Local Government Energy Audit Report

High Mountain School

January 26, 2023

Prepared for:
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Disclaimer

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

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

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

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

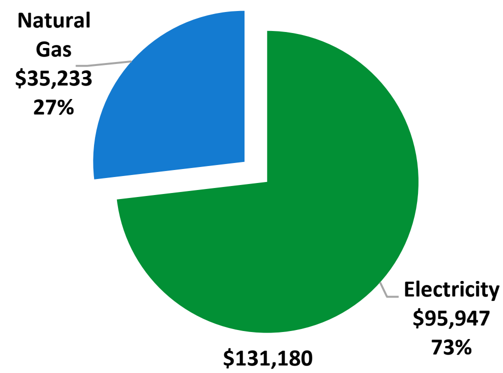
The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state, and federal requirements.

Table of Contents

1 Executive Summary

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

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $131,180 Electricity: 744,250 kWh Natural Gas: 34,106 Therms	
ENERGY STAR® Benchmarking Score	10 *(1-100 scale)*	This building performs at below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

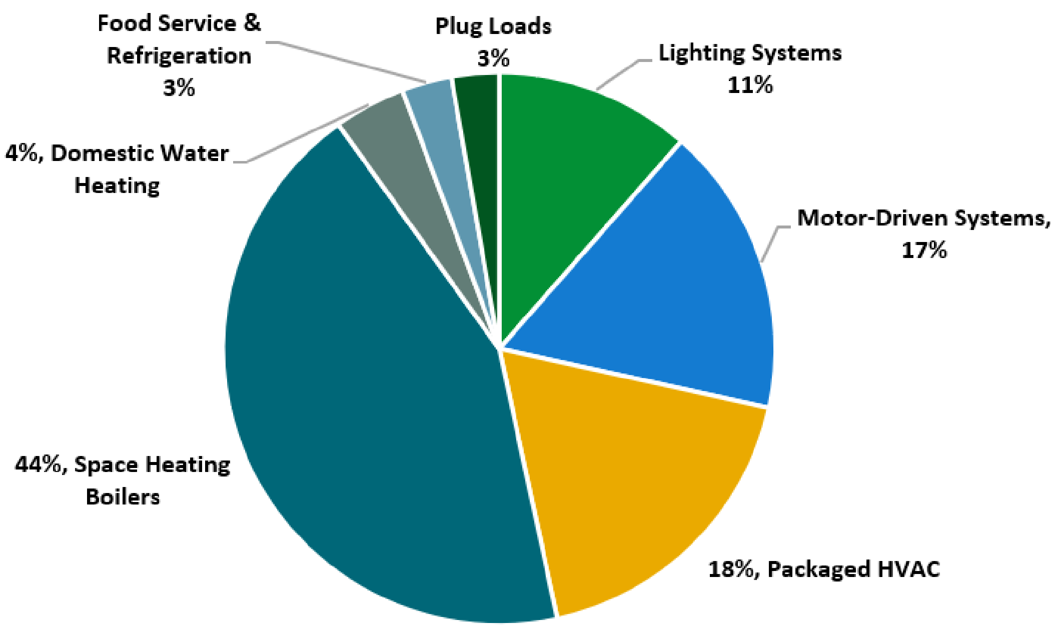


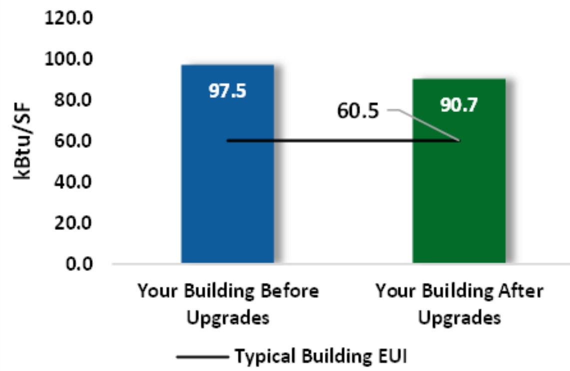
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

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

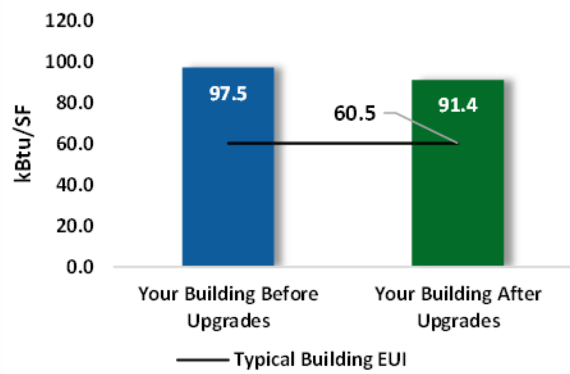
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$176,188
Potential Rebates & Incentives[1]	$12,923
Annual Cost Savings	$13,892
Annual Energy Savings	Electricity: 102,402 kWh Natural Gas: 669 Therms
Greenhouse Gas Emission Savings	55 Tons
Simple Payback	11.8 Years
Site Energy Savings (All Utilities)	7%



Scenario 2: Cost Effective Package[2]

Installation Cost	$80,149
Potential Rebates & Incentives	$9,080
Annual Cost Savings	$12,347
Annual Energy Savings	Electricity: 90,906 kWh Natural Gas: 607 Therms
Greenhouse Gas Emission Savings	49 Tons
Simple Payback	5.8 Years
Site Energy Savings (all utilities)	6%



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			**347**	**0.1**	**0**	**$44**	**$217**	**$30**	**$187**	**4.3**	**341**
ECM 1	Retrofit Fixtures with LED Lamps	Yes	347	0.1	0	$44	$217	$30	$187	4.3	341
Lighting Control Measures			**12,075**	**2.2**	**-3**	**$1,531**	**$8,526**	**$4,560**	**$3,966**	**2.6**	**11,864**
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	6,699	1.3	-1	$849	$3,126	$395	$2,731	3.2	6,582
ECM 3	Install High/Low Lighting Controls	Yes	5,376	1.0	-1	$681	$5,400	$4,165	$1,235	1.8	5,282
Variable Frequency Drive (VFD) Measures			**58,850**	**9.5**	**0**	**$7,587**	**$64,028**	**$4,325**	**$59,703**	**7.9**	**59,261**
ECM 4	Install VFDs on Constant Volume (CV) Fans	Yes	40,933	6.6	0	$5,277	$45,673	$1,925	$43,748	8.3	41,219
ECM 5	Install VFDs on Heating Water Pumps	Yes	17,917	3.0	0	$2,310	$18,354	$2,400	$15,954	6.9	18,042
Unitary HVAC Measures			**11,496**	**5.7**	**6**	**$1,546**	**$96,040**	**$3,843**	**$92,197**	**59.7**	**12,296**
ECM 6	Install High Efficiency Air Conditioning Units	No	11,496	5.7	6	$1,546	$96,040	$3,843	$92,197	59.7	12,296
Food Service & Refrigeration Measures			**1,716**	**0.0**	**0**	**$221**	**$2,496**	**$165**	**$2,331**	**10.5**	**1,728**
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	258	0.0	0	$33	$303	$40	$263	7.9	260
ECM 8	Refrigeration Controls	Yes	1,458	0.0	0	$188	$2,193	$125	$2,068	11.0	1,468
Custom Measures			**17,918**	**0.0**	**63**	**$2,964**	**$4,882**	**$0**	**$4,882**	**1.6**	**25,459**
ECM 9	Optimize HVAC Schedule	Yes	17,918	0.0	63	$2,964	$4,882	$0	$4,882	1.6	25,459
TOTALS (COST EFFECTIVE MEASURES)			**90,906**	**11.9**	**61**	**$12,347**	**$80,149**	**$9,080**	**$71,069**	**5.8**	**98,654**
TOTALS (ALL MEASURES)			**102,402**	**17.6**	**67**	**$13,892**	**$176,188**	**$12,923**	**$163,266**	**11.8**	**110,950**

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

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

Figure 2 – Evaluated Energy Improvements

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

1.1 Planning Your Project

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

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

Pick Your Installation Approach

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

Options from Your Utility Company

Prescriptive and Custom Rebates

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the Prescriptive and Custom Rebates program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval may be required for some incentives. Contact your utility company for more details prior to project installation.

Direct Install

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

Engineered Solutions

The Engineered Solutions program provides tailored energy-efficiency assistance and turnkey engineering services to municipalities, universities, schools, hospitals, and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. The program provides all professional services from audit, design, construction administration, to commissioning and measurement and verification for custom whole-building energy-efficiency projects. Engineered Solutions allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs.

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

Options from New Jersey's Clean Energy Program

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

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

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

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

Successor Solar Incentive Program (SuSI)

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

Ongoing Electric Savings with Demand Response

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

Large Energy User Program (LEUP)

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

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

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for High Mountain School. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs.

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

2.1 Site Overview

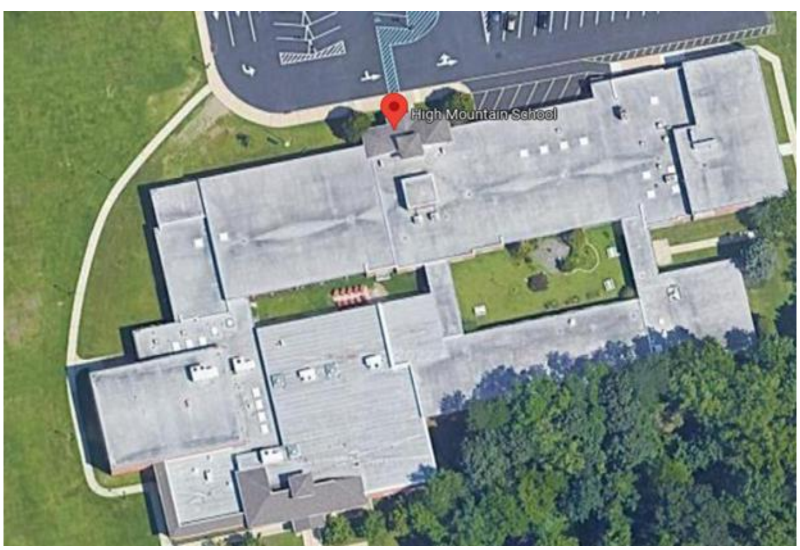
TRC performed an energy audit at High Mountain School located in North Haledon, New Jersey. TRC met with Toska Musteba to review the facility operations and help focus our investigation on specific energy-using systems.

High Mountain School is located at 515 High Mountain Rd in North Haledon, Passaic County. It is a public middle school that serves students in the 5th to 8th grades. The facility is a one-story 61,025 square foot school building that includes typical educational, administrative, assembly, and recreational spaces. The original building was built in 1962 and was expanded in 2007 to accommodate additional activities. Spaces include classrooms, administrative offices, media center, gymnasium, kitchen, cafeteria, restrooms, corridors, and storage and mechanical rooms.

Facility lighting consists of LED tubes and fixtures. The building is 100% heated by a combination of four condensing boilers and roof top package units (RTUs). The building is mainly cooled by air handling units (AHUs) equipped with direct expansion (DX) coils. However, classrooms are heated and cooled by 21 Airedale fan coil units equipped with (DX) coils and hot water coils.

Over the last four years, the facility has replaced all interior and exterior lighting systems with LED tubes and LED fixtures.

The facility is interested in replacing the old AAON condensing and packaged units.



Aerial View - High Mountain School

2.2 Building Occupancy

The school operates on a 10-month schedule, from September to June. The gymnasium is used on Saturdays from November to March for sports and other events. The entire facility is shut down around 11:00 PM after the cleaning process.

During a typical day, the facility is occupied by approximately 300 students and 50 staff. It should be noted that the energy and economic analysis for this building is based on the use of the building during the utility billing period, and that results will vary based on changes to building use patterns.

