Local Government Energy Audit Report

Indian Mills Elementary School and Garage

October 13, 2023

Prepared for:
Shamong Township School District
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Shamong, New Jersey 08088

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Disclaimer

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

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

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

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

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

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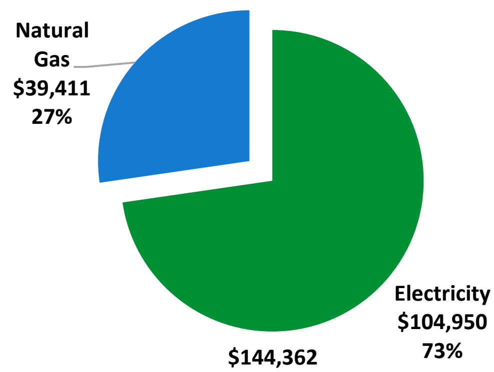
1 Executive Summary

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Indian Mills Elementary School and Garage. 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: $144,362 Electricity: 827,239 kWh Natural Gas: 27,756 Therms	
ENERGY STAR® Benchmarking Score	32 *(1-100 scale)*	This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

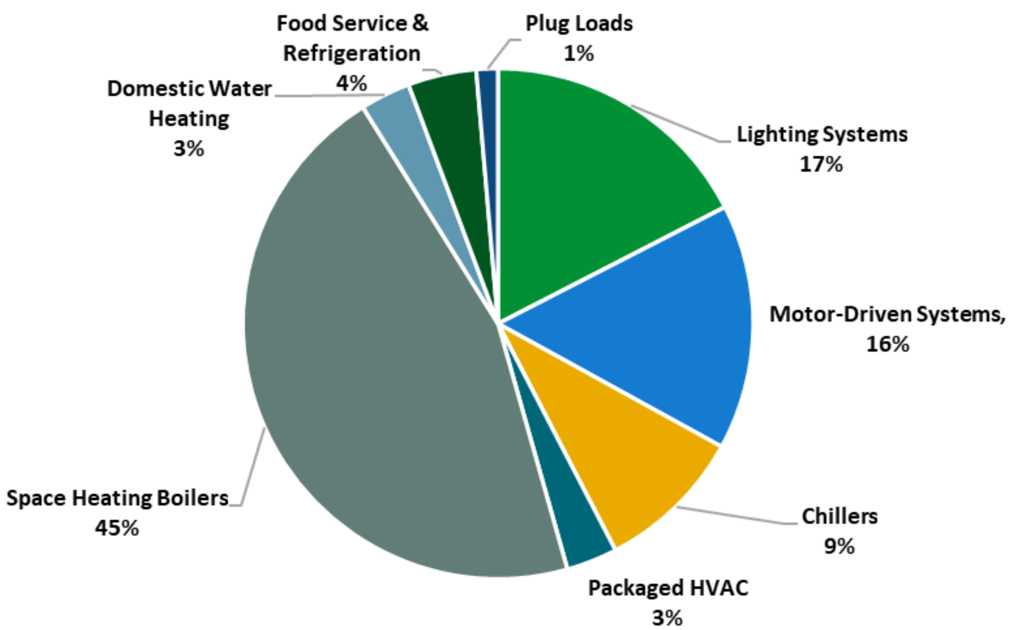


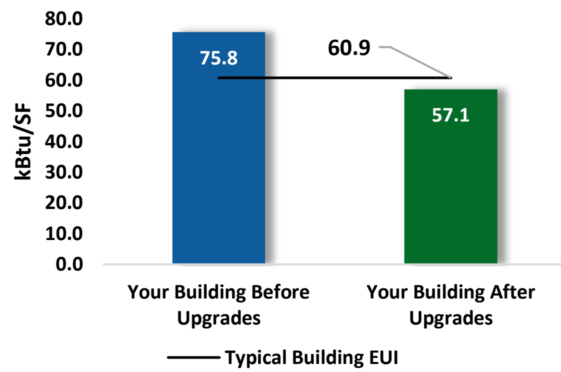
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

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

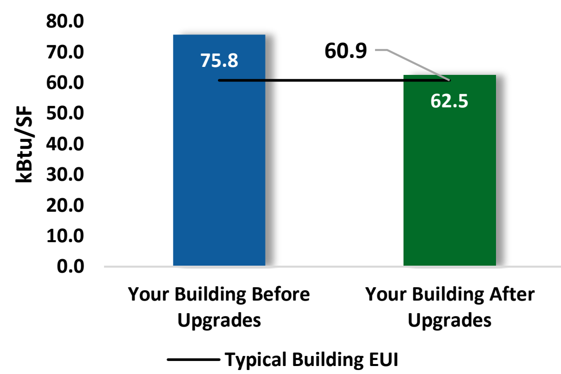
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$404,528
Potential Rebates & Incentives[1]	$36,024
Annual Cost Savings	$39,184
Annual Energy Savings	Electricity: 250,031 kWh Natural Gas: 5,256 Therms
Greenhouse Gas Emission Savings	157 Tons
Simple Payback	9.4 Years
Site Energy Savings (All Utilities)	25%



Scenario 2: Cost Effective Package[2]

Installation Cost	$106,279
Potential Rebates & Incentives	$20,697
Annual Cost Savings	$31,271
Annual Energy Savings	Electricity: 221,044 kWh Natural Gas: 2,273 Therms
Greenhouse Gas Emission Savings	125 Tons
Simple Payback	2.7 Years
Site Energy Savings (all utilities)	18%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**144,228**	**28.7**	**-30**	**$17,873**	**$48,052**	**$11,228**	**$36,824**	**2.1**	**141,733**
ECM 1	Install LED Fixtures	Yes	972	0.0	0	$123	$618	$150	$468	3.8	979
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	32,773	6.8	-7	$4,061	$13,943	$2,165	$11,778	2.9	32,200
ECM 3	Retrofit Fixtures with LED Lamps	Yes	110,483	21.9	-23	$13,689	$33,491	$8,913	$24,578	1.8	108,554
Lighting Control Measures			**46,173**	**9.0**	**-10**	**$5,721**	**$28,704**	**$6,590**	**$22,114**	**3.9**	**45,366**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	37,847	7.8	-8	$4,689	$23,304	$2,775	$20,529	4.4	37,185
ECM 5	Install High/Low Lighting Controls	Yes	8,326	1.2	-2	$1,032	$5,400	$3,815	$1,585	1.5	8,180
Motor Upgrades			**411**	**0.1**	**0**	**$52**	**$2,606**	**$0**	**$2,606**	**49.9**	**414**
ECM 6	Premium Efficiency Motors	No	411	0.1	0	$52	$2,606	$0	$2,606	49.9	414
Variable Frequency Drive (VFD) Measures			**42,351**	**9.8**	**131**	**$7,230**	**$60,740**	**$3,875**	**$56,865**	**7.9**	**57,958**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	20,985	7.4	0	$2,662	$15,874	$2,300	$13,574	5.1	21,132
ECM 8	Install VFDs on Heating Water Pumps	No	16,589	2.5	0	$2,105	$37,851	$1,425	$36,426	17.3	16,705
ECM 9	Install VFDs on Kitchen Hood Fan Motors	Yes	4,777	0.0	131	$2,463	$7,015	$150	$6,865	2.8	20,121
Unitary HVAC Measures			**11,987**	**7.5**	**0**	**$1,521**	**$82,352**	**$4,173**	**$78,180**	**51.4**	**12,070**
ECM 10	Install High Efficiency Air Conditioning Units	No	11,987	7.5	0	$1,521	$82,352	$4,173	$78,180	51.4	12,070
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**277**	**$3,935**	**$145,254**	**$9,730**	**$135,525**	**34.4**	**32,446**
ECM 11	Install High Efficiency Hot Water Boilers	No	0	0.0	277	$3,935	$145,254	$9,730	$135,525	34.4	32,446
HVAC System Improvements			**1,047**	**0.0**	**129**	**$1,958**	**$1,439**	**$12**	**$1,427**	**0.7**	**16,107**
ECM 12	Implement Demand Control Ventilation (DCV)	Yes	1,047	0.0	125	$1,903	$1,359	$0	$1,359	0.7	15,655
ECM 13	Install Pipe Insulation	Yes	0	0.0	4	$55	$80	$12	$68	1.2	451
Domestic Water Heating Upgrade			**0**	**0.0**	**29**	**$408**	**$30,300**	**$57**	**$30,243**	**74.1**	**3,366**
ECM 14	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	21	$300	$30,185	$0	$30,185	100.5	2,477
ECM 15	Install Low-Flow DHW Devices	Yes	0	0.0	8	$108	$115	$57	$57	0.5	889
Food Service & Refrigeration Measures			**3,833**	**0.2**	**0**	**$486**	**$5,080**	**$360**	**$4,720**	**9.7**	**3,860**
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,051	0.1	0	$133	$1,213	$160	$1,053	7.9	1,059
ECM 17	Refrigeration Controls	Yes	2,781	0.0	0	$353	$3,867	$200	$3,667	10.4	2,801
TOTALS (COST EFFECTIVE MEASURES)			**221,044**	**45.3**	**227**	**$31,271**	**$106,279**	**$20,697**	**$85,581**	**2.7**	**249,206**
TOTALS (ALL MEASURES)			**250,031**	**55.3**	**526**	**$39,184**	**$404,528**	**$36,024**	**$368,503**	**9.4**	**313,319**

* - 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 Indian Mills Elementary School and Garage. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs.

