105	3.9
Office - Nurse - MHS	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.4	2,546	-1	$294	$781	$175	2.1
Office - Phys Ed Men - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Office - Phys Ed Men #2 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Office - Phys Ed Women - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.2	1,455	-1	$168	$562	$115	2.7
Office - SAO - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.2	1,091	0	$126	$489	$95	3.1
Office - Wood Shop - MHS	4	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	S	72	4,470	4	None	Yes	4	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	3,084	0.1	439	0	$51	$270	$35	4.6
Restroom - AD - MHS	1	Compact Fluorescent: (3) 26W Double Biaxial Plug-In Lamps	Wall Switch	S	78	4,470	3	Relamp	No	1	LED Lamps: GX23 (Plug-In) Lamps	Wall Switch	55	4,470	0.0	113	0	$13	$38	$3	2.6
Restroom - Assistant Principal - MHS	2	Incandescent: (1) 200W A19 Screw-In Lamp	Wall Switch	S	200	4,470	3, 4	Relamp	Yes	2	LED Lamps: A19 Lamps	Occupancy Sensor	30	3,084	0.3	1,763	-1	$204	$150	$22	0.6
Restroom - Coed 1st #1 - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,084	0.0	324	0	$37	$325	$15	8.3
Restroom - Coed 1st #2 - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,084	0.0	324	0	$37	$325	$15	8.3
Restroom - Custodian - MHS	1	Incandescent: (1) 40W A19 Screw-In Lamp	Wall Switch	S	40	4,470	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	6	4,470	0.0	167	0	$19	$17	$1	0.8
Restroom - Custodian - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,470	0.0	86	0	$10	$18	$5	1.3
Restroom - Female 1st - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Restroom - Female Ground - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Restroom - Female Gym - MHS	1	Incandescent: (1) 100W A19 Screw-In Lamp	Wall Switch	S	100	4,470	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	15	4,470	0.1	418	0	$48	$17	$1	0.3
Restroom - Female Gym - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Restroom - Female Phys Ed - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,470	0.0	162	0	$19	$37	$10	1.4
Restroom - Male 1st - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Restroom - Male Faculty Ground - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,084	0.0	216	0	$25	$153	$30	4.9
Restroom - Male Ground - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Restroom - Male Phys Ed - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,470	0.0	86	0	$10	$18	$5	1.3
Restroom - Nurse - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,470	0.0	275	0	$32	$73	$20	1.7
Stage - MHS	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