Building Name	Weekday/Weekend	Operating Schedule
High Mountain School - General Operating Hours	Weekday	6:30 AM - 11:00 PM
	Saturday	Varies
High Mountain School - Classes Hours	Weekday	8:30:00 AM - 2:50 PM
	Weekend	Closed

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are made of concrete masonry units (CMUs) over structural steel with a brick veneer façade, with gypsum drywall painted CMU interior finish. The building flat roof sections are supported with steel trusses and reinforced concrete deck and finished with grey membrane and gravel. The gravel roof section in poor condition and needs replacement while the grey membrane roof is in good condition. The flat roof sections house the condensing units, RTUs, and exhaust fans. There is a pitched section finished with asphalt shingles that are in good condition.

Windows throughout the facility are double-paned glass with aluminum frames. The glass-to-frame seals are in fair condition. The fixed window weather seals are also in fair condition, showing little evidence of wear. The main entrance doors are glass with aluminum frames. Exit doors are constructed of metal with incorporated glass. Overall, the building envelope is in fair condition.

Building Walls



Roofs

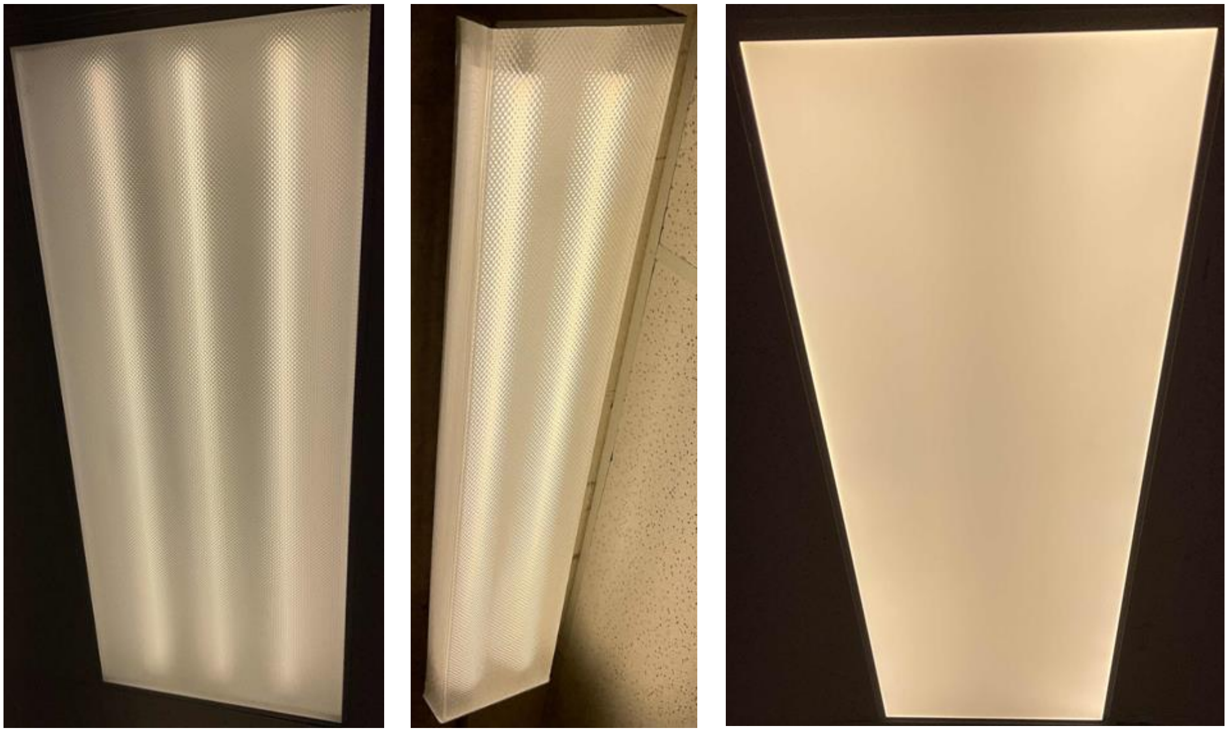

Window & Exit Doors

2.4 Lighting Systems

The interior lighting system uses a combination of LED tubes, lamps, and fixtures. LED linear tubes include 1- 2- 3 and 4-lamp, 4-foot-long troffer, recessed, and surfaced mounted fixtures. The corridors are lit with a combination of LED tubes and panels. Stairs are lit with LED panels while the gymnasium is illuminated with LED high bay lamps. Media center is lit with LED lamps. A few closet areas contain two lamp T8 fluorescent U-bend fixtures. The remaining interior spaces are lit with LED tubes.

Most fixtures are in good condition. All exit signs are LED units. Interior lighting levels were generally sufficient. Lighting fixtures in spaces are controlled by wall switches and occupancy sensors that are either wall or ceiling mounted.

Exterior lighting consists of wall, recessed, and pole LED fixtures that are controlled by photocells.



LED Tubes & LED Fixture

Gym LED High Bay, LED 2x2 & LED Recessed Lamps

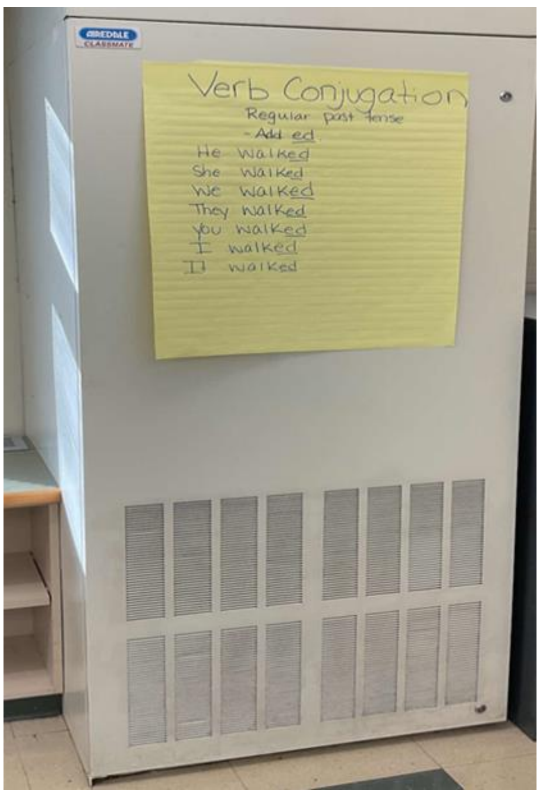


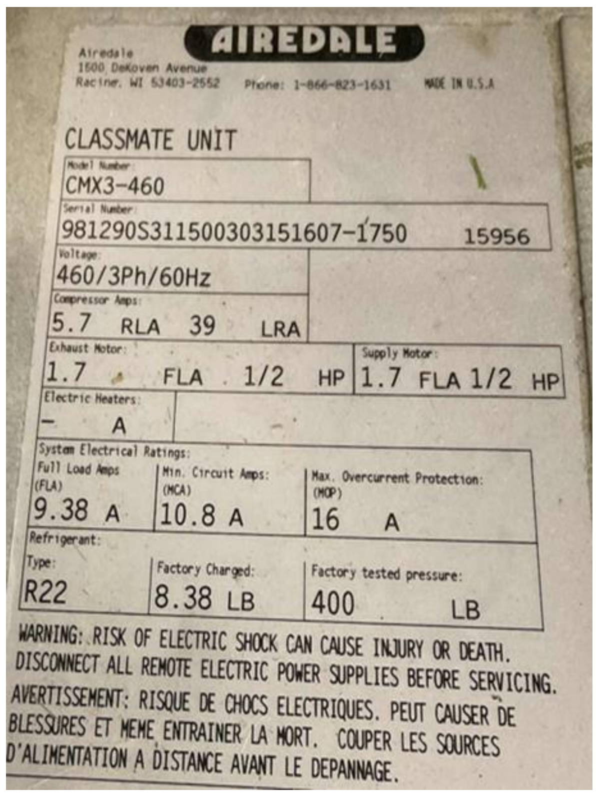
Exterior LED Fixtures

2.5 Air Handling Systems

Unit Ventilators

The classrooms are served by 21 Airedale classmate fan coil units (FCUs). They are equipped with R-22 refrigerant direct expansion (DX) coils, hot water coils, and supply fan motors. The units are in good condition and controlled by the building automation system (BAS).





Typical Classroom Airedale Unit

BAS Screenshot - Airedale Unit

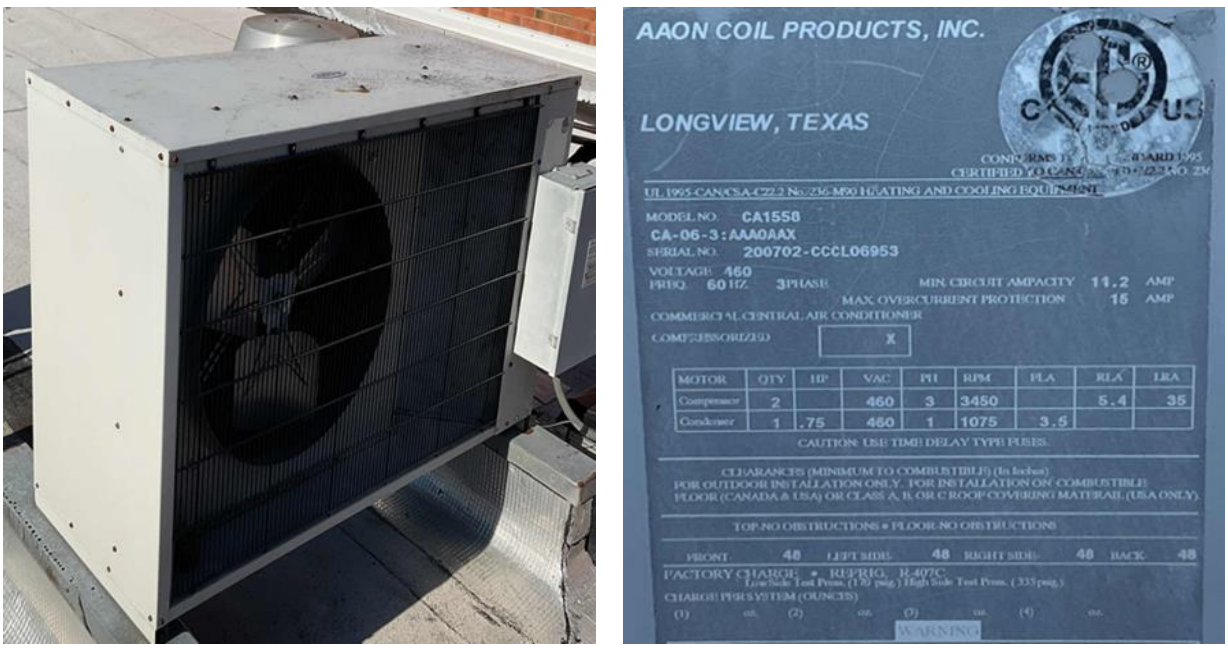
<u>Unitary Electric HVAC Equipment</u>

Spaces including the fire alarm room, server room and the kitchen are cooled using split system air conditioners (ACs). These vary in cooling capacities between 0.75 to 3 tons. They are in good condition and are controlled by programmable thermostats.

The nurse and administration offices are served by two split air source heat pumps that are used as supplemental They each have cooling and heating capacities of 2 tons and 28 MBH respectively. They are in good condition and are controlled via programmable thermostats.

There are four AAON condensing units that serve the cooling coils of AHU-1, 2, 3 and 4. They vary in cooling capacity between 1 to 3 tons. The units have reached the extent of their useful lives and have been evaluated for replacement. The air handling units are further described in an upcoming section.

Ductless Split Systems AC



AAON Condensing Unit

Unitary Heating Equipment

There are four ceiling mounted electric resistance heaters found in spaces including the gym foyer and lobbies. They were not accessible during the audit and the heating capacities were estimated at 5 kW each.