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

2.1 Site Overview

On May 24, 2023, TRC performed an energy audit at Indian Mills Elementary School and Garage located in Shamong, New Jersey. TRC met with Todd Hall to review the facility operations and help focus our investigation on specific energy-using systems.

Indian Mills Elementary School and Garage is a multi-story, 73,895 square foot building originally built in 1921, with additions made in 1965. Spaces include classrooms, gymnasium, auditorium, offices, cafeteria, corridors, stairwells, a commercial kitchen, garage, and mechanical space. Although the unheated garage is a separate building it is part of the premises and shares the electric meter with the school.

The building is heated using three gas fired boilers and cooled using one air cooled chiller. The site has solar PV on the roof. The building automation system (BAS) at this location has limited scope and was not accessible at the time of audit.

2.2 Building Occupancy

The facility is occupied Monday through Friday during regular business hours. There are approximately 374 students and 58 staff during operational hours. Janitorial services are performed after hours.

Building Name	Weekday/Weekend	Operating Schedule
Indian Mills Elementary School	Weekday	7:00 AM - 10:00 PM
	Weekend	Limited use
Elementary School Storage Garage	Weekday	Limited use
	Weekend	Limited use

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete with a brick facade. The building roof has both flat and pitched portions. The flat section is covered with black membrane, and it is in good condition. A pitched portion of the roof is covered with asphalt shingles and in need of replacement. An addition built in 2006 has a roof clad with a standing seam roofing system.

Most of the windows are double glazed and have aluminum frames. The glass-to-frame seals are in good condition. The operable window weather seals are in good condition. Exterior doors have aluminum frames and with door seals that are in good condition.

Facade

Flat Roof and Pitched Roof Portions

Exterior Doors

Windows

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. There are also several 40-Watt and 80-Watt T12 fixtures in classrooms 29-50, garage and cafeteria. Typically, the fixture types include 2-lamp, 3-lamp, or 4-lamp, 2-foot or 4-foot troffer, recessed, and surface mounted fixtures and 2-foot fixtures with U-bend or linear tube lamps. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use magnetic ballasts.

Some of the linear fixtures in classrooms, maintenance shops, janitorial sections, and restrooms have been converted to operate LED tube lamps. Additionally, there are some 26-Watt and 42-Watt compact fluorescent lamps (CFL), 12-Watt LED lamps, and 100-Watt incandescent lamps in spaces such as stairwells, storage closets and the stage, respectively.

Gymnasium fixtures have manually controlled high-bay, high-output (HO) 4-foot, 6-lamp linear fluorescent T5 fixtures. All exit signs are 2-Watt LED units.

Most of the interior lighting is controlled using wall switches. Some areas in the 1921 wing have occupancy sensors for lighting control.

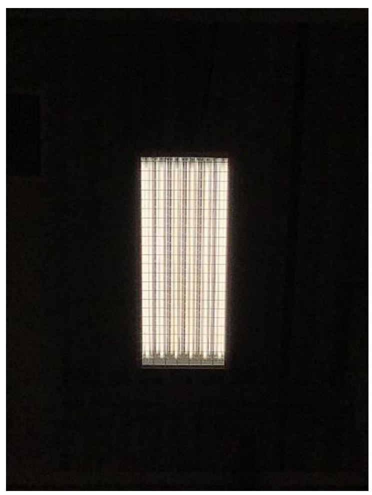
Exterior lighting fixtures consists of 26-Watt CFL fixtures, pole mounted, and wall pack LED fixtures and 70-Watt metal halide fixtures in the courtyard. The exterior fixtures are controlled using a timeclock and are in good condition.

4-foot T8 Fixture – Classroom

Courtyard – Metal Halide Fixture

LED Pole Fixtures

Timeclock



4-foot T5 Fixtures

Occupancy Sensor

2.5 Air Handling Systems

Unit Ventilators

Most areas of the school are conditioned using unit ventilators equipped with supply fan motors and pneumatically controlled outside air dampers and fan coil valves distribution system. They provide heating, cooling, and ventilation to classrooms and other spaces. The units are monitored by the facility BAS and appear to be in fair operating condition.

Unitary Electric HVAC Equipment

Several areas such as offices, lounge, conference room, and the maintenance shop are cooled using split AC units whose cooling capacity ranges from 1 ton to 2.5 tons. The average EER of these units is 9.9. Temperature is controlled using programmable thermostats located in the respective zones. All these units are beyond their useful life and have been evaluated for replacement.

Outdoor Unit – Split AC unit (1921 Boiler Room)

Indoor Mini Split AC Unit

Unitary Heating Equipment

The maintenance shop and storage area in the 1921 section are heated by electric resistance heaters. These are 5 kW units in good condition. Equipment is controlled by a manual dial thermostat within the units.

Electric Resistance Heater – Maintenance Shop

Electric Resistance Heater – Storage 1921 Section

Packaged Units

The gymnasium has a 25-ton McQuay LonMark packaged unit that provides DX cooling and heating through hot water coils supplied by the boiler. The unit has an EER of 10, installed in 2003 and has been evaluated for replacement. Temperature control for this unit is provided by local thermostats.

Refer to Appendix A for detailed information about each unit.

Gymnasium – Packaged Unit

Air Handling Units (AHUs)

The office 16 area is conditioned by a McQuay air handling unit. This unit is equipped with a supply fan motor, hot water heating coil, and chilled water coils for cooling. It is physically located on the roof. The supply fan motor is assumed to be 2 hp, constant speed, and standard efficiency. This unit is controlled by the BAS.

AHU – Office 16

2.6 Heating Hot Water Systems

The building has two boiler rooms, one at each end of the building; 1921 section and the 1965 section.

The 1965 section is served by two Weil McLain non-condensing hot water boilers with an output capacity of 1984 MBh. The burners are fully modulating with a nominal efficiency of 82%. The boilers are configured in lead-lag control scheme. Both boilers are required under high load conditions. Installed in 1995, they are in fair condition and have been evaluated for replacement.

The hot water circulation in this section is provided by six heating hot water pumps (two supply, two return, and two booster pumps). The pumps are constant speed and standard efficiency.

The 1921 section is served by one Burnham non-condensing hot water boiler with an output capacity of 422 MBh. The burner is fully modulating with a nominal efficiency of 80%. Installed in 2004, the unit is in fair condition and has been evaluated for replacement.

Hot water circulation is provided by three constant speed standard efficiency pumps (two supply and one return).

The boilers and the pump operations are all controlled by the building automation system. The BAS was inaccessible at the time of the audit.

Burnham Boiler - 1921 Section

Weil McLain Boiler – 1965 Section

Heating Hot Water Pumps – 1921 Section

Heating Hot Water Pumps – 1965 Section

2.7 Chilled Water Systems

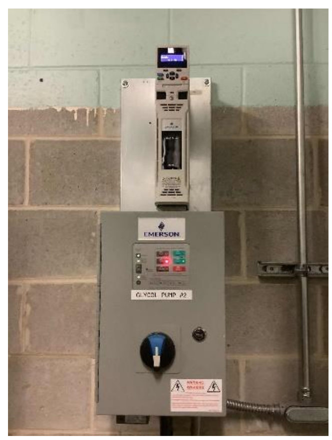
The primary cooling in the school is provided by a York air-cooled scroll chiller with a cooling capacity of 156-tons. The chiller has an efficiency of 10.3 EER, installed in 2015 and is in good condition.

The chilled water from the chiller is distributed to unit ventilators and some air handling units using two, 25 hp variable speed chilled water pumps and two, 7.5 hp variable speed glycol pumps (to maintain consistent flow at operating temperatures). The pumps are configured in a lead-lag fashion and are of standard efficiency. The chiller temperatures, operation and the pump operation are all controlled by the BAS.

Air-Cooled Scroll Chiller

Air-Cooled Scroll Chiller

Chilled Water Pumps



VFD

2.8 Building Automation System (BAS)

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

The level of control provided by the BAS is limited. At the time of audit, the BAS was not accessible at this site.