	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 - MHS	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	2,065	-1	$239	$635	$135	2.1
Stairs A - MHS	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	5,390	3, 5	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	652	0	$75	$316	$200	1.5
Stairs A - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.0	249	0	$29	$37	$10	0.9
Stairs B - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	5,390	3, 5	Relamp	Yes	9	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	1,174	0	$136	$614	$360	1.9
Stairs C - MHS	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	5,390	3, 5	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	652	0	$75	$316	$200	1.5
Stairs C - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.1	747	0	$86	$335	$135	2.3
Stairs D - MHS	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
Stairs D - MHS	2	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch		63	5,390	3, 5	Relamp	Yes	2	LED - Linear Tubes: (4) 2' Lamps	High/Low Control	34	3,719	0.1	469	0	$54	$355	$94	4.8
Stairs D - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	5,390	3, 5	Relamp	Yes	1	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.0	130	0	$15	$18	$5	0.9
Stairs G - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.3	2,241	-1	$259	$779	$405	1.4
Stairs H - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	5,390	3, 5	Relamp	Yes	9	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	1,174	0	$136	$614	$360	1.9
Stairs J - MHS	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	5,390	3, 5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	782	0	$90	$335	$240	1.0
Storage - Utility Gym #1 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$20	17.1
Storage - Utility Gym #2 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$20	17.1
Storage - Utility Gym #3 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$20	17.1
Storage - Utility Gym #4 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$20	17.1
Storage CST - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	924	0.0	34	0	$4	$37	$10	6.8
Storage Phys Ed Office - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$20	17.1
Utility Gym - MHS	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
Utility Gym - MHS	24	LED - Fixtures: High-Bay	Wall Switch	S	150	4,470	4	None	Yes	24	LED - Fixtures: High-Bay	Occupancy Sensor	150	3,084	0.8	5,487	-2	$634	$540	$70	0.7
Wood Shop - MHS	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.0	265	0	$31	$270	$35	7.7
Wood Shop - MHS	28	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	S	72	4,470	4	None	Yes	28	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	3,084	0.4	3,073	-1	$355	$540	$70	1.3
Wood Shop - MHS	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.7	4,542	-2	$525	$1,343	$290	2.0
Stairs E - MHS	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	5,390	3, 5	Relamp	Yes	7	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	913	0	$105	$578	$280	2.8
Stairs F - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	5,390	3, 5	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.0	391	0	$45	$280	$120	3.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restroom - Male 2nd - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Classroom 201 - MHS	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,716	-2	$429	$1,197	$250	2.2
Classroom 202 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 203 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 204 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 205 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 206 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 207 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 208 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 209 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 210 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 211 - MHS	17	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	751	0	$87	$540	$70	5.4
Classroom 213 - MHS	17	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	751	0	$87	$540	$70	5.4
Classroom 214 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 215 - MHS	17	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	751	0	$87	$540	$70	5.4
Classroom 217 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 218 - MHS	18	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,470	4	None	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	796	0	$92	$540	$70	5.1
Classroom 220 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 221 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom 222 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom Dance - MHS	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,303	-1	$382	$1,124	$230	2.3
Classroom DE2 - MHS	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	2,065	-1	$239	$635	$135	2.1
Conference 2nd Floor - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Corridor 2nd Floor - MHS	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 Floor - MHS	43	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	43	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.7	5,608	-2	$648	$2,585	$1,720	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 2nd Floor - MHS	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.5	4,481	-2	$518	$1,332	$810	1.0
Corridor 2nd Middle - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	9	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	1,174	0	$136	$614	$360	1.9
Electrical - Server Room 2nd Floor - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$40	15.1
Lounge - 2nd Floor - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Office - 2nd Floor Middle - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	619	0	$72	$380	$65	4.4
Office - 2nd Floor Middle #2 - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Office - Bridge North - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Office - Bridge South - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	619	0	$72	$380	$65	4.4
Office - Bridge South - MHS	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,084	0.1	386	0	$45	$261	$40	5.0
Office - Business - MHS	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,032	0	$119	$453	$85	3.1
Office - DE2 - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Office - ESL Office - MHS	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,032	0	$119	$453	$85	3.1
Restroom - 2nd Floor Lounge - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,470	0.0	162	0	$19	$37	$10	1.4
Restroom - Female 2nd - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Restroom - Female Dance - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,470	0.0	86	0	$10	$18	$5	1.3
Restroom - Male Dance - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,470	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,470	0.0	86	0	$10	$18	$5	1.3
Storage Physics - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	171	0	$20	$416	$40	19.1
Computer Lab 301 - MHS	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,716	-2	$429	$1,197	$250	2.2
Classroom 303 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 304 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 305 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 306 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 307 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 308 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 309 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 310 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 311 - MHS	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.7	4,955	-2	$572	$1,416	$310	1.9
Classroom 313 - MHS	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.7	4,955	-2	$572	$1,416	$310	1.9
Classroom 314 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 315 - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 317 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 318 - MHS	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	2,065	-1	$239	$635	$135	2.1
Classroom 319 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 320 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 321 - MHS	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom 322 - MHS	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,239	-1	$143	$489	$95	2.8
Classroom 323 - MHS	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	2,065	-1	$239	$635	$135	2.1
Classroom 324 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,652	-1	$191	$562	$115	2.3
Classroom ITV - MHS	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,716	-2	$429	$1,197	$250	2.2
Corridor 3rd Floor - MHS	10	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 3rd Floor - MHS	31	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	31	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.5	4,043	-2	$467	$1,916	$1,240	1.4
Corridor 3rd Floor - MHS	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.5	4,481	-2	$518	$1,332	$810	1.0
Corridor 3rd Middle - MHS	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	9	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.1	1,174	0	$136	$614	$360	1.9
Library - MHS	45	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	45	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	1.4	9,291	-4	$1,073	$2,453	$555	1.8
Lounge - 3rd Floor - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Office - 302 - MHS	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.6	4,336	-2	$501	$1,307	$280	2.0
Office - 316 - MHS	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,445	-1	$167	$526	$105	2.5
Office - 3rd Floor Middle - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	619	0	$72	$380	$65	4.4
Office - Social Worker - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Restroom - Female 3rd - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1

	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
Restroom - Male 3rd - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Storage Library - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	638	0.1	150	0	$17	$262	$40	12.8
Corridor Basement MHS	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
Corridor Basement MHS	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	S	22	5,390	3, 5	Relamp	Yes	1	LED - Linear Tubes: (1) 2' Lamp	High/Low Control	9	3,719	0.0	96	0	$11	$16	$3	1.2
Corridor Basement MHS	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	5,390	3, 5	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,719	0.2	1,304	-1	$151	$633	$400	1.5
Boiler Room - MHS	5	LED - Fixtures: High-Bay	Wall Switch	S	150	4,470		None	No	5	LED - Fixtures: High-Bay	Wall Switch	150	4,470	0.0	0	0	$0	$0	$0	0.0
Boiler Room - MHS	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,470	0.1	487	0	$56	$110	$30	1.4
Boiler Room - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,470	0.0	275	0	$32	$73	$20	1.7
Electrical - Generator Room - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	924	0.0	34	0	$4	$37	$10	6.8
Janitorial Basement - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	924	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	924	0.0	57	0	$7	$73	$20	8.1
Locker Room - Boys - MHS	8	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch	S	110	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	3,084	0.3	2,373	-1	$274	$978	$195	2.9
Locker Room - Weight Room #1 - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Locker Room - Weight Room #2 - MHS	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,445	-1	$167	$526	$105	2.5
Office - IT Department - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,470	0.0	162	0	$19	$37	$10	1.4
Office - IT Department - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.2	1,455	-1	$168	$562	$115	2.7
Office - IT Department #2 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,470	0.0	162	0	$19	$37	$10	1.4
Office - IT Department #2 - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.4	2,910	-1	$336	$854	$195	2.0
Office - Special Services - MHS	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,470	3, 4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Office - Special Services #1 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,470	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,470	0.0	243	0	$28	$55	$15	1.4
Office - Special Services #2 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,470	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,470	0.0	243	0	$28	$55	$15	1.4
Office - Special Services #3 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,470	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,470	0.0	243	0	$28	$55	$15	1.4
Office - Weight Room - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	413	0	$48	$189	$40	3.1
Restroom - Office WR - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,470	0.0	162	0	$19	$37	$10	1.4
Restroom - Weight Room - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	4,470	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	4,470	0.0	172	0	$20	$37	$10	1.3
Storage - Special Services - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	924	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	924	0.0	57	0	$7	$73	$20	8.1