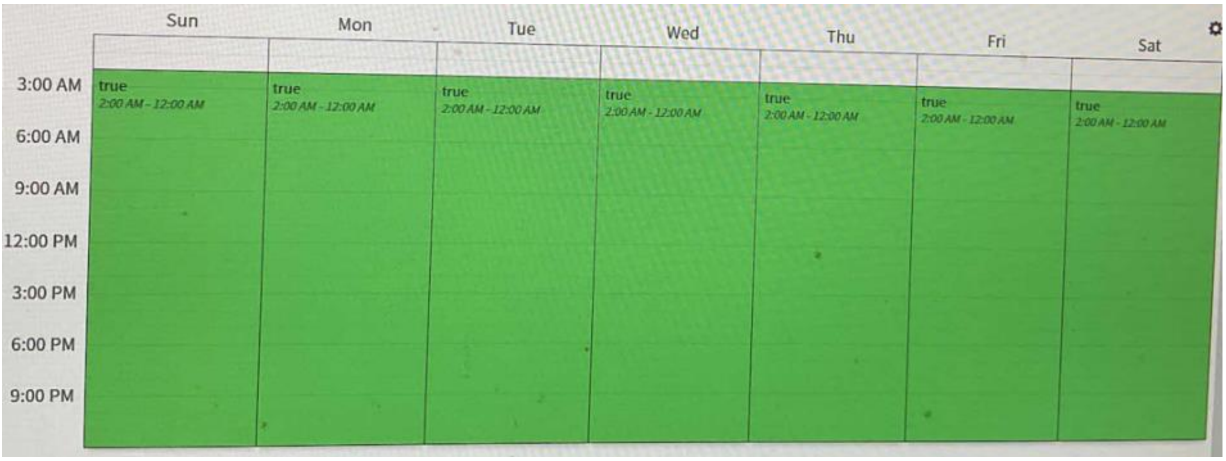
Packaged Units

There are five RTUs (RTU-1, 2, 3, 4 and 5) located on the roof serving the language room, gymnasium, computer room, media center, and locker rooms. The units provide cooling though direct expansion using R-410A refrigerant, and heating using a gas fired section. They have a cooling and heating capacities of 8 tons and 146 MBh respectively. They are equipped with supply and exhaust fans, and economizers that are in fair condition. The supply and exhaust fans of RTU-3 and 4 are equipped with variable frequency drives (VFDs). The units have reached the extent of their useful life and have been evaluated for replacement. They are controlled by the BAS.

According to the RTU BAS schedule screenshot, the units are used seven days a week from 3:00 AM to 10:00 PM. We recommend that facility staff review schedules with occupancy profiles to optimize unit operations.

RTU-2

BAS Screenshot RTU-2



Typical RTU Schedule

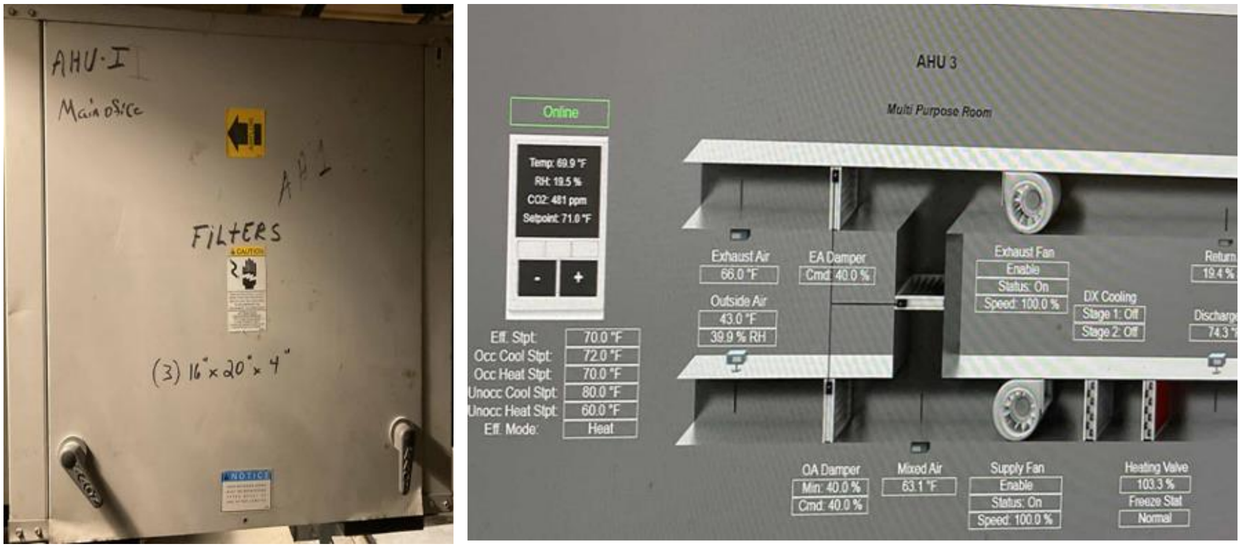
Air Handling Units (AHUs)

Large building spaces including the gymnasium, library, classrooms, offices, and corridors are conditioned by four AHUs located in attic. These units vary in size and are each equipped with a supply fan, a hot water heating coil, and a DX cooling coil connected to outdoor condensing units. AHU-3, serving the multipurpose room, is equipped with both supply and exhaust fans that are controlled by VFDs. The condensing unit sections have been evaluated for replacement. The AHUs appear in good condition.

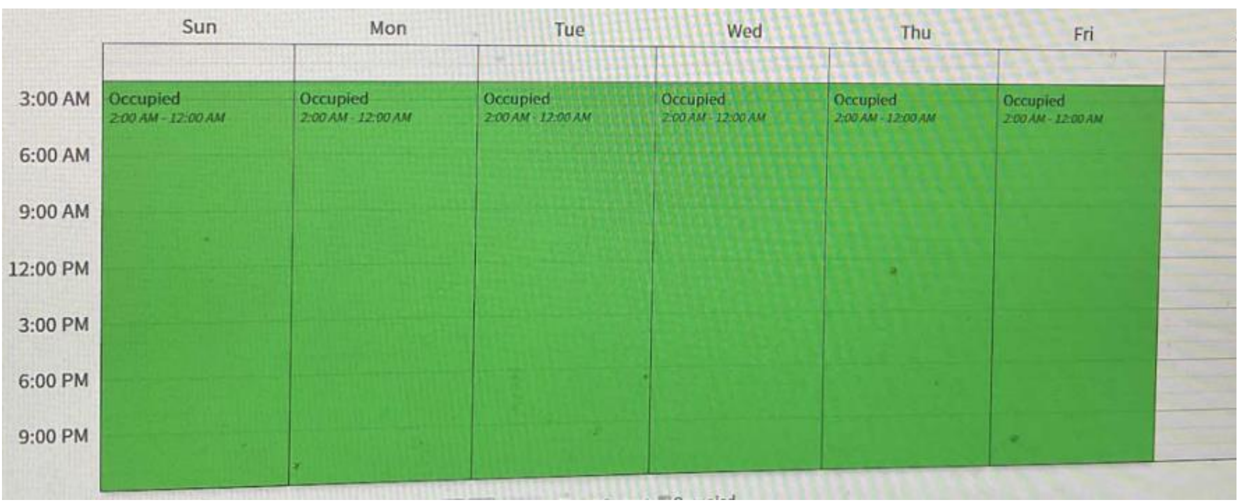
Air distribution is provided to supply air registers by ducts concealed above the ceiling. The building air distribution setpoints are 72°F for cooling and 70°F for heating when occupied, and 80°F for cooling and 60°F for heating when unoccupied. The AHUs are controlled by the BAS.

According to the AHU BAS schedule screenshot, the units are used six days a week from 3:00 AM to 10:00 PM. We recommend that facility staff review schedules with occupancy profiles to optimize unit operations.

- AHU-1 serves the main office
- AHU-2 serves the offices
- AHU-3 serves the multipurpose room
- AHU-4 serves the hallways



AHU-1



Typical AHU Schedule

2.6 Building General Exhaust Air Systems

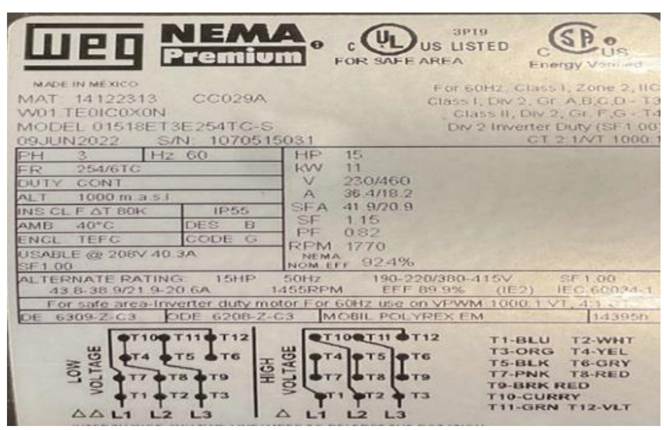
Various general exhaust fans serve the kitchen, restrooms, corridors, classrooms, and other spaces. The exhaust fans each are equipped with a fractional horsepower motor that runs at constant speed. They appear in good condition and are controlled by manual switches.

Typical Exhaust Fan & Kitchen Hood Fan

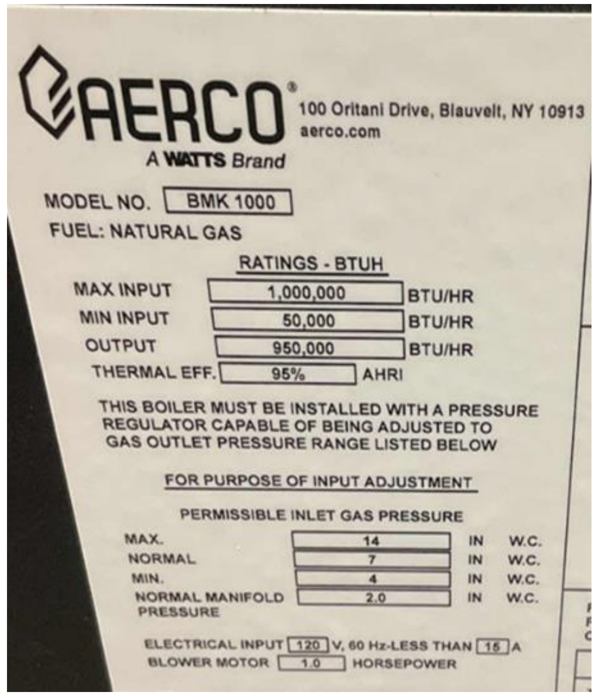
2.7 Heating Hot Water Systems

Four 1,360 MBh Aerco condensing hot water boilers serve the building heating load. The burners are modulating with a nominal efficiency of 95 percent. The boilers are configured in an automated lead-lag control scheme. Installed in 2022, the boilers are in good condition. The hydronic distribution system is 2-pipe, heating only. Two 15 hp constant speed pumps distribute heating hot water to AHUs, Airedale FCUs, hydronic baseboards, and unit heaters.

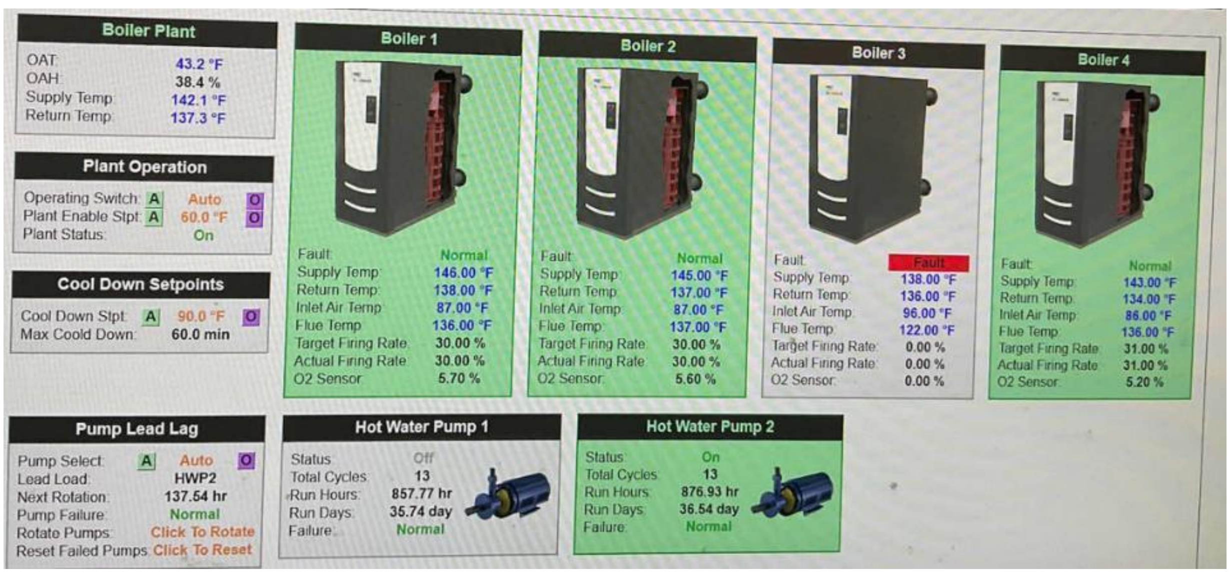
The boilers operate based on outside air temperature. The boilers and the hot water loop are controlled by the BAS. The hot water system is enabled when the outside air temperature is below 60°F. During the audit, the hot water supply and return temperature were respectively 142.1°F and 137.3°F.