2.9 Domestic Hot Water

Hot water for the 1965 section of the building is produced by one, 100-gallon, 420 MBh gas-fired AO Smith storage water heater with an 80% efficiency.

Hot water for the 1921 section of the building is produced by the non-condensing hot water heating boiler. During the summer, this boiler is disabled, and the section served does not receive hot water for domestic water needs.

Hot water is distributed to the end uses by fractional horsepower circulation pumps. The domestic hot water pipes are partially insulated, and the insulation is in good condition. Additional insulation measures have been evaluated for the pipes.

DHW – 1965 Section

Storage

2.10 Food Service Equipment

The kitchen has gas cooking equipment with electric food holding cabinets to prepare and store meals for students. Most cooking is done using electric griddle and convection gas-fired oven. Equipment is standard efficiency and is in good condition.

The dishwasher is a non-ENERGY STAR® high temperature, rack type unit with an electric booster heater.

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

Electric Griddle

Convection Oven

2.11 Refrigeration

The kitchen has two stand-up refrigerators with glass doors, refrigerator chest, and freezer chest. All equipment is standard efficiency and in good condition.

The walk-in refrigerator has an estimated 0.67-ton compressor located on the roof and a two-fan evaporator.

The walk-in freezer has a 2.08-ton compressor located on the roof servings a two-fan evaporator.

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

Refrigerator Chest

Freezer Chest

Stand-up Refrigerator

Walk-in Cooler

2.12 Plug Load and Vending Machines

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

There are 85 computer workstations throughout the facility. Plug loads include general cafe and office equipment. There are typical classroom loads such as smartboards, projectors, and fans.

There are several residential-style refrigerators throughout the building that are used to store food belonging to staff members. These vary in condition and efficiency.

Copy Machine

Residential-style Refrigerator

2.13 Water-Using Systems

The faucet flow rates are at 2.2 gallons per minute (gpm) or lower. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

2.14 On-Site Generation

Indian Mills Elementary School has a 75-kW photovoltaic (PV) array with 312 panels. This system provides approximately 13% of the electricity used.

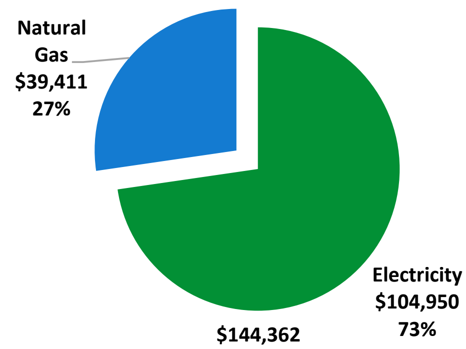
Solar PV on the Roof

Solar PV on the Roof

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	827,239 kWh	$104,950
Natural Gas	27,756 Therms	$39,411
Total		**$144,362**



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

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

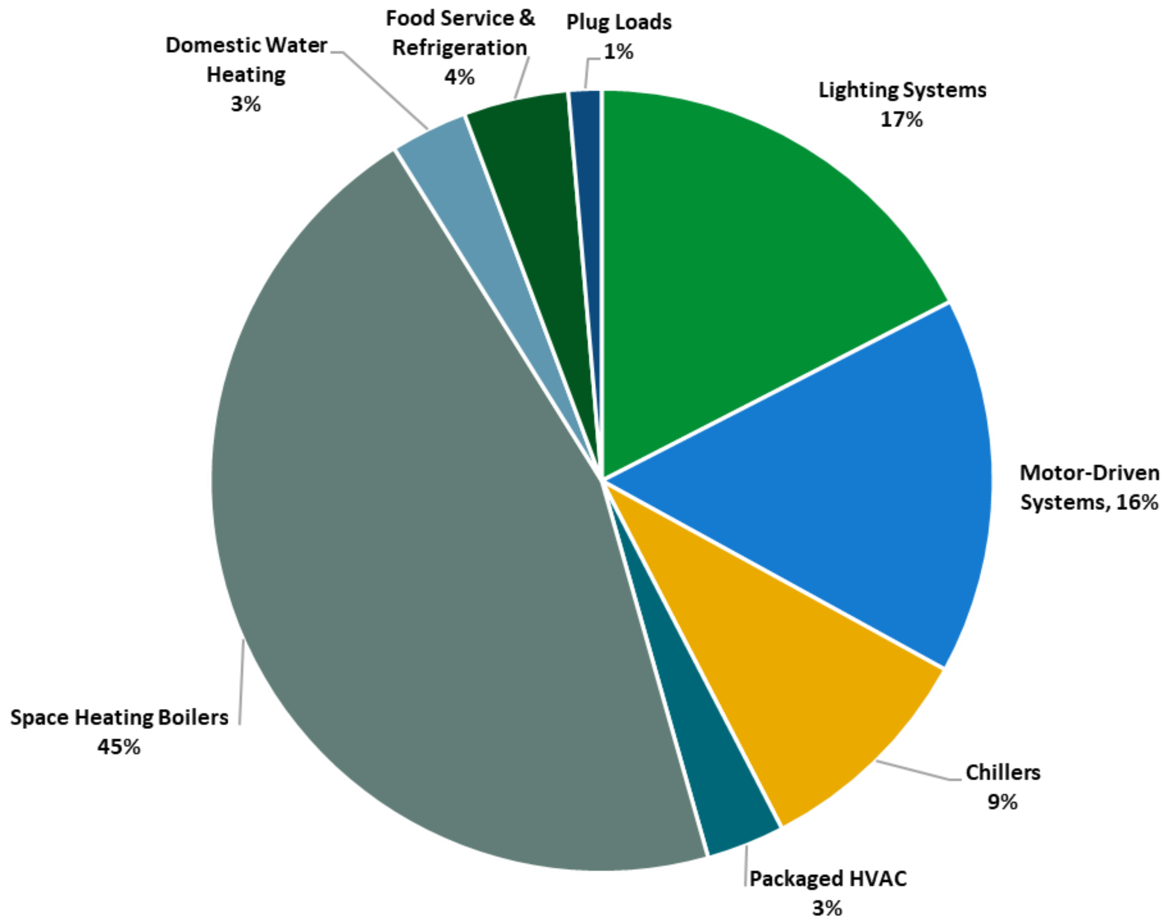
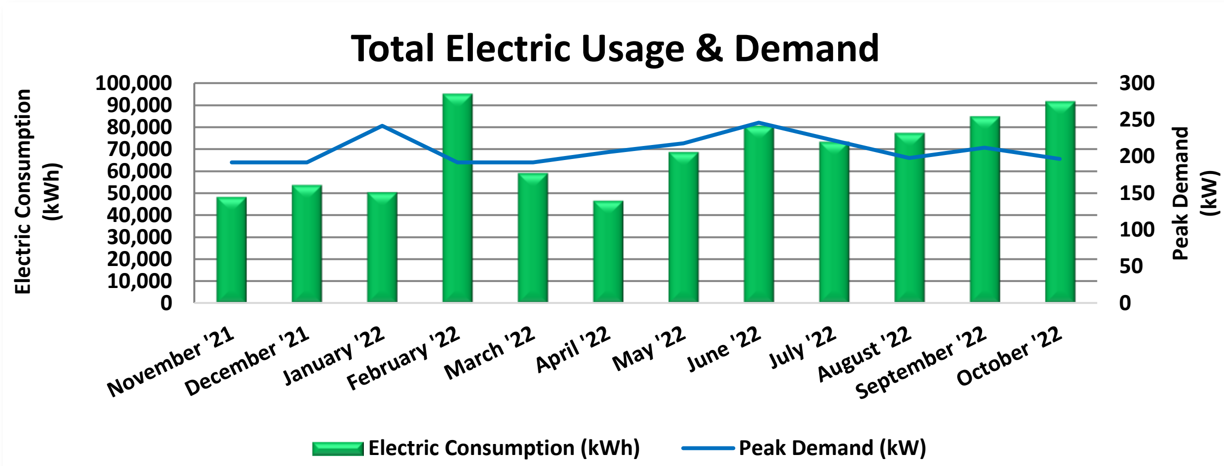
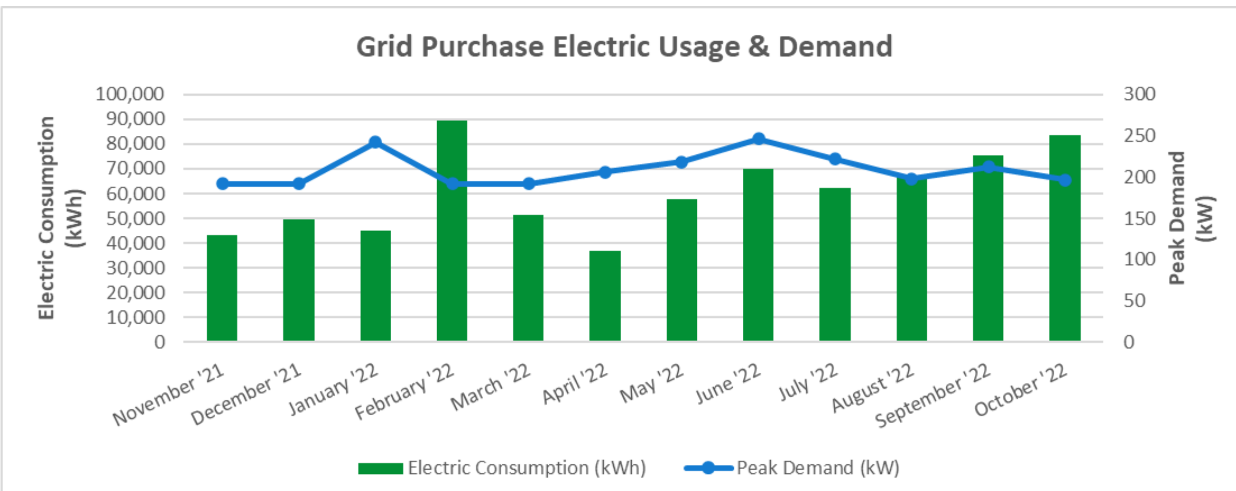