	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
Storage - Tech - MHS	1	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	924	2, 4	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	638	0.1	110	0	$13	$129	$20	8.5
Storage - Tech - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$20	17.1
Storage - Weight Room #2 - MHS	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.3	469	0	$54	$672	$110	10.4
Storage Basement - MHS	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	638	0.1	150	0	$17	$262	$40	12.8
Storage Basement - Weight Room - MHS	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	171	0	$20	$416	$40	19.1
Storage Basement 1 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	924	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	924	0.0	57	0	$7	$73	$20	8.1
Storage Basement 2 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	924	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	924	0.0	57	0	$7	$73	$20	8.1
Storage Basement 3 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	924	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	924	0.0	57	0	$7	$73	$20	8.1
Storage Basement 4 - MHS	1	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	S	63	924	3, 4	Relamp	Yes	1	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	638	0.0	40	0	$5	$65	$12	11.4
Storage Basement 4 - MHS	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	924	3, 4	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	638	0.1	75	0	$9	$189	$20	19.5
Weight Room - MHS	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
Weight Room - MHS	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.6	4,129	-2	$477	$1,270	$270	2.1
Exterior - MHS	3	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Timeclock		42	4,380	3	Relamp	No	3	LED Lamps: PL-L (Biax) Lamps	Timeclock	30	4,380	0.0	158	0	$19	$41	$3	2.0
Exterior - MHS	2	Compact Fluorescent: (2) 42W Triple Biaxial Plug-In Lamps	Timeclock		84	4,380	3	Relamp	No	2	LED Lamps: PL-L (Biax) Lamps	Timeclock	59	4,380	0.0	219	0	$27	$54	$4	1.9
Exterior - MHS	4	Incandescent: (1) 100W A19 Screw-In Lamp	Timeclock		100	4,380	3	Relamp	No	4	LED Lamps: A19 Lamps	Timeclock	15	4,380	0.0	1,489	0	$181	$69	$4	0.4
Exterior - MHS	1	Metal Halide: (1) 200W Lamp	Timeclock		232	4,380	1	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	60	4,380	0.0	753	0	$92	$415	$50	4.0
Cafeteria - Annex A	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
Cafeteria - Annex A	30	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,470	4	None	Yes	30	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	3,084	0.3	1,829	-1	$211	$540	$70	2.2
Classroom AG1 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom AG2 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom AG3 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom AG4 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom AG5 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom AG6 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom AG7 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom AG8 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Corridor 1st - Annex A	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 1st - Annex A	19	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	19	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,719	0.5	4,419	-2	$511	$2,277	$855	2.8
Lounge Annex A - Annex A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Lounge Annex A - Annex A	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,084	0.1	386	0	$45	$261	$40	5.0
Restroom - Female 1st - Annex A	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	4,470		None	No	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	4,470	0.0	0	0	$0	$0	$0	0.0
Restroom - Lounge #1 - Annex A	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	4,470	0.0	143	0	$16	$72	$10	3.8
Restroom - Lounge #2 - Annex A	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	4,470	0.0	143	0	$16	$72	$10	3.8
Restroom - Male 1st - Annex A	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	4,470		None	No	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	4,470	0.0	0	0	$0	$0	$0	0.0
Stairs O - Annex A	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 O - Annex A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.1	747	0	$86	$335	$135	2.3
Stairs O - Annex A	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,719	0.1	698	0	$81	$442	$135	3.8
Storage - Cafeteria Annex A	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.2	213	0	$25	$453	$50	16.3
Classroom A20 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom A22 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom A23 - Annex A	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,891	-1	$334	$781	$175	1.8
Classroom A24 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom A25 - Annex A	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.4	2,478	-1	$286	$708	$155	1.9
Classroom A26 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom Band - Annex A	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom Band - Annex A	30	LED - Fixtures: Ceiling Mount	Wall Switch	S	20	4,470	4	None	Yes	30	LED - Fixtures: Ceiling Mount	Occupancy Sensor	20	3,084	0.1	915	0	$106	$540	$70	4.4
Classroom Band - Annex A	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,084	0.1	579	0	$67	$487	$65	6.3
Classroom Chorus - Annex A	24	LED - Fixtures: Ceiling Mount	Wall Switch	S	20	4,470	4	None	Yes	24	LED - Fixtures: Ceiling Mount	Occupancy Sensor	20	3,084	0.1	732	0	$85	$540	$70	5.6
Computer Lab A21 - Annex A	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.6	4,336	-2	$501	$1,307	$280	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 2nd - Annex A	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd - Annex A	25	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	25	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,719	0.7	5,815	-2	$672	$2,937	$1,125	2.7