Constant Flow Hot Water Distribution Pumps & Motors



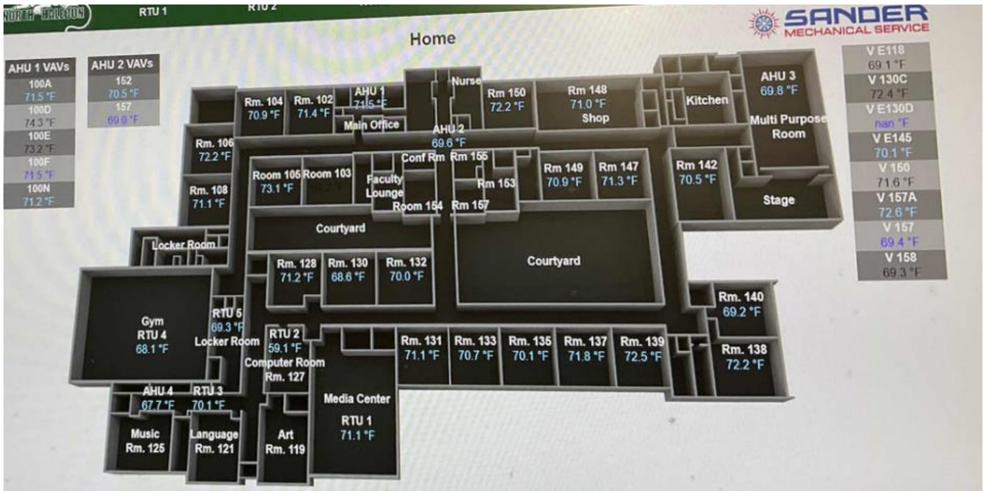
Condensing Boilers



BAS Screenshot - Hot Water Loop

2.8 Building Automation System (BAS)

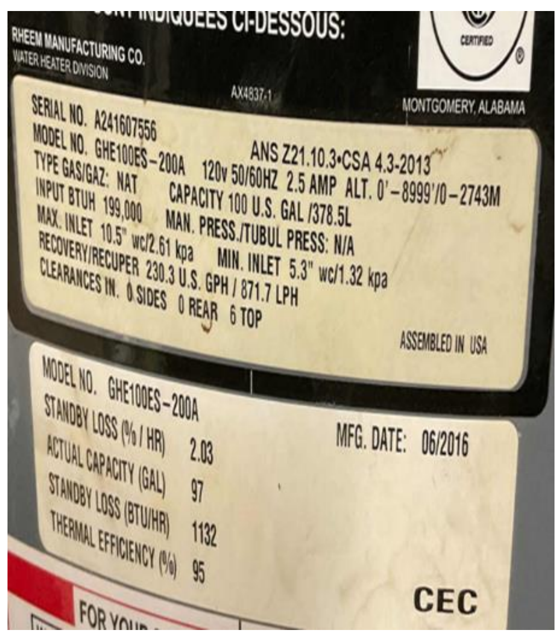
A BAS controls the HVAC equipment, the boilers, the air handlers, the packaged units. The BAS provides equipment scheduling control and monitors and control space temperatures, supply air temperatures, humidity, heating water loop temperatures.



BAS – Main Page

2.9 Domestic Hot Water

Hot water is produced by a Rheem Spiderfire 97 gallon 199.9 MBh gas-fired condensing storage water heater with an efficiency of 95%. The water heater is in the mechanical room. A fractional horsepower circulating pump distributes water to end users. The unit is in good condition and the hot water pipes are insulated.



Condensing Storage Tank Water Heater

2.10 Food Service Equipment

The facility houses a mid-size commercial kitchen that has a mix of gas and electric equipment used to prepare breakfasts and lunches for students. Most cooking is done using gas-fired cooking equipment. Equipment is in good condition.

The dishwasher is an ENERGY STAR high temperature door type unit with a 12-kW electric booster pump.

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

Gas Fired Cooking Equipment

2.11

2.12 Refrigeration

The kitchen has two solid door stand-up refrigerators. The kitchen also has a stand-up glass door refrigerator, a refrigerator chest and a freezer chest. The refrigeration equipment is a mix of high standard efficiency and in good condition.

The kitchen also has a small low temperature walk-in freezer that was not accessible during the audit.

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

Standup Solid & Glass Doors refrigerators

2.13 Plug Load and Vending Machines

There are approximately 38 computer workstations throughout the facility. Plug loads include general cafe and office equipment. There are classroom typical loads such as smart boards, and projectors.

There are three residential style refrigerator and several mini refrigerators in the building. Additional load associated with schools include scanner/copier, small printers, microwaves, and a server.

Scanner/Copier & Residential Style Refrigerator

2.14 Water-Using Systems

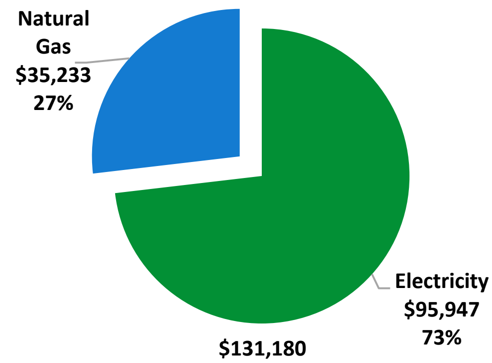
There are several restrooms with toilets, urinals, and sinks. Faucet flow rated as low flow. Toilets are rated at 2.5 gallons per flush (gpf) and urinals are rated at 2.5 gpf.

Typical Restroom Low Flow Devices

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	744,250 kWh	$95,947
Natural Gas	34,106 Therms	$35,233
Total		**$131,180**



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

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

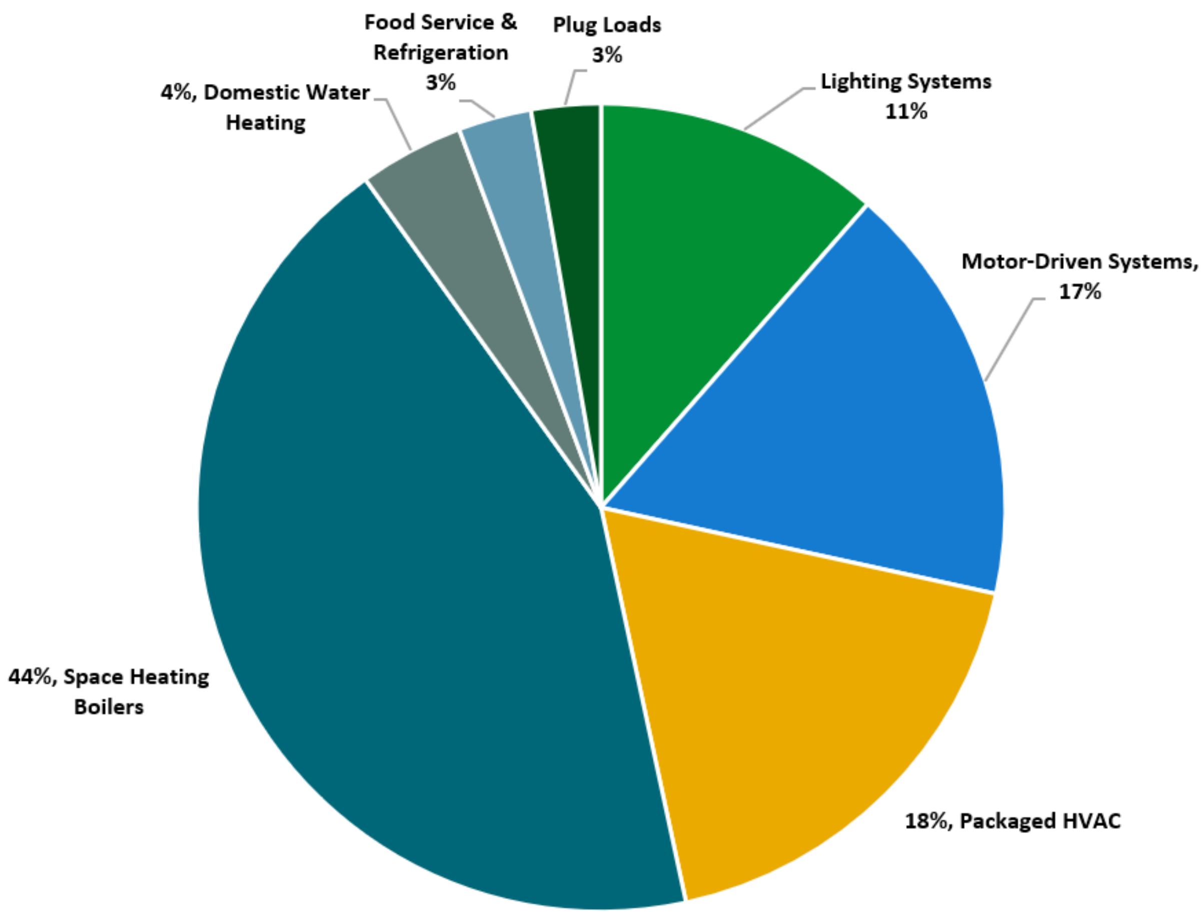
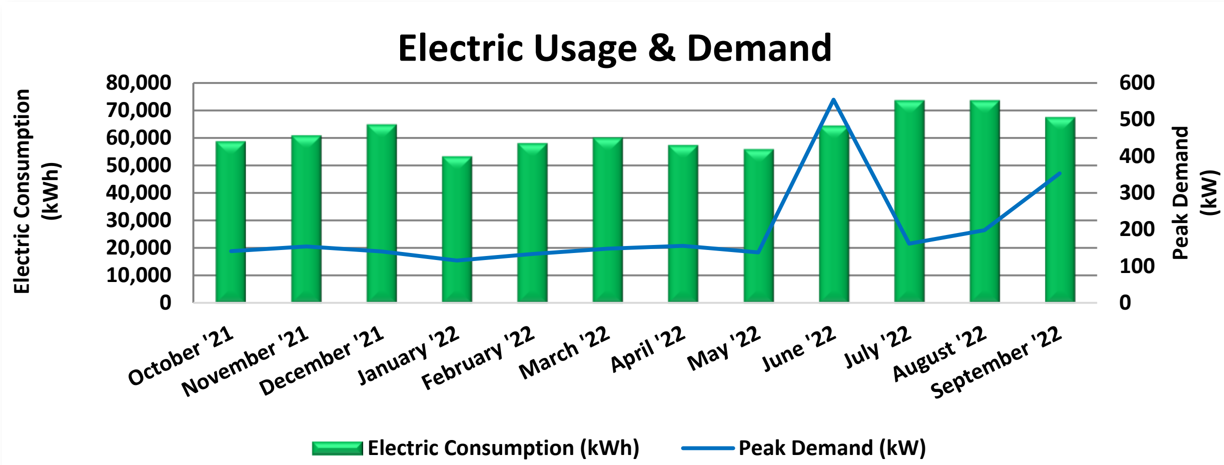