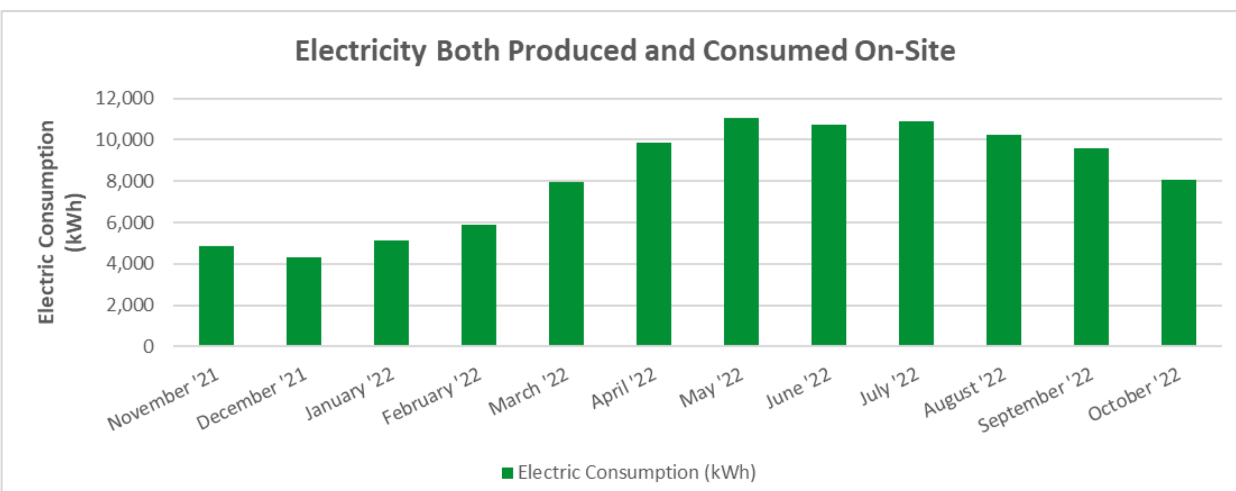
Figure 4 - Energy Balance

3.1 Electricity

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







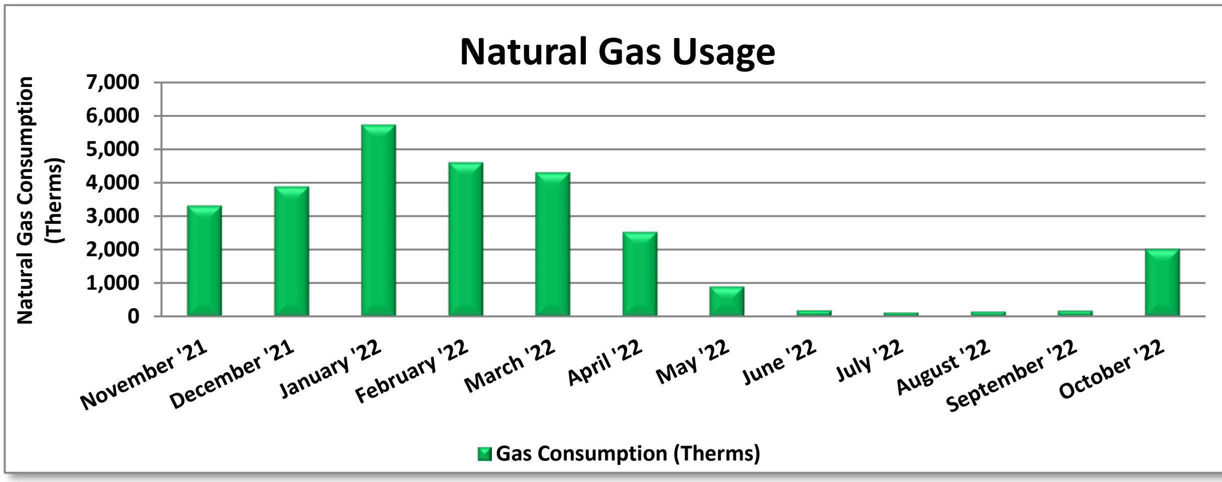
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
12/2/21	29	48,268	192	$2,112	$7,450
1/5/22	34	53,717	192	$2,513	$8,604
2/2/22	28	50,354	242	$2,830	$7,134
3/1/22	27	95,073	192	$2,165	$8,765
4/4/22	34	59,154	192	$2,729	$8,409
5/3/22	29	46,641	206	$2,515	$7,121
6/2/22	30	68,679	218	$2,753	$9,496
7/7/22	35	80,539	246	$3,625	$11,820
8/2/22	26	73,288	222	$2,430	$9,607
9/2/22	31	77,242	198	$2,584	$10,387
10/4/22	32	84,895	212	$2,857	$7,610
11/4/22	31	91,656	197	$2,579	$8,835
Totals	**366**	**829,506**	**246**	**$31,693**	**$105,238**
Annual	**365**	**827,239**	**246**	**$31,606**	**$104,950**

Notes:

- Peak demand of 246 kW occurred in June '22.
- Average demand over the past 12 months was 209 kW.
- The average electric cost over the past 12 months was $0.144/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.
- The first graph shows combined electricity consumption, the second graph shows energy consumed from the grid, and the third graph reflects energy produced by the solar panels and consumed on site.
- The solar meter does not capture kW load and is therefore not displayed on the third graph.

3.2 Natural Gas

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



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
12/2/21	29	3,306	$4,678
1/5/22	34	3,874	$5,427
2/1/22	27	5,718	$8,056
3/1/22	28	4,591	$6,476
4/4/22	34	4,297	$6,074
5/3/22	29	2,516	$3,579
6/2/22	30	896	$1,299
7/7/22	35	185	$304
8/2/22	26	113	$192
9/2/22	31	144	$242
10/4/22	32	175	$287
11/4/22	31	2,017	$2,906
Totals	**366**	**27,832**	**$39,519**
Annual	**365**	**27,756**	**$39,411**

Notes:

- The average gas cost for the past 12 months is $1.420/therm, which is the blended rate used throughout the analysis.
- Summer gas consumption can be attributed to cooking equipment and domestic hot water usage.