Corridor Bridge - Annex A	8	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	8	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,719	0.2	1,861	-1	$215	$1,030	$360	3.1
Lounge A25 - Annex A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	619	0	$72	$380	$65	4.4
Office - Band - Annex A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Office - Copy Room Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,470	0.0	162	0	$19	$37	$10	1.4
Office - Copy Room Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,470	0.0	275	0	$32	$73	$20	1.7
Office - Copy Room #2 - Annex A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.1	826	0	$95	$416	$75	3.6
Office - Copy Room #3 - Annex A	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,032	0	$119	$453	$85	3.1
Restroom - Female 2nd - Annex A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	4,470	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,470	0.1	649	0	$75	$146	$40	1.4
Restroom - Male 2nd - Annex A	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	4,470	3	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	4,470	0.2	1,217	-1	$141	$274	$75	1.4
Storage Band 1 - Annex A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$20	17.1
Storage Band 2 - Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	924	0.0	34	0	$4	$37	$10	6.8
Storage Band 3 - Annex A	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	638	0.2	239	0	$28	$705	$60	23.3
Storage Band 4 - Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	924	0.0	34	0	$4	$37	$10	6.8
Storage Band 5 - Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	924	0.0	34	0	$4	$37	$10	6.8
Storage Band 6 - Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	924	0.0	34	0	$4	$37	$10	6.8
Storage Chorus 1 - Annex A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	85	0	$10	$189	$20	17.1
Storage Chorus 2 - Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	924	0.0	34	0	$4	$37	$10	6.8
Storage Chorus 3 - Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	924	0.0	34	0	$4	$37	$10	6.8
Classroom 30 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 31 - Annex A	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,716	-2	$429	$1,197	$250	2.2
Classroom 32 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 33 - Annex A	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,716	-2	$429	$1,197	$250	2.2
Classroom 34 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 35 - Annex A	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,716	-2	$429	$1,197	$250	2.2
Classroom 36 - Annex A	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.3	1,858	-1	$215	$599	$125	2.2
Classroom 37 - Annex A	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,716	-2	$429	$1,197	$250	2.2
Corridor 3rd - Annex A	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 3rd - Annex A	25	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	5,390	3, 5	Relamp	Yes	25	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,719	0.7	5,815	-2	$672	$2,937	$1,125	2.7
Office - 3rd Floor #1 - Annex A	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,032	0	$119	$453	$85	3.1
Office - 3rd Floor #2 - Annex A	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,032	0	$119	$453	$85	3.1
Office - 3rd Floor #3 - Annex A	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.2	1,239	-1	$143	$489	$95	2.8
Restroom - Female 3rd - Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,470	0.0	162	0	$19	$37	$10	1.4
Restroom - Female 3rd - Annex A	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	4,470	3	Relamp	No	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	4,470	0.1	570	0	$66	$290	$40	3.8
Restroom - Male 3rd - Annex A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,470	0.0	162	0	$19	$37	$10	1.4
Restroom - Male 3rd - Annex A	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	4,470	3	Relamp	No	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	4,470	0.1	570	0	$66	$290	$40	3.8
Storage 3rd Floor - Annex A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	128	0	$15	$380	$30	23.6
Storage 3rd Floor #2 - Annex A	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.2	341	0	$39	$562	$80	12.2
Corridor Basement Annex A	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 Basement Annex A	12	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	20	5,390	5	None	Yes	12	LED - Fixtures: Ambient 2x2 Fixture	High/Low Control	20	3,719	0.1	441	0	$51	$450	$420	0.6
Locker Room - Football - Annex A	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room - Football - Annex A	8	Incandescent: (1) 100W A19 Screw-In Lamp	Wall Switch	S	100	4,470	3, 4	Relamp	Yes	8	LED Lamps: A19 Lamps	Occupancy Sensor	15	3,084	0.5	3,526	-1	$407	$138	$8	0.3
Locker Room - Football - Annex A	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.6	3,923	-2	$453	$1,234	$260	2.1
Locker Room - Football - Annex A	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,084	0.1	386	0	$45	$261	$40	5.0
Mechanical - Hot Water Heaters - Annex A	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,470	0.2	1,298	-1	$150	$292	$80	1.4
Office - Athletic Trainer - Annex A	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.2	1,455	-1	$168	$562	$115	2.7
Office - Athletic Trainer - Annex A	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,084	0.1	386	0	$45	$261	$40	5.0
Office - Locker Room - Annex A	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,470	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,084	0.2	1,455	-1	$168	$562	$115	2.7
Restroom - LR Office - Annex A	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,470	3	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	4,470	0.0	143	0	$16	$72	$10	3.8