Figure 4 - Energy Balance

3.1 Electricity

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



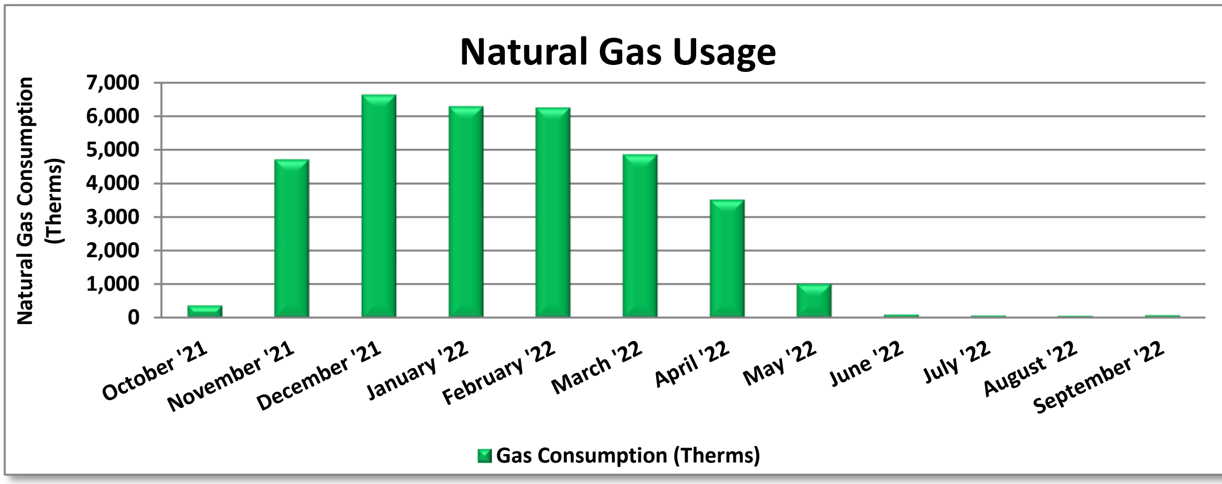
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
10/25/21	31	58,782	141	$533	$7,294
11/21/21	27	60,855	154	$584	$7,304
12/27/21	36	64,931	140	$530	$7,772
1/26/22	30	53,270	116	$439	$6,834
2/25/22	30	58,090	133	$505	$7,210
3/28/22	31	60,095	148	$561	$6,904
4/27/22	30	57,338	156	$590	$7,250
5/25/22	28	55,904	138	$520	$7,020
6/27/22	33	64,387	555	$2,431	$9,508
7/27/22	30	73,575	161	$2,183	$9,661
8/25/22	29	73,588	198	$2,681	$10,079
9/26/22	32	67,513	354	$2,395	$9,635
Totals	**367**	**748,328**	**555**	**$13,951**	**$96,473**
Annual	**365**	**744,250**	**555**	**$13,875**	**$95,947**

Notes:

- Peak demand of 555 kW occurred in June '22.
- Average demand over the past 12 months was 199 kW.
- The average electric cost over the past 12 months was $0.129/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

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



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
10/25/21	31	379	$351
11/23/21	29	4,718	$3,987
12/27/21	34	6,633	$5,191
1/25/22	29	6,290	$7,039
2/24/22	30	6,257	$7,085
3/28/22	32	4,862	$5,603
4/27/22	30	3,519	$3,557
5/26/22	29	1,017	$1,265
6/24/22	29	106	$289
7/26/22	32	75	$246
8/24/22	29	68	$246
9/23/22	30	90	$277
Totals	**364**	**34,013**	**$35,136**
Annual	**365**	**34,106**	**$35,233**

Notes:

- The average gas cost for the past 12 months is $1.033/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

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

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

Benchmarking Score	10

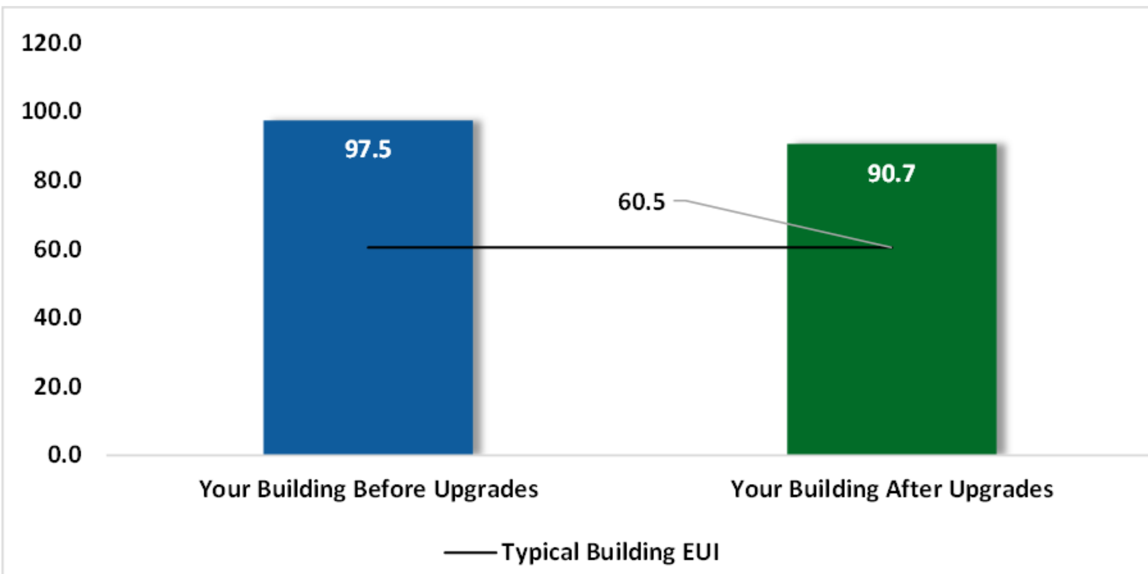


Figure 5 - Energy Use Intensity Comparison[3]

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

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

[3] Based on all evaluated ECMs

Tracking Your Energy Performance

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

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

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

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

4 Energy Conservation Measures

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

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

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

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

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**347**	**0.1**	**0**	**$44**	**$217**	**$30**	**$187**	**4.3**	**341**
ECM 1	Retrofit Fixtures with LED Lamps	Yes	347	0.1	0	$44	$217	$30	$187	4.3	341
Lighting Control Measures			**12,075**	**2.2**	**-3**	**$1,531**	**$8,526**	**$4,560**	**$3,966**	**2.6**	**11,864**
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	6,699	1.3	-1	$849	$3,126	$395	$2,731	3.2	6,582
ECM 3	Install High/Low Lighting Controls	Yes	5,376	1.0	-1	$681	$5,400	$4,165	$1,235	1.8	5,282
Variable Frequency Drive (VFD) Measures			**58,850**	**9.5**	**0**	**$7,587**	**$64,028**	**$4,325**	**$59,703**	**7.9**	**59,261**
ECM 4	Install VFDs on Constant Volume (CV) Fans	Yes	40,933	6.6	0	$5,277	$45,673	$1,925	$43,748	8.3	41,219
ECM 5	Install VFDs on Heating Water Pumps	Yes	17,917	3.0	0	$2,310	$18,354	$2,400	$15,954	6.9	18,042
Unitary HVAC Measures			**11,496**	**5.7**	**6**	**$1,546**	**$96,040**	**$3,843**	**$92,197**	**59.7**	**12,296**
ECM 6	Install High Efficiency Air Conditioning Units	No	11,496	5.7	6	$1,546	$96,040	$3,843	$92,197	59.7	12,296
Food Service & Refrigeration Measures			**1,716**	**0.0**	**0**	**$221**	**$2,496**	**$165**	**$2,331**	**10.5**	**1,728**
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	258	0.0	0	$33	$303	$40	$263	7.9	260
ECM 8	Refrigeration Controls	Yes	1,458	0.0	0	$188	$2,193	$125	$2,068	11.0	1,468
Custom Measures			**17,918**	**0.0**	**63**	**$2,964**	**$4,882**	**$0**	**$4,882**	**1.6**	**25,459**
ECM 9	Optimize HVAC Schedule	Yes	17,918	0.0	63	$2,964	$4,882	$0	$4,882	1.6	25,459
TOTALS			**102,402**	**17.6**	**67**	**$13,892**	**$176,188**	**$12,923**	**$163,266**	**11.8**	**110,950**

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

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

Figure 6 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**347**	**0.1**	**0**	**$44**	**$217**	**$30**	**$187**	**4.3**	**341**
ECM 1	Retrofit Fixtures with LED Lamps	347	0.1	0	$44	$217	$30	$187	4.3	341
Lighting Control Measures		**12,075**	**2.2**	**-3**	**$1,531**	**$8,526**	**$4,560**	**$3,966**	**2.6**	**11,864**
ECM 2	Install Occupancy Sensor Lighting Controls	6,699	1.3	-1	$849	$3,126	$395	$2,731	3.2	6,582
ECM 3	Install High/Low Lighting Controls	5,376	1.0	-1	$681	$5,400	$4,165	$1,235	1.8	5,282
Variable Frequency Drive (VFD) Measures		**58,850**	**9.5**	**0**	**$7,587**	**$64,028**	**$4,325**	**$59,703**	**7.9**	**59,261**
ECM 4	Install VFDs on Constant Volume (CV) Fans	40,933	6.6	0	$5,277	$45,673	$1,925	$43,748	8.3	41,219
ECM 5	Install VFDs on Heating Water Pumps	17,917	3.0	0	$2,310	$18,354	$2,400	$15,954	6.9	18,042
Food Service & Refrigeration Measures		**1,716**	**0.0**	**0**	**$221**	**$2,496**	**$165**	**$2,331**	**10.5**	**1,728**
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	258	0.0	0	$33	$303	$40	$263	7.9	260
ECM 8	Refrigeration Controls	1,458	0.0	0	$188	$2,193	$125	$2,068	11.0	1,468
Custom Measures		**17,918**	**0.0**	**63**	**$2,964**	**$4,882**	**$0**	**$4,882**	**1.6**	**25,459**
ECM 9	Optimize HVAC Schedule	17,918	0.0	63	$2,964	$4,882	$0	$4,882	1.6	25,459
TOTALS		**90,906**	**11.9**	**61**	**$12,347**	**$80,149**	**$9,080**	**$71,069**	**5.8**	**98,654**

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

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

Figure 7 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**347**	**0.1**	**0**	**$44**	**$217**	**$30**	**$187**	**4.3**	**341**
ECM 1	Retrofit Fixtures with LED Lamps	347	0.1	0	$44	$217	$30	$187	4.3	341

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

ECM 1: Retrofit Fixtures with LED Lamps

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

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

Affected Building Areas: closets.

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		**12,075**	**2.2**	**-3**	**$1,531**	**$8,526**	**$4,560**	**$3,966**	**2.6**	**11,864**
ECM 2	Install Occupancy Sensor Lighting Controls	6,699	1.3	-1	$849	$3,126	$395	$2,731	3.2	6,582
ECM 3	Install High/Low Lighting Controls	5,376	1.0	-1	$681	$5,400	$4,165	$1,235	1.8	5,282

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 2: 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: some offices, media center, kitchen, and cafeteria.

ECM 3: Install High/Low Lighting Controls

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

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

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

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

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

Affected Building Areas: corridors.

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**58,850**	**9.5**	**0**	**$7,587**	**$64,028**	**$4,325**	**$59,703**	**7.9**	**59,261**
ECM 4	Install VFDs on Constant Volume (CV) Fans	40,933	6.6	0	$5,277	$45,673	$1,925	$43,748	8.3	41,219
ECM 5	Install VFDs on Heating Water Pumps	17,917	3.0	0	$2,310	$18,354	$2,400	$15,954	6.9	18,042

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

ECM 4: Install VFDs on Constant Volume (CV) Fans

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

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

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

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

Affected Air Handlers: AHUs and RTUs.