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	32

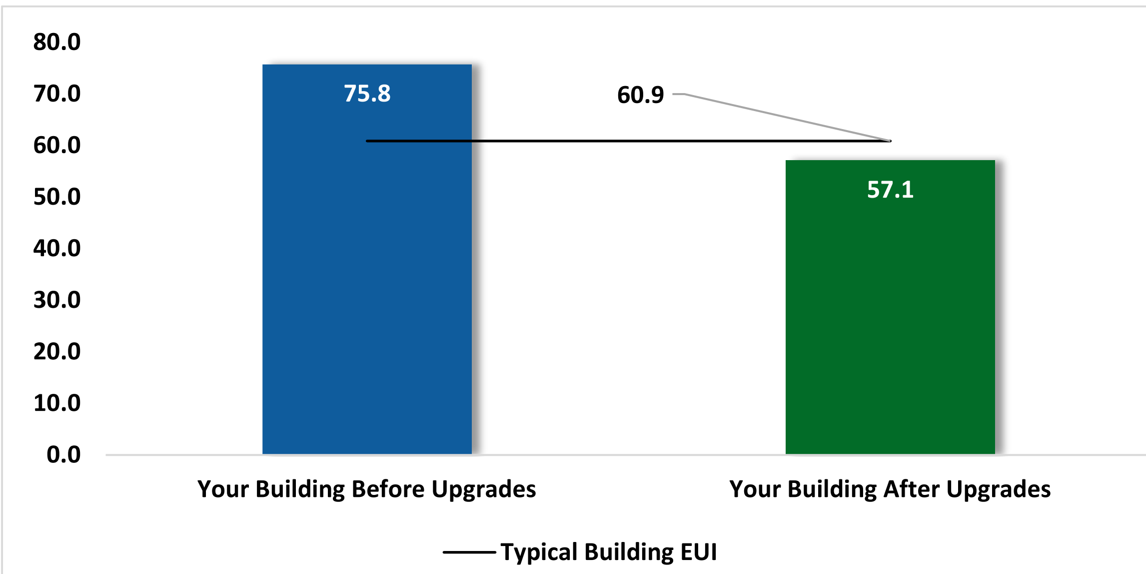


Figure 5 - Energy Use Intensity Comparison[3]

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

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

[3] Based on all evaluated ECMs

Tracking Your Energy Performance

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

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

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

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

4 Energy Conservation Measures

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

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

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

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

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**144,228**	**28.7**	**-30**	**$17,873**	**$48,052**	**$11,228**	**$36,824**	**2.1**	**141,733**
ECM 1	Install LED Fixtures	Yes	972	0.0	0	$123	$618	$150	$468	3.8	979
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	32,773	6.8	-7	$4,061	$13,943	$2,165	$11,778	2.9	32,200
ECM 3	Retrofit Fixtures with LED Lamps	Yes	110,483	21.9	-23	$13,689	$33,491	$8,913	$24,578	1.8	108,554
Lighting Control Measures			**46,173**	**9.0**	**-10**	**$5,721**	**$28,704**	**$6,590**	**$22,114**	**3.9**	**45,366**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	37,847	7.8	-8	$4,689	$23,304	$2,775	$20,529	4.4	37,185
ECM 5	Install High/Low Lighting Controls	Yes	8,326	1.2	-2	$1,032	$5,400	$3,815	$1,585	1.5	8,180
Motor Upgrades			**411**	**0.1**	**0**	**$52**	**$2,606**	**$0**	**$2,606**	**49.9**	**414**
ECM 6	Premium Efficiency Motors	No	411	0.1	0	$52	$2,606	$0	$2,606	49.9	414
Variable Frequency Drive (VFD) Measures			**42,351**	**9.8**	**131**	**$7,230**	**$60,740**	**$3,875**	**$56,865**	**7.9**	**57,958**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	20,985	7.4	0	$2,662	$15,874	$2,300	$13,574	5.1	21,132
ECM 8	Install VFDs on Heating Water Pumps	No	16,589	2.5	0	$2,105	$37,851	$1,425	$36,426	17.3	16,705
ECM 9	Install VFDs on Kitchen Hood Fan Motors	Yes	4,777	0.0	131	$2,463	$7,015	$150	$6,865	2.8	20,121
Unitary HVAC Measures			**11,987**	**7.5**	**0**	**$1,521**	**$82,352**	**$4,173**	**$78,180**	**51.4**	**12,070**
ECM 10	Install High Efficiency Air Conditioning Units	No	11,987	7.5	0	$1,521	$82,352	$4,173	$78,180	51.4	12,070
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**277**	**$3,935**	**$145,254**	**$9,730**	**$135,525**	**34.4**	**32,446**
ECM 11	Install High Efficiency Hot Water Boilers	No	0	0.0	277	$3,935	$145,254	$9,730	$135,525	34.4	32,446
HVAC System Improvements			**1,047**	**0.0**	**129**	**$1,958**	**$1,439**	**$12**	**$1,427**	**0.7**	**16,107**
ECM 12	Implement Demand Control Ventilation (DCV)	Yes	1,047	0.0	125	$1,903	$1,359	$0	$1,359	0.7	15,655
ECM 13	Install Pipe Insulation	Yes	0	0.0	4	$55	$80	$12	$68	1.2	451
Domestic Water Heating Upgrade			**0**	**0.0**	**29**	**$408**	**$30,300**	**$57**	**$30,243**	**74.1**	**3,366**
ECM 14	Install High Efficiency Gas-Fired Water Heater	No	0	0.0	21	$300	$30,185	$0	$30,185	100.5	2,477
ECM 15	Install Low-Flow DHW Devices	Yes	0	0.0	8	$108	$115	$57	$57	0.5	889
Food Service & Refrigeration Measures			**3,833**	**0.2**	**0**	**$486**	**$5,080**	**$360**	**$4,720**	**9.7**	**3,860**
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,051	0.1	0	$133	$1,213	$160	$1,053	7.9	1,059
ECM 17	Refrigeration Controls	Yes	2,781	0.0	0	$353	$3,867	$200	$3,667	10.4	2,801
TOTALS			**250,031**	**55.3**	**526**	**$39,184**	**$404,528**	**$36,024**	**$368,503**	**9.4**	**313,319**

* - 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		**144,228**	**28.7**	**-30**	**$17,873**	**$48,052**	**$11,228**	**$36,824**	**2.1**	**141,733**
ECM 1	Install LED Fixtures	972	0.0	0	$123	$618	$150	$468	3.8	979
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	32,773	6.8	-7	$4,061	$13,943	$2,165	$11,778	2.9	32,200
ECM 3	Retrofit Fixtures with LED Lamps	110,483	21.9	-23	$13,689	$33,491	$8,913	$24,578	1.8	108,554
Lighting Control Measures		**46,173**	**9.0**	**-10**	**$5,721**	**$28,704**	**$6,590**	**$22,114**	**3.9**	**45,366**
ECM 4	Install Occupancy Sensor Lighting Controls	37,847	7.8	-8	$4,689	$23,304	$2,775	$20,529	4.4	37,185
ECM 5	Install High/Low Lighting Controls	8,326	1.2	-2	$1,032	$5,400	$3,815	$1,585	1.5	8,180
Variable Frequency Drive (VFD) Measures		**25,762**	**7.4**	**131**	**$5,125**	**$22,889**	**$2,450**	**$20,439**	**4.0**	**41,253**
ECM 7	Install VFDs on Constant Volume (CV) Fans	20,985	7.4	0	$2,662	$15,874	$2,300	$13,574	5.1	21,132
ECM 9	Install VFDs on Kitchen Hood Fan Motors	4,777	0.0	131	$2,463	$7,015	$150	$6,865	2.8	20,121
HVAC System Improvements		**1,047**	**0.0**	**129**	**$1,958**	**$1,439**	**$12**	**$1,427**	**0.7**	**16,107**
ECM 12	Implement Demand Control Ventilation (DCV)	1,047	0.0	125	$1,903	$1,359	$0	$1,359	0.7	15,655
ECM 13	Install Pipe Insulation	0	0.0	4	$55	$80	$12	$68	1.2	451
Domestic Water Heating Upgrade		**0**	**0.0**	**8**	**$108**	**$115**	**$57**	**$57**	**0.5**	**889**
ECM 15	Install Low-Flow DHW Devices	0	0.0	8	$108	$115	$57	$57	0.5	889
Food Service & Refrigeration Measures		**3,833**	**0.2**	**0**	**$486**	**$5,080**	**$360**	**$4,720**	**9.7**	**3,860**
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	1,051	0.1	0	$133	$1,213	$160	$1,053	7.9	1,059
ECM 17	Refrigeration Controls	2,781	0.0	0	$353	$3,867	$200	$3,667	10.4	2,801
TOTALS		**221,044**	**45.3**	**227**	**$31,271**	**$106,279**	**$20,697**	**$85,581**	**2.7**	**249,206**

* - 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		**144,228**	**28.7**	**-30**	**$17,873**	**$48,052**	**$11,228**	**$36,824**	**2.1**	**141,733**
ECM 1	Install LED Fixtures	972	0.0	0	$123	$618	$150	$468	3.8	979
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	32,773	6.8	-7	$4,061	$13,943	$2,165	$11,778	2.9	32,200
ECM 3	Retrofit Fixtures with LED Lamps	110,483	21.9	-23	$13,689	$33,491	$8,913	$24,578	1.8	108,554