	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
Stairs L - Annex A	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
Stairs L - Annex A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.1	747	0	$86	$335	$135	2.3
Stairs L - Annex A	10	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	10	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,719	0.3	2,326	-1	$269	$1,175	$450	2.7
Stairs M - Annex A	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
Stairs M - Annex A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,719	0.1	747	0	$86	$335	$135	2.3
Stairs M - Annex A	10	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	5,390	3, 5	Relamp	Yes	10	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,719	0.3	2,326	-1	$269	$1,175	$450	2.7
Storage Basement - Annex A	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.2	256	0	$30	$489	$60	14.5
Storage Weight Room - Annex A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	924	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	638	0.1	171	0	$20	$416	$40	19.1
Weight Room - Annex A	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,470	3, 4	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,084	0.5	3,303	-1	$382	$1,124	$230	2.3

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical - Hot Water Heaters - Annex A	Sump Pump	2	Process Pump	5.0	87.5%	No	Baldor		W	730		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
Office - Athletic Trainer - Annex A	Hydrotherapy Tub	2	Other	1.0	82.5%	No	Whitehal		W	440		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof - Annex A	Annex A	1	Exhaust Fan	1.0	82.5%	No			W	2,745		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof - Annex A	Annex A	1	Exhaust Fan	1.5	84.0%	No			W	2,745		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - Annex A	Kitchen	1	Kitchen Hood Exhaust Fan	0.5	75.0%	No			W	2,400	9	No	78.2%	Yes	1	0.0	1,279	26	$535	$2,696	$50	4.9
Classrooms	Unit Ventilators	3	Supply Fan	0.8	78.0%	No	Bard		W	2,745		No	78.0%	No		0.0	0	0	$0	$0	$0	0.0
Classrooms	Unit Ventilators	3	Return Fan	0.5	75.0%	No	Bard		W	2,745		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - Annex A	Rooftop Unit 3	1	Supply Fan	10.0	89.5%	No	Energy Solutions		B	3,200	7	No	91.7%	Yes	1	3.0	10,434	0	$1,269	$5,152	$1,100	3.2
Roof - Annex A	Rooftop Unit 3	1	Return Fan	5.0	87.5%	No	Energy Solutions		B	3,200	7	No	89.5%	Yes	1	1.5	5,321	0	$647	$4,076	$900	4.9
Mechanical - Hot Water Heaters - Annex A	Annex A	1	Exhaust Fan	1.5	84.0%	No			W	2,745		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Hot Water Heaters - Annex A	Annex A	1	Exhaust Fan	0.5	75.0%	No			W	2,745		No	75.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - MHS	Computer Lab 301 - MHS	1	Supply Fan	0.8	78.0%	No	Trane		W	8,760		No	78.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof - Annex A	Rooftop Unit 1	1	Supply Fan	20.0	91.0%	No	Energy Solutions		B	3,200	7	No	93.0%	Yes	1	5.9	20,436	0	$2,485	$8,582	$1,300	2.9
Roof - Annex A	Rooftop Unit 1	1	Return Fan	10.0	89.5%	No	Energy Solutions		B	3,200	7	No	91.7%	Yes	1	3.1	10,434	0	$1,269	$5,152	$1,100	3.2