ECM 5: Install VFDs on Heating Water Pumps

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

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

Affected Pumps: 15 hp heating hot water pumps.

4.4 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		**11,496**	**5.7**	**6**	**$1,546**	**$96,040**	**$3,843**	**$92,197**	**59.7**	**12,296**
ECM 6	Install High Efficiency Air Conditioning Units	11,496	5.7	6	$1,546	$96,040	$3,843	$92,197	59.7	12,296

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 unitary HVAC units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 6: Install High Efficiency Air Conditioning Units

We evaluated replacing standard efficiency AAON packaged and condensing air conditioning units with high efficiency packaged and condensing air conditioning units. All the packaged replacement units will incorporate efficient gas furnaces. 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: all AAON RTUs and condensing units.

4.5 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**1,716**	**0.0**	**0**	**$221**	**$2,496**	**$165**	**$2,331**	**10.5**	**1,728**
ECM 7	Refrigerator/Freezer Case Electrically Commutated Motors	258	0.0	0	$33	$303	$40	$263	7.9	260
ECM 8	Refrigeration Controls	1,458	0.0	0	$188	$2,193	$125	$2,068	11.0	1,468

ECM 7: Refrigerator/Freezer Case Electrically Commutated Motors

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

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

ECM 8: Refrigeration Controls

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

Many walk-in coolers and freezers have continuously operating electric heaters on the doors to prevent condensation formation. This measure adds a control system feature to shut off the door heaters when the humidity level is low enough that condensation will not occur if the heaters are off. This is done by measuring the ambient humidity and temperature of the store, comparing that to the dewpoint, and using pulse width modulation to control the anti-sweat door heaters.

Defrost controllers can be used to override defrost of evaporator fans when the defrost operation is not necessary, which reduces annual energy consumption. This measure is applicable to existing evaporator fans with a traditional electric de-frost mechanism.

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

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

4.6 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		**17,918**	**0.0**	**63**	**$2,964**	**$4,882**	**$0**	**$4,882**	**1.6**	**25,459**
ECM 9	Optimize HVAC Schedule	17,918	0.0	63	$2,964	$4,882	$0	$4,882	1.6	25,459

ECM 9: Optimize HVAC Schedule

Review and update the HVAC scheduling. The most common use of time-of-day scheduling is to start the HVAC system before the building will be occupied and to shut it off when unoccupied. The HVAC units in this building are running longer than they would be if the schedule were based on normal occupancy.

The building automation system (BAS) can be used to fine tune the schedule. If simple programming changes do not achieve savings while preserving occupant comfort, consider hiring engineering support or engaging your BAS contractor to conduct a retro commissioning study as described in the section below.

4.7 Measures for Future Consideration

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

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

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

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

Retro-Commissioning Study

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

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

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

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

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

5 Energy Efficient Best Practices

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs.

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

You may already be doing some of these things—see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR Portfolio Manager

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

Weatherization

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

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.

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

Lighting Controls

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

Motor Maintenance

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

Fans to Reduce Cooling Load

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

Thermostat Schedules and Temperature Resets

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

Economizer Maintenance

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

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

Ductwork Maintenance

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

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

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

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

Boiler Maintenance

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

Furnace Maintenance

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

Label HVAC Equipment

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

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

Optimize HVAC Equipment Schedules

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

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

Water Heater Maintenance

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

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

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

Water Conservation

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

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

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

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

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

Procurement Strategies

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

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

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

6 On-site Generation

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

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

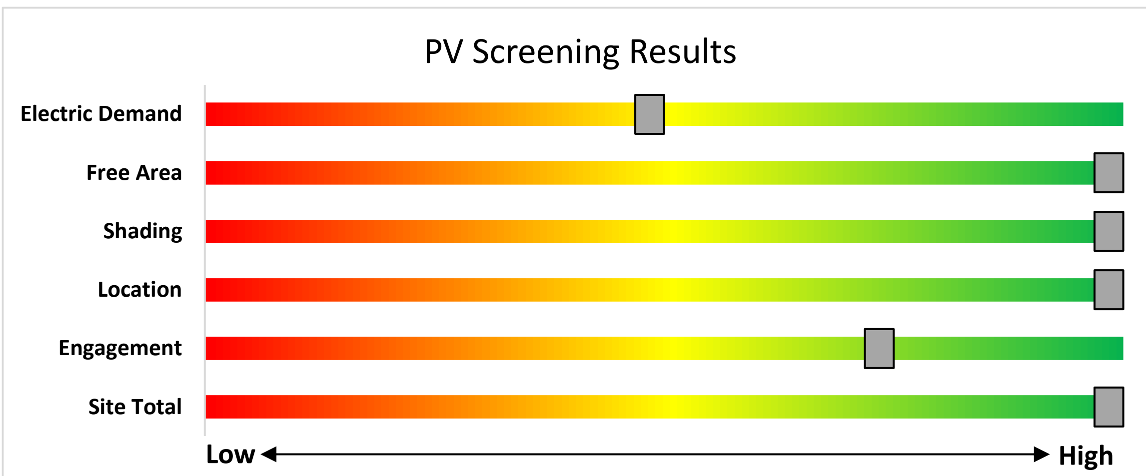
6.1 Solar Photovoltaic

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

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

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

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



Potential	High	
System Potential	199	kW DC STC
Electric Generation	237,083	kWh/yr
Displaced Cost	$30,560	/yr
Installed Cost	$517,400	

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 low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

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

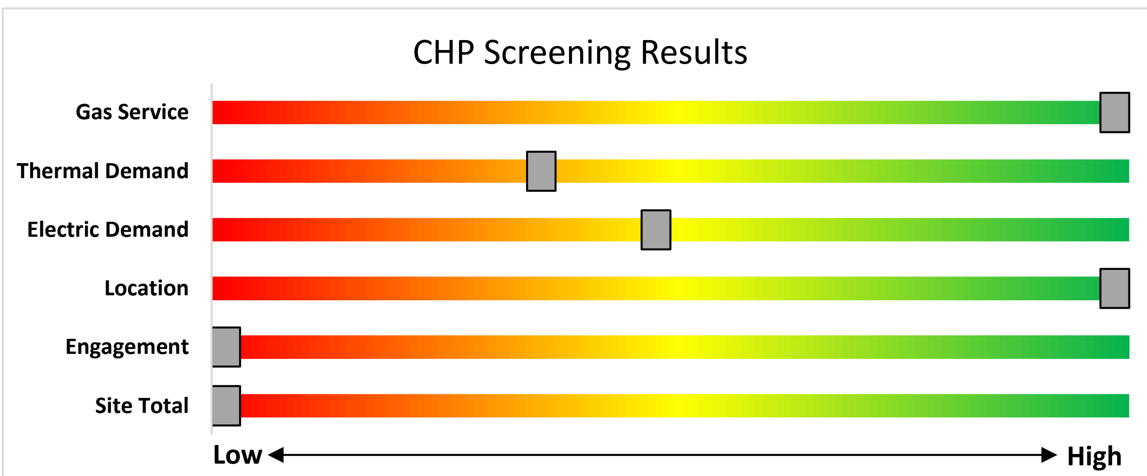


Figure 9 - Combined Heat and Power Screening

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

7 ELECTRIC VEHICLES (EV)

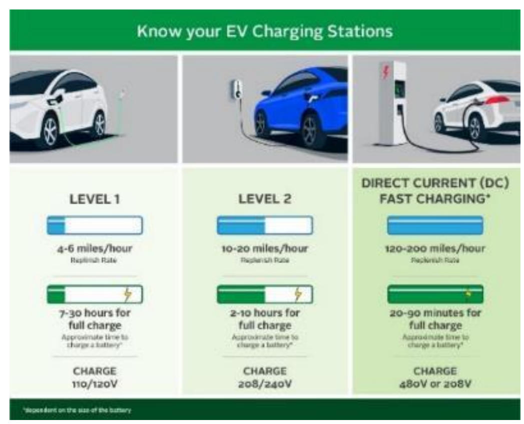
All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes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

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

7.1 Electric Vehicle Charging

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

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



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

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

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

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

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

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

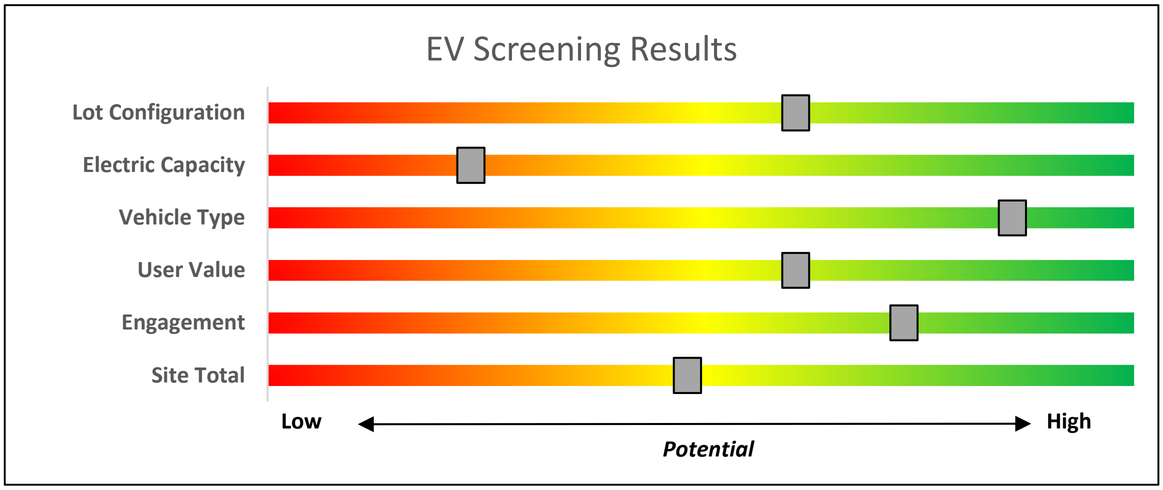


Figure 10 – EV Charger Screening

Electric Vehicle Programs Available

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

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

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

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

8 Project Funding and Incentives

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

8.1 Utility Energy Efficiency Programs

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

Prescriptive and Custom

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

Equipment Examples

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

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

Direct Install

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

Incentives

The program pays up to 70% of the total installed cost of eligible measures.

How to Participate

To participate in Direct Install, you will work with a participating contractor. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the Direct Install program, subject to program rules and eligibility, while the remaining percent of the cost is paid to the contractor by the customer.