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

ECM 1: Install LED Fixtures

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

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

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

Affected Building Areas: exterior fixtures

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

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

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

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

ECM 3: Retrofit Fixtures with LED Lamps

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

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

Affected Building Areas: all areas with fluorescent fixtures with T8 tubes

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**46,173**	**9.0**	**-10**	**$5,721**	**$28,704**	**$6,590**	**$22,114**	**3.9**	**45,366**
ECM 4	Install Occupancy Sensor Lighting Controls	37,847	7.8	-8	$4,689	$23,304	$2,775	$20,529	4.4	37,185
ECM 5	Install High/Low Lighting Controls	8,326	1.2	-2	$1,032	$5,400	$3,815	$1,585	1.5	8,180

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

ECM 4: Install Occupancy Sensor Lighting Controls

Install occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

Occupancy sensors can be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

Affected Building Areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms

ECM 5: Install High/Low Lighting Controls

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

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

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

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

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

Affected Building Areas: hallways, stairwells

4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**411**	**0.1**	**0**	**$52**	**$2,606**	**$0**	**$2,606**	**49.9**	**414**
ECM 6	Premium Efficiency Motors	411	0.1	0	$52	$2,606	$0	$2,606	49.9	414

ECM 6: Premium Efficiency Motors

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

Affected Motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Roof	Office 16	1	Supply Fan	2.0	Chilled water coil only
Roof	Boiler room	2	Fan Coil Unit	0.8	
Roof	Nurse	1	Supply Fan	0.2	
Roof	Main office conference	1	Supply Fan	0.2	
Roof	Main office	1	Supply Fan	0.2	

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

4.4 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**42,351**	**9.8**	**131**	**$7,230**	**$60,740**	**$3,875**	**$56,865**	**7.9**	**57,958**
ECM 7	Install VFDs on Constant Volume (CV) Fans	20,985	7.4	0	$2,662	$15,874	$2,300	$13,574	5.1	21,132
ECM 8	Install VFDs on Heating Water Pumps	16,589	2.5	0	$2,105	$37,851	$1,425	$36,426	17.3	16,705
ECM 9	Install VFDs on Kitchen Hood Fan Motors	4,777	0.0	131	$2,463	$7,015	$150	$6,865	2.8	20,121

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

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

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

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

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: gymnasium packaged unit

ECM 8: Install VFDs on Heating Water Pumps

We evaluated installing 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: heating hot water pumps serving both boiler rooms

ECM 9: Install VFDs on Kitchen Hood Fan Motors

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

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

4.5 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**11,987**	**7.5**	**0**	**$1,521**	**$82,352**	**$4,173**	**$78,180**	**51.4**	**12,070**
ECM 10	Install High Efficiency Air Conditioning Units	11,987	7.5	0	$1,521	$82,352	$4,173	$78,180	51.4	12,070

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

ECM 10: Install High Efficiency Air Conditioning Units

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

Affected Units: split AC units and the packaged unit serving gymnasium

4.6 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**277**	**$3,935**	**$145,254**	**$9,730**	**$135,525**	**34.4**	**32,446**
ECM 11	Install High Efficiency Hot Water Boilers	0	0.0	277	$3,935	$145,254	$9,730	$135,525	34.4	32,446

ECM 11: Install High Efficiency Hot Water Boilers

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

The most notable efficiency improvement is condensing hydronic boilers that can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers are evaluated when the return water temperature is less than 130°F during most of the operating hours.

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

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

4.7 HVAC Improvements

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**1,047**	**0.0**	**129**	**$1,958**	**$1,439**	**$12**	**$1,427**	**0.7**	**16,107**
ECM 12	Implement Demand Control Ventilation (DCV)	1,047	0.0	125	$1,903	$1,359	$0	$1,359	0.7	15,655
ECM 13	Install Pipe Insulation	0	0.0	4	$55	$80	$12	$68	1.2	451

ECM 12: Implement Demand Control Ventilation (DCV)

Demand control ventilation (DCV) is a control strategy that monitors the indoor air's carbon dioxide (CO_2) content to measure room occupancy. This data is used to regulate the amount of outdoor air provided to the space for ventilation.

Standard ventilation systems often provide outside air based on a space's estimated maximum occupancy but not actual occupancy. During low occupancy periods, the space may then be over ventilated. This wastes energy through heating and cooling the excess outside air flow. DCV reduces unnecessary outdoor air intake by regulating ventilation based on actual occupancy levels. DCV is most suited for facilities where occupancy levels vary significantly from hour to hour and day to day.

Energy savings associated with DCV are based on hours of operation, space occupancy, outside air reduction, and other factors. Energy savings results from eliminating unnecessary ventilation and space conditioning. Implementation of this measure is dependent upon having a building automation system (BAS) or other smart building control system connected to the space conditioning equipment serving the noted areas.

Affected Building Areas: gymnasium

ECM 13: Install Pipe Insulation

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

Affected Systems: domestic hot water piping

4.8 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**29**	**$408**	**$30,300**	**$57**	**$30,243**	**74.1**	**3,366**
ECM 14	Install High Efficiency Gas-Fired Water Heater	0	0.0	21	$300	$30,185	$0	$30,185	100.5	2,477
ECM 15	Install Low-Flow DHW Devices	0	0.0	8	$108	$115	$57	$57	0.5	889

ECM 14: Install High Efficiency Gas-Fired Water Heater

We evaluated replacing the existing tank water heater with a high efficiency condensing tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water, and fewer operating hours to maintain the tank water temperature.

ECM 15: Install Low-Flow DHW Devices

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

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

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

4.9 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**3,833**	**0.2**	**0**	**$486**	**$5,080**	**$360**	**$4,720**	**9.7**	**3,860**
ECM 16	Refrigerator/Freezer Case Electrically Commutated Motors	1,051	0.1	0	$133	$1,213	$160	$1,053	7.9	1,059
ECM 17	Refrigeration Controls	2,781	0.0	0	$353	$3,867	$200	$3,667	10.4	2,801

ECM 16: Refrigerator/Freezer Case Electrically Commutated Motors

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

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

ECM 17: Refrigeration Controls

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

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.

4.10 Measures for Future Consideration

There are additional opportunities for improvement that Shamong Township School District 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.

Shamong Township School District 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.

Eliminate Oversized Domestic Hot Water Heating Systems

The existing domestic hot water (DHW) heating system includes the use of gas-fired storage tank water heaters, which each have a 100-gallon storage capacity. There may be an opportunity to upgrade the system to use smaller, high-efficiency boilers, a local hot water tank heater, or instantaneous tankless hot water heating system. A downsizing of capacity would mitigate losses due to oversized storage and reduce energy consumption. However, this measure was not evaluated, and it is recommended that reconfiguring the water heaters be further evaluated.

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.

Window Treatments/Coverings

Use high-reflectivity films or cover windows with shades or shutters to reduce solar heat gain and reduce the load on cooling and heating systems. Older, single-pane windows and east- or west-facing windows are especially prone to solar heat gain. In addition, use shades or shutters at night during cold weather to reduce heat loss.

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

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.

Thermostat Schedules and Temperature Resets

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

Economizer Maintenance

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

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

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.

Boiler Maintenance

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

Label HVAC Equipment

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

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

Optimize HVAC Equipment Schedules

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

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

Water Heater Maintenance

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

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

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

- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

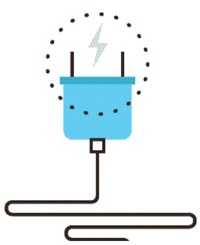
Refrigeration Equipment Maintenance

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

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

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

Plug Load Controls



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

Water Conservation

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

For more information regarding water conservation go to the EPA's WaterSense website[6] or download a copy of EPA's "WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water

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

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

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

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.