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 - MHS	IDF Rooms	1	Split-System	4.00		13.00		Thermal Zone	TZAA-348-2A757	W		No							0.0	0	0	$0	$0	$0	0.0
Boiler Room - MHS	Boiler Room - MHS	1	Ductless Mini-Split AC	0.75		10.00		Sanyo	CL0951	B	10	Yes	1	Ductless Mini-Split AC	0.75		18.00		0.2	200	0	$24	$5,327	$0	219.0
Exterior - MHS	Office - Attendence - MHS	1	Ductless Mini-Split AC	2.00		12.50		Mitsubishi	MSY-GE24NA	W		No							0.0	0	0	$0	$0	$0	0.0
Conference 2nd Floor - MHS	Conference 2nd Floor - MHS	1	Ductless Mini-Split AC	2.00		12.00		Samsung		W		No							0.0	0	0	$0	$0	$0	0.0
Exterior - MHS	Office - IT Department - MHS	1	Ductless Mini-Split HP	1.50	20.00	14.20	9.8 HSPF	Mitsubishi	PKFY-P18NLMU-E	N		No							0.0	0	0	$0	$0	$0	0.0
Exterior - MHS	Office - IT Department #2 - MHS	1	Ductless Mini-Split HP	2.50	32.00	13.60	8.7 HSPF	Mitsubishi	PKA-A30KA4	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior - MHS	Office - Special Services - MHS	1	Ductless Mini-Split AC	2.62		12.50		Mitsubishi	MSY-GL24NA	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior - MHS	Storage - Basement - MHS	1	Ductless Mini-Split AC	2.00		12.00		Sanyo		W		No							0.0	0	0	$0	$0	$0	0.0
Roof - MHS	Computer Lab 301 - MHS	1	Package Unit	5.00		12.00		Trane	TWE060A300EL	B	10	Yes	1	Package Unit	5.00		16.00		0.6	625	0	$76	$8,205	$515	101.2
Roof - MHS	Computer Lab 301 - MHS	1	Split-System	5.00		12.00		Trane	2TTA2060A3000AA	B	10	Yes	1	Split-System	5.00		16.00		0.6	625	0	$76	$6,521	$525	78.9
Electrical - Server Room 2nd Floor - MHS	Electrical - Server Room 2nd Floor - MHS	1	Split-System	4.00		10.00		York	F2FP048H06B	B	10	Yes	1	Split-System	4.00		16.00		0.9	900	0	$109	$6,486	$420	55.4
Classroom - Language Lab - MHS	Classroom - Language Lab - MHS	1	Window AC	1.25		10.80		Frigidaire		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom - Language Lab - MHS	Classroom - Language Lab - MHS	1	Window AC	1.25		10.80		LG	LW1511ER	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 106 - MHS	Classroom 106 - MHS	1	Window AC	2.08		9.40		Gibson	GAS256Q2A1	W		No							0.0	0	0	$0	$0	$0	0.0
Lounge - Custodians - MHS	Lounge - Custodians - MHS	1	Window AC	0.83		10.00				W		No							0.0	0	0	$0	$0	$0	0.0
Lounge Guidance - MHS	Lounge Guidance - MHS	1	Window AC	1.26		11.20		Frigidaire	FFRE1533Q1	W		No							0.0	0	0	$0	$0	$0	0.0
Main Office - MHS	Main Office - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Office - AD - MHS	Office - AD - MHS	1	Window AC	1.25		10.80		LG	LW1511ER	W		No							0.0	0	0	$0	$0	$0	0.0
Office - AD #2 - MHS	Office - AD #2 - MHS	1	Window AC	0.67		9.80		GE	Quiet Aire	B	10	Yes	1	Window AC	0.67		12.00		0.1	75	0	$9	$582	$0	64.0
Office - Assistant Principal - MHS	Office - Assistant Principal - MHS	1	Window AC	1.19		11.90		GE		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
Office - Guidance - MHS	Office - Guidance - MHS	1	Window AC	1.25		10.80		Frigidaire		W		No							0.0	0	0	$0	$0	$0	0.0
Office - Guidance - MHS	Office - Guidance - MHS	1	Window AC	1.25		10.80		Frigidaire		W		No							0.0	0	0	$0	$0	$0	0.0
Office - Guidance - MHS	Office - Guidance - MHS	1	Window AC	0.67		9.80		GE	Quiet Aire	B	10	Yes	1	Window AC	0.67		12.00		0.1	75	0	$9	$582	$0	64.0
Office - Guidance - MHS	Office - Guidance - MHS	1	Window AC	1.25		10.00		Sanyo		B	10	Yes	1	Window AC	1.25		12.00		0.1	125	0	$15	$794	$0	52.2
Office - Guidance - MHS	Office - Guidance - MHS	1	Window AC	0.67		9.80				W		No							0.0	0	0	$0	$0	$0	0.0
Office - Guidance - MHS	Office - Guidance - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Office - Guidance - MHS	Office - Guidance - MHS	1	Window AC	0.67		9.80		GE	Quiet Aire	B	10	Yes	1	Window AC	0.67		12.00		0.1	75	0	$9	$582	$0	64.0
Office - Nurse - MHS	Office - Nurse - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Office - Phys Ed Women - MHS	Office - Phys Ed Women - MHS	1	Window AC	1.26		11.20		Frigidaire	FFRE1533Q1	W		No							0.0	0	0	$0	$0	$0	0.0
Office - SAO - MHS	Office - SAO - MHS	1	Window AC	0.67		9.80		GE	Quiet Aire	B	10	Yes	1	Window AC	0.67		12.00		0.1	75	0	$9	$582	$0	64.0
Classroom Dance - MHS	Classroom Dance - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom DE2 - MHS	Classroom DE2 - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Electrical - Server Room 2nd Floor - MHS	Electrical - Server Room 2nd Floor - MHS	1	Window AC	2.08		9.80		Frigidaire	FFRE2533Q2	W		No							0.0	0	0	$0	$0	$0	0.0
Lounge - 2nd Floor - MHS	Lounge - 2nd Floor - MHS	1	Window AC	1.26		11.20		Frigidaire	FFRE1533Q1	W		No							0.0	0	0	$0	$0	$0	0.0
Office - 2nd Floor Middle - MHS	Office - 2nd Floor Middle - MHS	1	Window AC	0.83		10.00				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 2nd Floor Middle #2 - MHS	Office - 2nd Floor Middle #2 - MHS	1	Window AC	0.83		10.00		GE	Quiet Aire	B	10	Yes	1	Window AC	0.83		12.00		0.1	83	0	$10	$643	$0	63.4