Engineered Solutions

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

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

8.2 New Jersey's Clean Energy Programs

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

Large Energy Users

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

Incentives

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

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

How to Participate

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

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

Combined Heat and Power

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

Incentives

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

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

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

How to Participate

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

Successor Solar Incentive Program (SuSI)

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

Administratively Determined Incentive (ADI) Program

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

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

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

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

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

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

Competitive Solar Incentive Program

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

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

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

Energy Savings Improvement Program

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

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

How to Participate

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

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

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

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

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

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

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

9 PROJECT DEVELOPMENT

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

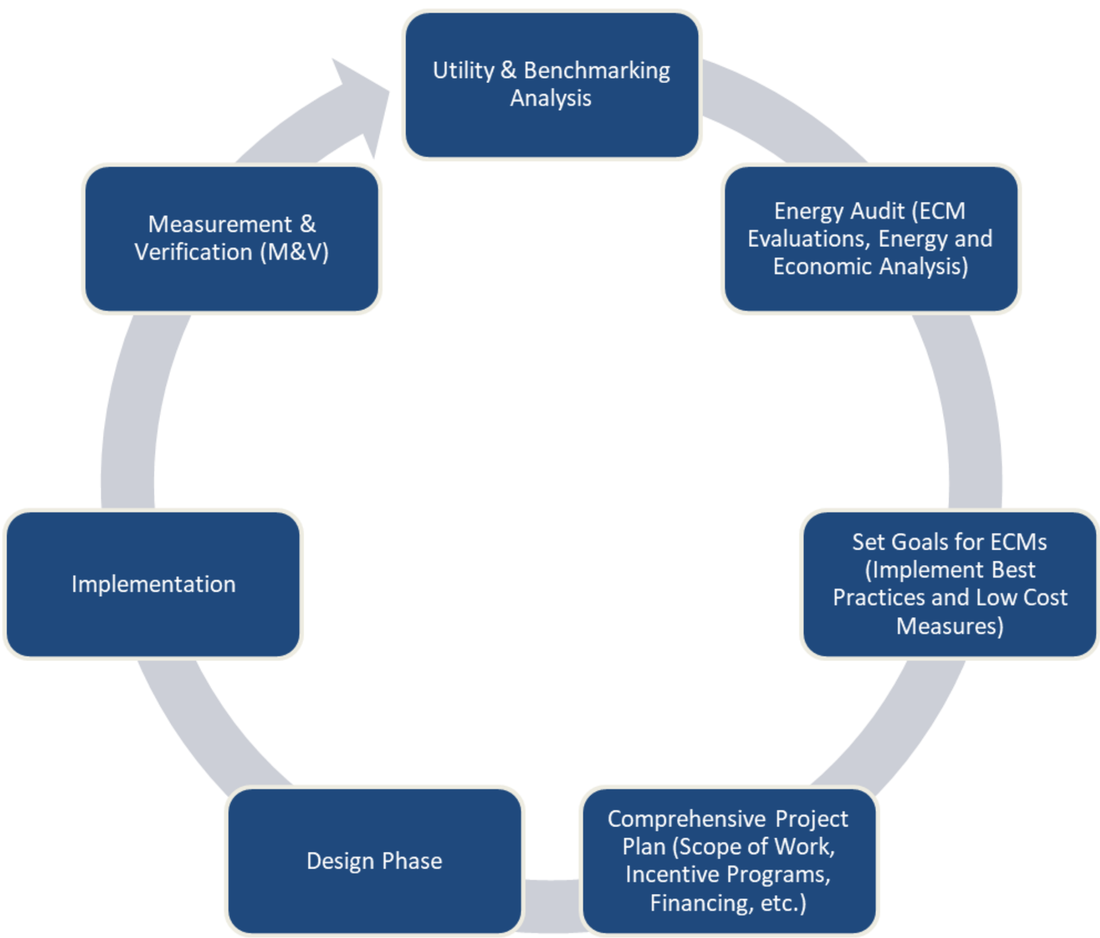


Figure 11 – Project Development Cycle

10 Energy Purchasing and Procurement Strategies

10.1 Retail Electric Supply Options

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

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

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

10.2 Retail Natural Gas Supply Options

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

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

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Boys Locker Room 110	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
Boys Locker Room 110	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Boys Restroom	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Boys Restroom	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Cafeteria	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
Cafeteria	45	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	72	3,630	2	None	Yes	45	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	72	2,505	0.7	4,011	-1	$508	$810	$105	1.4
Classroom 102	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 102	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 103	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 103	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 104	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 104	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 105	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 105	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 106	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 106	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 108	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 108	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 119	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 119	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 121	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 121	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 123	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 123	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 127	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 127	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 127	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 128	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 128	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 130	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 130	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 131	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 131	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 132	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 132	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 133	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 133	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 135	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 135	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 137	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 137	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 138	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	32	3,507		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	32	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 138	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 138	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 139	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 139	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 140	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 140	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 141	26	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	26	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 147	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 147	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 148	25	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	25	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 149	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 149	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 150	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 150	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 153	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	S	18	3,507		None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	18	3,507	0.0	0	0	$0	$0	$0	0.0
Classroom 153	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Closet	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,630	1	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,630	0.0	116	0	$15	$72	$10	4.3
Closet	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	36	3,630	0.0	0	0	$0	$0	$0	0.0
Closet	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	3,630		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	3,630	0.0	0	0	$0	$0	$0	0.0
Closet	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,630	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,505	0.1	313	0	$40	$261	$40	5.6
Closet	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	36	3,630	0.0	0	0	$0	$0	$0	0.0
Closet	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	3,630		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	3,630	0.0	0	0	$0	$0	$0	0.0
Corridor / Main Office	7	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	32	3,630	3	None	Yes	7	LED - Fixtures: Ambient 2x2 Fixture	High/Low Control	32	2,505	0.0	277	0	$35	$450	$245	5.8
Corridor / Mechanical Room	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	32	3,630	3	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	High/Low Control	32	2,505	0.0	79	0	$10	$225	$70	15.4
Corridor / Mechanical Room	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630		None	No	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	38	3,630	0.0	0	0	$0	$0	$0	0.0
Corridor Cafeteria	4	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630	3	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	38	2,505	0.0	188	0	$24	$225	$140	3.6
Corridor East	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 East	26	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630	3	None	Yes	26	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	38	2,505	0.2	1,223	0	$155	$1,125	$910	1.4
Corridor Gym	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 Gym	11	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630	3	None	Yes	11	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	38	2,505	0.1	517	0	$66	$450	$385	1.0
Corridor Middle	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 Middle	5	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	32	3,630	3	None	Yes	5	LED - Fixtures: Ambient 2x2 Fixture	High/Low Control	32	2,505	0.0	198	0	$25	$225	$175	2.0
Corridor Middle	13	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630	3	None	Yes	13	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	38	2,505	0.1	611	0	$78	$675	$455	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Corridor North	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 North	5	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630	3	None	Yes	5	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	38	2,505	0.0	235	0	$30	$225	$175	1.7
Corridor South	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 South	16	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630	3	None	Yes	16	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	38	2,505	0.1	753	0	$95	$675	$560	1.2
Corridor South	5	LED - Fixtures: High-Bay	Wall Switch	S	19	3,630	3	None	Yes	5	LED - Fixtures: High-Bay	High/Low Control	19	2,505	0.0	118	0	$15	$225	$175	3.4
Electrical Room	2	LED - Fixtures: (2) 15.5W LED Lamps	Wall Switch	S	31	3,630		None	No	2	LED - Fixtures: (2) 15.5W LED Lamps	Wall Switch	31	3,630	0.0	0	0	$0	$0	$0	0.0
Exterior Front Entrance	2	LED - Fixtures: (1) 15.5W LED Lamps	Photocell		16	4,380		None	No	2	LED - Fixtures: (1) 15.5W LED Lamps	Photocell	16	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Pole Light	36	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell		120	4,380		None	No	36	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell	120	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Recessed	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		80	4,380		None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	80	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior wall Pack	8	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		30	4,380		None	No	8	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	30	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior wall Pack	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell		50	4,380		None	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	50	4,380	0.0	0	0	$0	$0	$0	0.0
Faculty Room	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Fire Control Room	1	LED Lamps: (1) 30W A19 Screw-In Lamp	Wall Switch	S	30	3,630		None	No	1	LED Lamps: (1) 30W A19 Screw-In Lamp	Wall Switch	30	3,630	0.0	0	0	$0	$0	$0	0.0
Girls Locker Room 116	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
Girls Locker Room 116	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Girls Restroom	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	32	3,507		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	32	3,507	0.0	0	0	$0	$0	$0	0.0
Girls Restroom	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Girls Restroom	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Girls Restroom (1)	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Gym Foyer	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	36	3,630	0.0	0	0	$0	$0	$0	0.0
Gym Office	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	54	3,630		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	54	3,630	0.0	0	0	$0	$0	$0	0.0
Gymnasium	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
Gymnasium	24	LED - Fixtures: High-Bay	Occupancy Sensor	S	179	3,507		None	No	24	LED - Fixtures: High-Bay	Occupancy Sensor	179	3,507	0.0	0	0	$0	$0	$0	0.0
Janitorial	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	36	3,630	0.0	0	0	$0	$0	$0	0.0
Janitorial	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	36	3,630	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
Janitorial	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	36	3,630	0.0	0	0	$0	$0	$0	0.0
Janitorial	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	S	10	3,507		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	3,507	0.0	0	0	$0	$0	$0	0.0
Kitchen	22	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630	2	None	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	2,505	0.2	980	0	$124	$540	$70	3.8
Loading Dock	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630	2	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	2,505	0.0	267	0	$34	$270	$35	6.9
Locker Room Foyer	1	LED - Fixtures: (1) 15.5W LED Lamps	Wall Switch	S	16	3,630		None	No	1	LED - Fixtures: (1) 15.5W LED Lamps	Wall Switch	16	3,630	0.0	0	0	$0	$0	$0	0.0
Main Corridor	25	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630	3	None	Yes	25	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	38	2,505	0.2	1,176	0	$149	$900	$875	0.2
Maintenance OFFICE	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630	2	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	2,505	0.0	178	0	$23	$270	$35	10.4
Mechanical Room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Mechanical Room	10	LED - Fixtures: Downlight Recessed	Wall Switch	S	19	3,630		None	No	10	LED - Fixtures: Downlight Recessed	Wall Switch	19	3,630	0.0	0	0	$0	$0	$0	0.0
Mechanical room Stair	2	LED - Fixtures: (1) 10W A19 Screw-In Lamp	Wall Switch	S	70	3,630		None	No	2	LED - Fixtures: (1) 10W A19 Screw-In Lamp	Wall Switch	70	3,630	0.0	0	0	$0	$0	$0	0.0
Media Center Room 129	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
Media Center Room 129	60	LED Lamps: (2) 15.5W LED Lamps	Occupancy Sensor	S	31	3,507		None	No	60	LED Lamps: (2) 15.5W LED Lamps	Occupancy Sensor	31	3,507	0.0	0	0	$0	$0	$0	0.0
Media Center Room 129	9	LED Lamps: (8) 15.5W LED Lamps	Occupancy Sensor	S	124	3,507		None	No	9	LED Lamps: (8) 15.5W LED Lamps	Occupancy Sensor	124	3,507	0.0	0	0	$0	$0	$0	0.0
Media Center Room 129	72	LED - Fixtures: (1) 15.5W LED Lamps	Occupancy Sensor	S	16	3,507		None	No	72	LED - Fixtures: (1) 15.5W LED Lamps	Occupancy Sensor	16	3,507	0.0	0	0	$0	$0	$0	0.0
Men Restroom	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	36	3,507		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	3,507	0.0	0	0	$0	$0	$0	0.0
Mezzanine	2	LED - Fixtures: (1) 15.5W LED Lamps	Wall Switch	S	16	3,630		None	No	2	LED - Fixtures: (1) 15.5W LED Lamps	Wall Switch	16	3,630	0.0	0	0	$0	$0	$0	0.0
Nurse Examination	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	54	3,630		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	54	3,630	0.0	0	0	$0	$0	$0	0.0
Nurse Examination	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	54	3,630		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	54	3,630	0.0	0	0	$0	$0	$0	0.0
Nurse Office	7	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	38	3,630	2	None	Yes	7	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	38	2,505	0.1	329	0	$42	$270	$35	5.6
Nurse Restroom	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	36	3,630	0.0	0	0	$0	$0	$0	0.0
Office Media Center	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	2,505	0.0	89	0	$11	$116	$20	8.5
Reception Main Office	8	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	54	3,630	2	None	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	2,505	0.1	535	0	$68	$270	$35	3.5
Refrigerator Room	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	72	3,630		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	72	3,630	0.0	0	0	$0	$0	$0	0.0
Rm 100A	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Rm 100B	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	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
Rm 100D	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Rm 100E	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Rm 100F	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Rm 100G	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Roof	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	3,630		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	3,630	0.0	0	0	$0	$0	$0	0.0
Room 143	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	S	72	3,507		None	No	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	72	3,507	0.0	0	0	$0	$0	$0	0.0
Room 152	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Room 154	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Room 155	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Room 157	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0
Server Room	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	3,630	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	2,505	0.0	89	0	$11	$116	$20	8.5
Stage	8	LED - Fixtures: (1) 17W LED PAR 38	Wall Switch	S	17	3,630		None	No	8	LED - Fixtures: (1) 17W LED PAR 38	Wall Switch	17	3,630	0.0	0	0	$0	$0	$0	0.0
Storage	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	1,000	2	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	690	0.0	49	0	$6	$116	$0	18.6
Storage	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	S	36	1,000		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	1,000	0.0	0	0	$0	$0	$0	0.0
Storage	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	20	1,000		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	20	1,000	0.0	0	0	$0	$0	$0	0.0
Storage	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	1,000	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	690	0.0	25	0	$3	$116	$0	37.3
Storage	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	1,000	2	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	690	0.0	37	0	$5	$116	$0	24.8
Storage	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	1,000	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	690	0.0	25	0	$3	$116	$0	37.3
Storage	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	1,000	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	36	690	0.0	25	0	$3	$116	$0	37.3
Storage	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	36	1,000		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	36	1,000	0.0	0	0	$0	$0	$0	0.0
Storage	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	S	10	1,000		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	1,000	0.0	0	0	$0	$0	$0	0.0
Storage	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	75	1,000	2	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	75	690	0.0	51	0	$6	$116	$0	17.9
Women Restroom	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	54	3,507		None	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	54	3,507	0.0	0	0	$0	$0	$0	0.0