6 On-site Generation

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

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

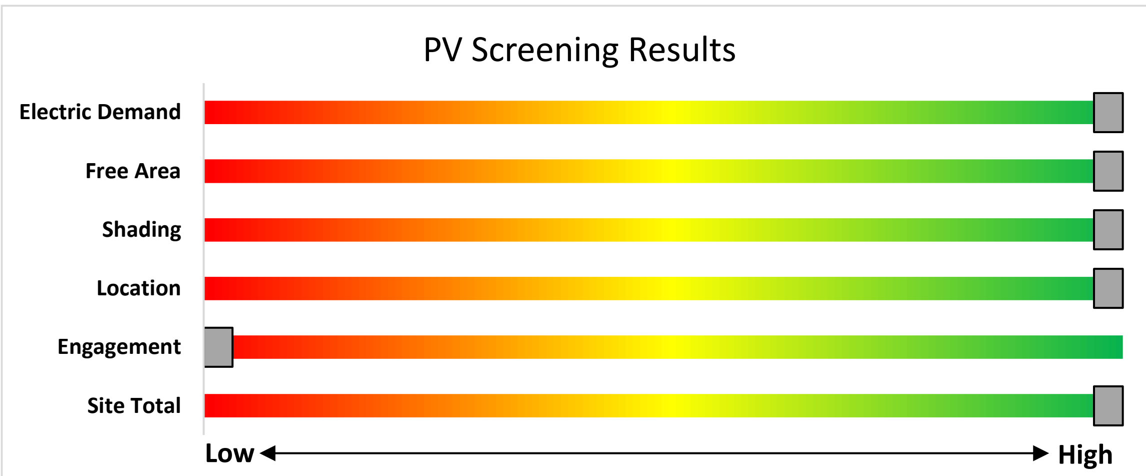
6.1 Solar Photovoltaic

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

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

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

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



Potential	High	
System Potential	209	kW DC STC
Electric Generation	248,996	kWh/yr
Displaced Cost	$31,590	/yr
Installed Cost	$543,400	

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

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

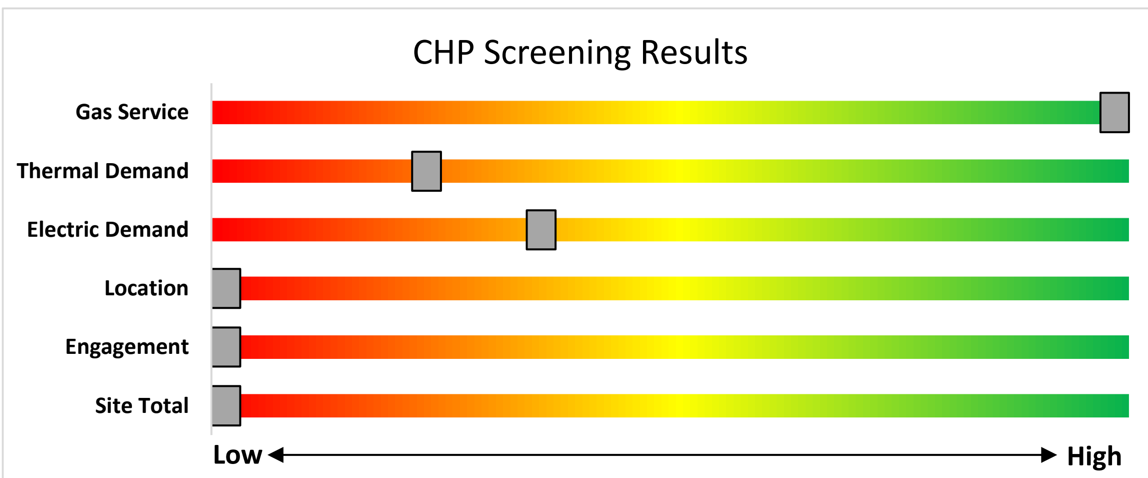


Figure 9 - Combined Heat and Power Screening

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

7 Electric Vehicles (EV)

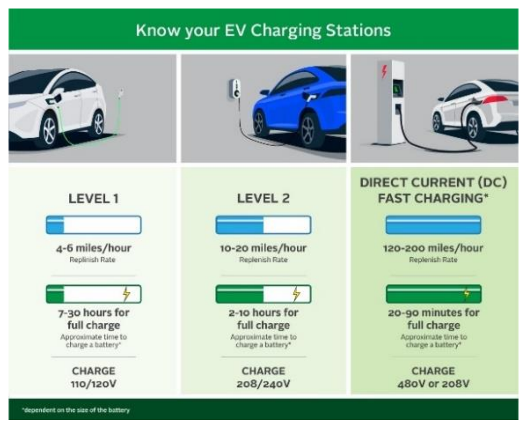
All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes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

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

7.1 Electric Vehicle Charging

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

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



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

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

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

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

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

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

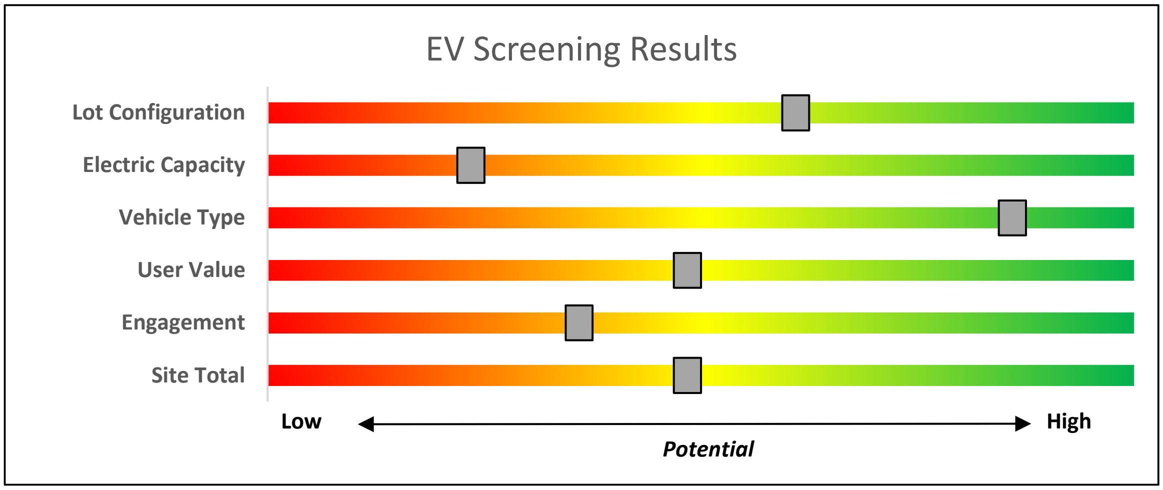


Figure 10 – EV Charger Screening

Electric Vehicle Programs Available

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

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

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

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

8 Project Funding and Incentives

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

8.1 Utility Energy Efficiency Programs

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

Prescriptive and Custom

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

Equipment Examples

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

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

Direct Install

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

Incentives

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

How to Participate

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

Engineered Solutions

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

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

8.2 New Jersey's Clean Energy Programs

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

Large Energy Users

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

Incentives

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

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

How to Participate

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

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

Combined Heat and Power

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

Incentives

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

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

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

How to Participate

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

Successor Solar Incentive Program (SuSI)