Office - Bridge North - MHS	Office - Bridge North - MHS	1	Window AC	0.67		9.80		LG	LWHD8000RY6	W		No							0.0	0	0	$0	$0	$0	0.0
Office - Bridge North - MHS	Office - Bridge North - MHS	1	Window AC	1.25		10.80		Frigidaire		W		No							0.0	0	0	$0	$0	$0	0.0
Office - Business - MHS	Office - Business - MHS	1	Window AC	1.26		11.20		Frigidaire	FFRE1533Q1	W		No							0.0	0	0	$0	$0	$0	0.0
Storage Physics - MHS	Storage Physics - MHS	1	Window AC	1.26		11.20		Frigidaire	FFRE1533Q1	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 308 - MHS	Classroom 308 - MHS	1	Window AC	0.83		10.00				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 311 - MHS	Classroom 311 - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 313 - MHS	Classroom 313 - MHS	2	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 314 - MHS	Classroom 314 - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 315 - MHS	Classroom 315 - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 317 - MHS	Classroom 317 - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Library - MHS	Library - MHS	3	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Lounge - 3rd Floor - MHS	Lounge - 3rd Floor - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 302 - MHS	Office - 302 - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 316 - MHS	Office - 316 - MHS	1	Window AC	1.25		10.80				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 3rd Floor Middle - MHS	Office - 3rd Floor Middle - MHS	1	Window AC	0.83		10.00				W		No							0.0	0	0	$0	$0	$0	0.0
Office - Social Worker - MHS	Office - Social Worker - MHS	1	Window AC	0.83		10.00				W		No							0.0	0	0	$0	$0	$0	0.0
Storage Library - MHS	Storage Library - MHS	1	Window AC	0.83		10.00				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 213 - MHS	Classroom 213 - MHS	1	Unit Ventilator	4.50	54.00	11.20	3.6 COP	Bard	I60H1DB18RP	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 215 - MHS	Classroom 215 - MHS	1	Unit Ventilator	4.50	54.00	11.20	3.6 COP	Bard	I60H1DB18RP	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 218 - MHS	Classroom 218 - MHS	1	Unit Ventilator	4.50	54.00	11.20	3.6 COP	Bard	I60H1DB18RP	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior - Annex A	Music Rooms	2	Ductless Mini-Split HP	4.00	54.00	18.90	11.4 HSPF	Mitsubishi	MXZ-8C48NA	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior - Annex A	Cafeteria - Annex A	1	Ductless Mini-Split HP	2.33	28.40	18.00	9 HSPF	Johnson Controls	DHP30CSB21S	N		No							0.0	0	0	$0	$0	$0	0.0
Classroom AG1 - Annex A	Classroom AG1 - Annex A	2	Window AC	1.25		10.80		LG		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom AG3 - Annex A	Classroom AG3 - Annex A	2	Window AC	1.25		10.80				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 AG5 - Annex A	Classroom AG5 - Annex A	2	Window AC	1.25		10.80		LG		W		No							0.0	0	0	$0	$0	$0	0.0
Classroom AG7 - Annex A	Classroom AG7 - Annex A	1	Window AC	1.25		10.80		LG		W		No							0.0	0	0	$0	$0	$0	0.0
Computer Lab A21 - Annex A	Computer Lab A21 - Annex A	1	Window AC	0.67		10.90		Frigidaire	FFRS0822S1	W		No							0.0	0	0	$0	$0	$0	0.0
Computer Lab A21 - Annex A	Computer Lab A21 - Annex A	1	Window AC	1.00		9.50		Frigidaire	FAK123J1V4	B	10	Yes	1	Window AC	1.00		12.00		0.1	132	0	$16	$703	$0	43.9
Classroom 31 - Annex A	Classroom 31 - Annex A	2	Window AC	0.67		10.90				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 32 - Annex A	Classroom 32 - Annex A	2	Window AC	0.67		10.90				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 37 - Annex A	Classroom 37 - Annex A	2	Window AC	0.67		10.90				W		No							0.0	0	0	$0	$0	$0	0.0
Office - 3rd Floor #3 - Annex A	Office - 3rd Floor #3 - Annex A	1	Window AC	0.83		9.50		Maytag	M6V1082A	W	10	Yes	1	Window AC	0.83		12.00		0.1	110	0	$13	$643	$0	48.2
Classroom A20 - Annex A	Classroom A20 - Annex A	2	Window AC	0.67		10.90		Frigidaire	FFRS0822S1	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom A22 - Annex A	Classroom A22 - Annex A	1	Window AC	0.67		10.90				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom A23 - Annex A	Classroom A23 - Annex A	2	Window AC	0.67		10.90				W		No							0.0	0	0	$0	$0	$0	0.0
Classroom A25 - Annex A	Classroom A25 - Annex A	2	Window AC	0.67		10.90				W		No							0.0	0	0	$0	$0	$0	0.0
Roof - Annex A	Rooftop Unit 1	1	Package Unit		453.80		1 COP	Energy Systems	TR-8	B		No							0.0	0	0	$0	$0	$0	0.0
Roof - Annex A	Rooftop Unit 3	1	Package Unit		235.43		1 COP	Energy Systems	TR-8	B		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
Boiler Room - HS	Memorial High School	1	Non-Condensing Hot Water Boiler	4,090	Weil McLain	1688	B	11	Yes	1	Non-Condensing Hot Water Boiler	4,090	85.00%	Ec	0.0	0	170	$2,475	$70,083	$0	28.3
Boiler Room - HS	Memorial High School	1	Forced Draft Steam Boiler	4,650	Weil McLain	1794	B	12	Yes	1	Forced Draft Steam Boiler	4,650	81.00%	Et	0.0	0	41	$591	$79,679	$0	134.9