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
Mezzanine	Exhaust Fan-Restroom	1	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan-Hallway	1	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan	1	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan-Kitchen	1	Exhaust Fan	1.5	82.0%	No			W	4,118	4	No	86.5%	Yes	1	0.5	2,304	0	$297	$3,887	$75	12.8
Roof	Exhaust Fan-Bathrooms	1	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan-home economic class room	1	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan -hallway	1	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan-Music room/restroom	2	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan Locker room	2	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan Classroom	1	Exhaust Fan	0.3	65.0%	No			W	4,118		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	Hot Water Pumps P1&P2	2	Heating Hot Water Pump	15.0	92.4%	No			W	1,950	5	No	93.0%	Yes	2	3.0	17,917	0	$2,310	$18,354	$2,400	6.9
Roof	Exhaust Fan-Kitchen Hood	1	Kitchen Hood Exhaust Fan	0.8	80.0%	No			W	5,250		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical room	Sump Pump	1	Other	0.8	70.0%	No			W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan-RTU-4	1	Exhaust Fan	7.5	91.7%	Yes			W	5,852		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Supply Fan-RTU-4	1	Supply Fan	10.0	91.7%	Yes			W	5,852		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan-RTU-5	1	Exhaust Fan	2.0	85.5%	No			W	5,852	4	No	86.5%	Yes	1	0.6	3,656	0	$471	$4,605	$100	9.6
Roof	Supply Fan-RTU-5	1	Supply Fan	3.0	90.2%	No			W	5,852	4	No	90.2%	Yes	1	0.9	5,445	0	$702	$4,842	$200	6.6
Roof	Supply Fan-RTU-2	1	Supply Fan	1.0	85.5%	No			W	5,852	4	No	85.5%	Yes	1	0.3	1,915	0	$247	$3,907	$75	15.5
Roof	Exhaust Fan-RTU-2	1	Exhaust Fan	1.0	85.5%	No			W	5,852	4	No	85.5%	Yes	1	0.3	1,788	0	$231	$3,907	$75	16.6
Roof	Supply Fan - AHU-4	1	Supply Fan	3.0	91.7%	No			W	5,852	4	No	91.7%	Yes	1	0.9	5,356	0	$690	$4,842	$200	6.7

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Exhaust Fan-RTU-1	1	Exhaust Fan	2.0	86.5%	No			W	5,852	4	No	86.5%	Yes	1	0.6	3,576	0	$461	$4,605	$100	9.8
Roof	Supply Fan-RTU-1	1	Supply Fan	5.0	90.2%	No			W	5,852	4	No	90.2%	Yes	1	1.4	9,075	0	$1,170	$5,867	$900	4.2
Roof	Supply Fan-RTU-3	1	Supply Fan	5.0	89.7%	Yes			W	5,852		No	89.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan-RTU-3	1	Exhaust Fan	2.0	86.5%	Yes			W	5,852		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Mezzanine	Supply Fan - AHU-1	1	Supply Fan	2.0	85.5%	No			W	5,852	4	No	86.5%	Yes	1	0.6	3,909	0	$504	$4,605	$100	8.9
Mezzanine	Supply Fan - AHU-2	1	Supply Fan	2.0	85.5%	No			W	5,852	4	No	86.5%	Yes	1	0.6	3,909	0	$504	$4,605	$100	8.9
Roof	Supply Fan - AHU-3	1	Supply Fan	5.0	90.2%	Yes			W	5,852		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Exhaust Fan - AHU-3	1	Exhaust Fan	10.0	91.7%	Yes			W	5,852		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Classrooms	Airedale Fan Coil Unit	21	Fan Coil Unit	0.5	70.0%	No			W	5,852		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0

Packaged HVAC Inventory & Recommendations

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/EER)	Heating Mode Efficiency	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Condensing Unit - AHU-4	1	Split-System	1.00		10.00		AAON	CA1299	B	6	Yes	1	Split-System	1.00		16.00		0.2	450	0	$58	$3,428	$105	57.3
Roof	Condensing Unit - AHU-1 & 2	2	Split-System	1.25		10.00		AAON	CA1599	B	6	Yes	2	Split-System	1.25		16.00		0.6	1,125	0	$145	$7,161	$263	47.6
Roof	Condensing Unit - AHU-3	1	Split-System	3.00		10.00		AAON		B	6	Yes	1	Split-System	3.00		16.00		0.7	1,350	0	$174	$5,517	$315	29.9
Various Spaces	Various Spaces	4	Electric Resistance Heat		17.06		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
Classrooms	Airedale Units - Classrooms	21	Fan Coil	3.79	35.00	13.10		Airedale Classmate	CMX-460	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Fire Alarm Closet	1	Split-System	0.75		12.00		Mitsubishi	MU-A09WA	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Server Closet	1	Split-System	1.00		12.00		Mitsubishi		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Kitchen	1	Split-System	3.00		12.00		Mitsubishi	MUY-D36NA	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Language Room 121 - RTU-3	1	Package Unit	8.00	146.00	11.20	0.811111111111111 AFUE	AAON	RM-008	B	6	Yes	1	Package Unit	8.00	146.00	14.00	0.82 Et	0.9	1,714	1	$234	$15,987	$632	65.7
Roof	Gymnasium - RTU-4	1	Package Unit	8.00	146.00	11.20	0.811111111111111 AFUE	AAON	RM-008	B	6	Yes	1	Package Unit	8.00	146.00	14.00	0.82 Et	0.9	1,714	1	$234	$15,987	$632	65.7
Roof	Computer Room - RTU-2	1	Package Unit	8.00	146.00	11.20	0.811111111111111 AFUE	AAON	RM-008	B	6	Yes	1	Package Unit	8.00	146.00	14.00	0.82 Et	0.9	1,714	1	$234	$15,987	$632	65.7
Roof	Media Center - RTU-1	1	Package Unit	8.00	146.00	11.20	0.811111111111111 AFUE	AAON	RM-008	B	6	Yes	1	Package Unit	8.00	146.00	14.00	0.82 Et	0.9	1,714	1	$234	$15,987	$632	65.7
Roof	Locker Rooms - RTU-5	1	Package Unit	8.00	146.00	11.20	0.811111111111111 AFUE	AAON	RM-008	B	6	Yes	1	Package Unit	8.00	146.00	14.00	0.82 Et	0.9	1,714	1	$234	$15,987	$632	65.7
Roof	Nurse & Administration Offices Backup Units	2	Split-System Air-Source HP	2.00	28.00	13.50	8.5 HSPF	Mitsubishi	PUZ-A24N	W		No							0.0	0	0	$0	$0	$0	0.0

Space Heating Boiler Inventory & Recommendations

		Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room	Hydronic Heating System	4	Condensing Hot Water Boiler	950	Aerco	BMK1000	N		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Manufacturer	Model	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room	Domestic Hot Water System	1	Storage Tank Water Heater (> 50 Gal)	Spider Fire	GHE100ES	W		No						0.0	0	0	$0	$0	$0	0.0
Kitchen	Electric Booster Pump/Dishwasher	1	Booster Water Heater	Unknown	Unknown	W		No						0.0	0	0	$0	$0	$0	0.0

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
Refrigeration Room	1	Low Temp Freezer (-35F to -5F)	Bohn	Unknown	7, 8	Yes	Yes	Yes	0.0	1,716	0	$221	$2,496	$165	10.5

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	1	Freezer Chest	Unknown	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)	Carrier	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Refrigerator Chest	Powers	780	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	TRUE	T-49	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	Continental	DL2R	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	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Unknown	Unknown	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Full Size)	Blodgett	Unknown	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	Lockwood	Unknown	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Steamer	Wells	Unknown	Yes		No	0.0	0	0	$0	$0	$0	0.0

Dishwasher Inventory & Recommendations

	Existing Conditions							Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Manufacturer	Model	Water Heater Fuel Type	Booster Heater Fuel Type	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	Payback w/ Incentives in Years
Kitchen	1	Door Type (High Temp)	CMA	180-VL	Electric	N/A	Yes		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**
High Mountain School	1	Clothes Washer	900	No		
High Mountain School	1	Coffee Machine	900	No		
High Mountain School	1	Dehumidifier	480	No		
High Mountain School	38	Desktop	191	No		
High Mountain School	5	Microwave	1,000	No		
High Mountain School	4	Electric Range	1,200	No		
High Mountain School	3	Paper Shredder	150	No		
High Mountain School	7	Printer (Medium/Small)	192	No		
High Mountain School	3	Printer/Copier (Large)	600	No		
High Mountain School	25	Projector	200	No		
High Mountain School	1	Refrigerator (Mini)	207	No		
High Mountain School	3	Refrigerator (Residential)	199	No		
High Mountain School	25	Smart Board	150	No		
High Mountain School	2	Television	120	No		
High Mountain School	1	Water Cooler	500	No		
High Mountain School	1	Server	2,500	No		

Custom (High Level) Measure Analysis

Optimize HVAC Schedule

Building Square Footage	61,025	Fuel Utility Rate	$10.330 MMBtu
Percent of Conditioned Area Impacted	100%	Blended Electric Utility Rate	$0.129 kWh

Existing Conditions						Proposed Conditions					Energy Impact & Financial Analysis										
Description	Area(s)/System(s) Served	Remaining Useful Life	Total HVAC Motor Usage kWh	Total HVAC Electric Usage kWh	Total HVAC Fuel Usage MMBtu	Description	% Savings HVAC Motor Usage kWh	% Savings HVAC Electric Usage kWh	% Savings HVAC Fuel Usage MMBtu	Estimated Cost per Sqft	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Simple Payback w/ Incentives in Years
HVAC Schedule Longer than Occupancy	HVAC Equipment & Systems	2	297,227	152,820	3,167	Optimize HVAC Schedule	5%	2%	2%	$0.08	0.00	17,918	63	$2,964	$4,882	$0	$0	$0	$4,882	1.65	1.65

APPENDIX B: ENERGY STAR STATEMENT OF ENERGY PERFORMANCE

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

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ENERGY STAR® Statement of Energy Performance

10

ENERGY STAR® Score[1]

High Mountain School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 61,025
Built: 1962

For Year Ending: August 31, 2022
Date Generated: December 06, 2022

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
High Mountain School 515 High Mountain Road North Haledon, New Jersey 07508	North Haledon Board of Education 201 Squaw Brook Road North Haledon, NJ 07508 (973) 427-4376	Debra Andreniuk 201 Squaw Brook Road North Haledon, NJ 07508 (973) 427-4376 dandreniuk@nhschools.net

Property ID: 23775400

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
97.7 kBtu/ft²

Source EUI
175.8 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	3,409,947 (57%)
Electric - Grid (kBtu)	2,552,109 (43%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	60.5
National Median Source EUI (kBtu/ft²)	108.9
% Diff from National Median Source EUI	61%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	404

Signature & Stamp of Verifying Professional

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

LP Signature: ______________________Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer or Registered Architect Stamp (if applicable)

Appendix C: Glossary

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

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

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