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
Boiler Room - MHS	Domestic Hot Water	13	4	1.50	0.0	621	0	$76	$29	$8	0.3

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
Boiler Room - MHS	Domestic Hot Water	2	Boiler	Laars	MT2V075	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical - Hot Water Heaters - Annex A	Domestic Hot Water	2	Storage Tank Water Heater (> 50 Gal)	AO Smith	DVE-120A 100	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
Memorial High School	14	56	Faucet Aerator (Lavatory)	2.20	0.50	0.0	7,785	0	$947	$402	$224	0.2
Annex A	14	56	Faucet Aerator (Lavatory)	2.20	0.50	0.0	7,785	0	$947	$402	$224	0.2

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 - Annex A	1	Cooler (35F to 55F)	Trenton Refrigeration	TPLP106MAS1BR6	15, 16	Yes	No	Yes	0.0	669	0	$81	$1,977	$115	22.9
Storage - Cafeteria - Annex A	1	Cooler (35F to 55F)	Russell	RL6A066ADASL		No	No	No	0.0	0	0	$0	$0	$0	0.0
Storage - Cafeteria - Annex A	1	Medium Temp Freezer (0F to 30F)	Russell	RL6E077DDASL		No	No	No	0.0	0	0	$0	$0	$0	0.0

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
Kitchen - Annex A	1	Freezer Chest			No		No	0.0	0	0	$0	$0	$0	0.0
Cafeteria - Annex A	1	Refrigerator Chest	Powers	780	No		No	0.0	0	0	$0	$0	$0	0.0
Cafeteria - Annex A	2	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	True	GDM-37	No		No	0.0	0	0	$0	$0	$0	0.0
Cafeteria - Annex A	1	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)	Cornelius	VR-26	No		No	0.0	0	0	$0	$0	$0	0.0
Cafeteria - Annex A	1	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	Beverage Air	CDR3-1	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - Annex A	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Turbo Air	TSR-49SD	Yes		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
Office - Athletic Trainer - Annex A	1	Ice Making Head (≥450 lbs/day), Batch	Scotsman	F0522A-1E	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
Kitchen - Annex A	1	Electric Convection Oven (Full Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Cafeteria - Annex A	1	Electric Convection Oven (Half Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Cafeteria - Annex A	1	Electric Fryer			No		No	0.0	0	0	$0	$0	$0	0.0
Cafeteria - Annex A	1	Electric Griddle (≤2 Feet Width)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - Annex A	1	Electric Griddle (3 Feet Width)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - Annex A	1	Insulated Food Holding Cabinet (Full Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen - Annex A	1	Electric Griddle (3 Feet Width)			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
Memorial High School	20	Coffee Machine	500	No		
Memorial High School	240	Desktop	120	No		
Memorial High School	4	Fan (Large)	200	No		
Memorial High School	21	Microwave	1,000	No		
Memorial High School	24	Shop Equipment	500	No		
Memorial High School	1	Treadmill	2,000	No		
Memorial High School	8	Paper Shredder	146	No		
Memorial High School	60	Printer (Medium/Small)	450	No		
Memorial High School	10	Printer/Copier (Large)	600	No		
Memorial High School	22	Refrigerator (Mini)	175	No		
Memorial High School	5	Refrigerator (Residential)	340	No		
Memorial High School	64	Smart Board	215	Yes		
Memorial High School	7	Television	224	No		
Memorial High School	3	Toaster Oven	600	No		
Memorial High School	6	Water Cooler	192	No		
Memorial High School	8	Water Fountain	370	No		
Memorial High School	1	Server	2,000	No		
Annex A	3	Clothes Dryer	1,800	No		
Annex A	3	Clothes Washer	1,200	No		
Annex A	11	Coffee Machine	500	No		
Annex A	42	Desktop	120	No		
Annex A	2	Fan (Large)	200	No		
Annex A	5	Kiln	11,000	No		
Annex A	9	Laptop	50	No		
Annex A	15	Microwave	1,000	No		
Annex A	3	Residential Oven	1,200	No		
Annex A	1	Deli Slicer	345	No		
Annex A	16	Printer (Medium/Small)	450	No		
Annex A	1	Printer/Copier (Large)	600	No		
Annex A	6	Refrigerator (Mini)	175	No		
Annex A	3	Refrigerator (Residential)	340	No		
Annex A	5	Serving Table (Chilled/Heated)	3,400	No		
Annex A	24	Smart Board	215	Yes		
Annex A	2	Television	224	No		
Annex A	1	Toaster	600	No		

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
Annex A	1	Water Cooler	192	No		
Annex A	11	Water Fountain	370	No		
Annex A	1	Server	2,000	No		

Custom (High Level) Measure Analysis

Installation of an Energy Management System

Building Square Footage	70,000		Fuel Utility Rate	$14.565	MMBtu
Percent of Conditioned Area Impacted	100%		Blended Electric Utility Rate	$0.122	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
Limited/No HVAC Controls	HVAC Equipment & Systems	15	203,063	253,433	6,173	Installation of an Energy Management System	10%	10%	10%	$3.00	0.00	45,650	617	$14,542	$210,000	$0	$0	$0	$210,000	14.44	14.44

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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

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ENERGY STAR® Statement of Energy Performance

88

ENERGY STAR® Score[1]

Memorial High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 274,799
Built: 1926

For Year Ending: December 31, 2019
Date Generated: October 18, 2021

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
Memorial High School 5501 Park Avenue West New York, New Jersey 07093	West New York Board of Education 6028 Broadway West New York, NJ 07093 (201) 553-4000	Dean Austin 6028 Broadway West New York, NJ 07093 (201) 553-4000 x 30063 daustin@wnyschools.net

Property ID: 15545793

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
40.3 kBtu/ft²

Source EUI
71.3 kBtu/ft²

Annual Energy by Fuel

Electric - Solar (kBtu)	183,509 (2%)
Fuel Oil (No. 2) (kBtu)	6,165,771 (56%)
Natural Gas (kBtu)	26,996 (0%)
Electric - Grid (kBtu)	4,701,706 (42%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	67
National Median Source EUI (kBtu/ft²)	118.6
% Diff from National Median Source EUI	-40%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	913

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	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
TREC	*Transition Incentive Renewable Energy Certificate:* a factorized renewable energy certificate you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense®	The symbol for water efficiency. The WaterSense® program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.