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

Administratively Determined Incentive (ADI) Program

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

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

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

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

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

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

Competitive Solar Incentive Program

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

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

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

Energy Savings Improvement Program

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

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

How to Participate

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

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

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

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

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

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

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

9 Project Development

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

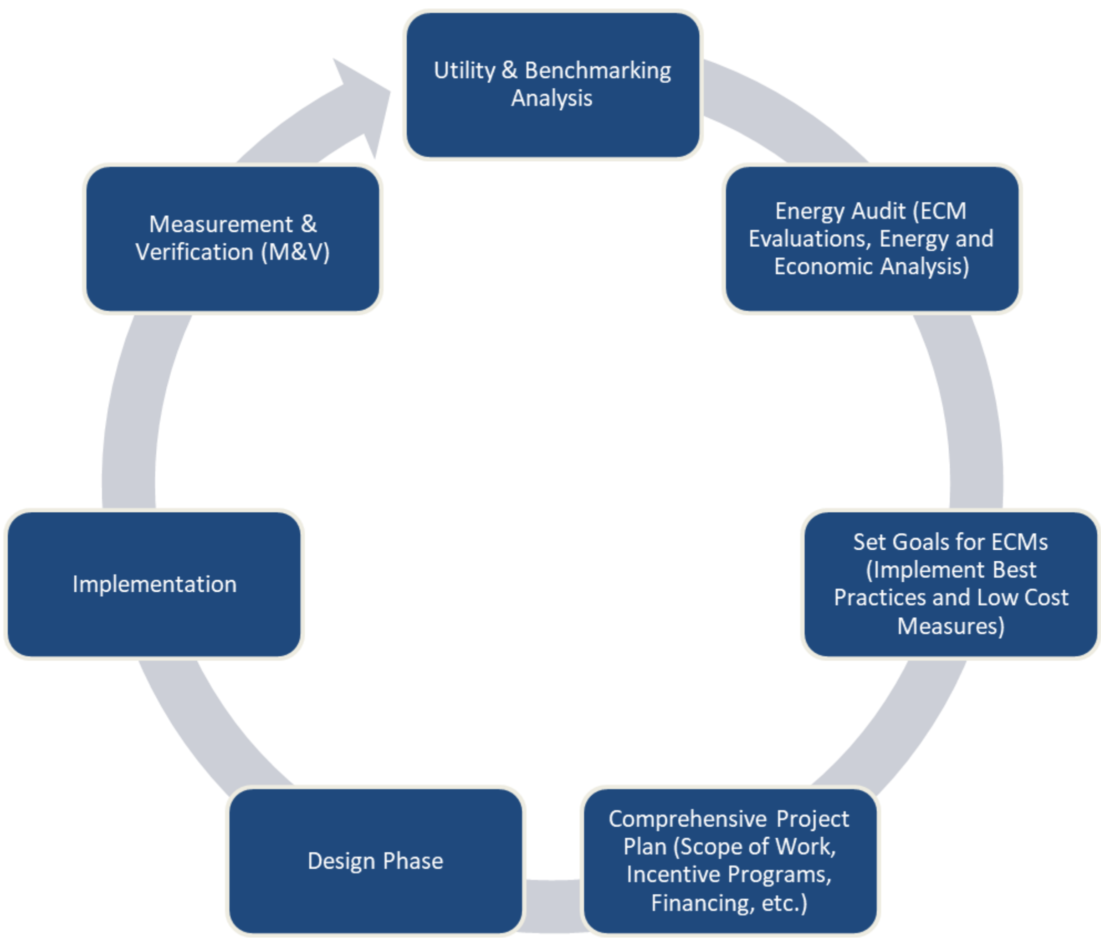


Figure 11 – Project Development Cycle

10 Energy Purchasing and Procurement Strategies

10.1 Retail Electric Supply Options

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

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

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

10.2 Retail Natural Gas Supply Options

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

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

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Cafeteria	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
Cafeteria	25	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	25	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	1.9	9,830	-2	$1,218	$3,757	$570	2.6
Classroom 1	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,300	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	58	0	$7	$33	$6	3.7
Classroom 1	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.6	3,201	-1	$397	$1,307	$280	2.6
Classroom 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,300	0.0	203	0	$25	$73	$20	2.1
Classroom 10	12	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	3,300	4	None	Yes	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	2,277	0.1	675	0	$84	$270	$35	2.8
Classroom 11	12	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	3,300	4	None	Yes	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	2,277	0.1	675	0	$84	$270	$35	2.8
Classroom 1B	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	1,074	0	$133	$562	$115	3.4
Classroom 2	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.6	3,201	-1	$397	$1,307	$280	2.6
Classroom 23	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.5	2,417	-1	$299	$927	$215	2.4
Classroom 29	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.5	2,359	0	$292	$1,042	$155	3.0
Classroom 29	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 2B	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	806	0	$100	$489	$95	3.9
Classroom 3	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.6	3,201	-1	$397	$1,307	$280	2.6
Classroom 31	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.5	2,359	0	$292	$1,042	$155	3.0
Classroom 31	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 33	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.5	2,359	0	$292	$1,042	$155	3.0
Classroom 33	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 34 LED	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,300	4	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.0	131	0	$16	$270	$35	14.5
Classroom 34 LED	6	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	S	72	3,300	4	None	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.1	486	0	$60	$0	$0	0.0
Classroom 34 LED	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,300		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	0	0	$0	$0	$0	0.0
Classroom 35	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,300		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	0	0	$0	$0	$0	0.0
Classroom 35	9	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	9	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.7	3,539	-1	$438	$1,428	$215	2.8
Classroom 35	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 36	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,300		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	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 36	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.5	2,359	0	$292	$1,042	$155	3.0
Classroom 36	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 37	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,300		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	0	0	$0	$0	$0	0.0
Classroom 37	9	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	9	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.7	3,539	-1	$438	$1,428	$215	2.8
Classroom 37	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 38	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,300	4	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.0	131	0	$16	$0	$0	0.0
Classroom 38	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,300		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	0	0	$0	$0	$0	0.0
Classroom 38	9	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	9	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.7	3,539	-1	$438	$1,428	$215	2.8
Classroom 39	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,300		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	0	0	$0	$0	$0	0.0
Classroom 39	9	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	9	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.7	3,539	-1	$438	$1,428	$215	2.8
Classroom 39	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 3B	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	806	0	$100	$489	$95	3.9
Classroom 4	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.6	3,201	-1	$397	$1,307	$280	2.6
Classroom 4	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,277	0.1	427	0	$53	$217	$30	3.5
Classroom 40	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,744	-1	$340	$927	$215	2.1
Classroom 41	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.4	1,829	0	$227	$708	$155	2.4
Classroom 42	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,744	-1	$340	$927	$215	2.1
Classroom 43	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.4	1,829	0	$227	$708	$155	2.4
Classroom 44	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,744	-1	$340	$927	$215	2.1
Classroom 45	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.5	2,744	-1	$340	$927	$215	2.1
Classroom 47	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	$15	$37	$10	1.8
Classroom 47	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.6	2,972	-1	$368	$982	$230	2.0
Classroom 47	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	$57	$110	$30	1.4
Classroom 48	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.5	2,359	0	$292	$1,042	$155	3.0
Classroom 48	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 49	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.5	2,359	0	$292	$1,042	$155	3.0
Classroom 49	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 5	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.6	3,048	-1	$378	$1,270	$270	2.6
Classroom 50	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	3,300	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	2,277	0.5	2,359	0	$292	$1,042	$155	3.0
Classroom 50	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	610	0	$76	$146	$40	1.4
Classroom 7	12	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	3,300	4	None	Yes	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	2,277	0.1	675	0	$84	$270	$35	2.8
Classroom 8	12	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	3,300	4	None	Yes	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	2,277	0.1	675	0	$84	$270	$35	2.8
Classroom 9	12	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	3,300	4	None	Yes	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	2,277	0.1	675	0	$84	$270	$35	2.8
Classroom Art 19	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	$57	$110	$30	1.4
Classroom Art 19	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.6	2,954	-1	$366	$1,073	$255	2.2
Classroom Music 21	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	$57	$110	$30	1.4
Classroom Music 21	13	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	13	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.7	3,491	-1	$433	$1,219	$295	2.1
Computer Lab 25	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.4	1,829	0	$227	$708	$155	2.4
Conference - Principal	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	1,074	0	$133	$562	$115	3.4
Conference 20	2	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	3,300	4	None	Yes	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	2,277	0.0	113	0	$14	$116	$20	6.9
Conference CST	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	1,074	0	$133	$562	$115	3.4
Corridor - 1978	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 - 1978	27	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	3, 5	Relamp	Yes	27	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	1.4	9,624	-2	$1,192	$3,097	$1,485	1.4
Corridor - 1992	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - 1992	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,380	3, 5	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.5	3,035	-1	$376	$1,223	$675	1.5
Corridor - CST Exit	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,380	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,380	0.0	77	0	$10	$33	$6	2.8
Corridor - Main	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor - Main	14	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	4,380	5	None	Yes	14	LED - Fixtures: Ambient 2x4 Fixture	High/Low Control	50	3,022	0.2	1,046	0	$130	$675	$490	1.4
Corridor - Main	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	3, 5	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.7	4,990	-1	$618	$1,697	$770	1.5
Corridor 1921 Downstairs	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Corridor 1921 Downstairs	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	3, 5	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.5	3,208	-1	$397	$1,107	$495	1.5
Corridor Gym Boys	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor Gym Boys	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	3, 5	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.2	1,069	0	$132	$444	$165	2.1
Corridor Gym Girls	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor Gym Girls	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	3, 5	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.4	2,495	-1	$309	$961	$385	1.9
Electrical Room 1921 Downstairs	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	600	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	600	0.1	74	0	$9	$146	$40	11.6
Electrical Room 1970	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	720	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	720	0.0	44	0	$5	$73	$20	9.7
Gymnasium	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
Gymnasium	24	Linear Fluorescent - T5HO: 4' T5HO (54W) - 6L	Wall Switch	S	358	3,300	3, 4	Relamp	Yes	24	LED - Linear Tubes: (6) 4' T5HO (25W) Lamps	Occupancy Sensor	153	2,277	4.4	21,992	-5	$2,725	$3,520	$790	1.0
Janitorial 1921 Downstairs	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	600	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	600	0.0	37	0	$5	$73	$20	11.6
Janitorial 2nd Grade	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	720		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	720	0.0	0	0	$0	$0	$0	0.0
Janitorial 2nd Grade	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	S	9	720		None	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	720	0.0	0	0	$0	$0	$0	0.0
Janitorial 3rd Grade	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	720		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	720	0.0	0	0	$0	$0	$0	0.0
Janitorial Boys Gym	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	600	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	600	0.0	22	0	$3	$37	$10	9.8
Janitorial Girls Gym	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	720	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	720	0.0	26	0	$3	$37	$10	8.2
Janitorial Kindergarten	1	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	720		None	No	1	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	720	0.0	0	0	$0	$0	$0	0.0
Janitorial Kindergarten	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	720		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	720	0.0	0	0	$0	$0	$0	0.0
Kitchen	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.8	4,115	-1	$510	$1,526	$340	2.3
Library	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
Library	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	915	0	$113	$219	$60	1.4
Library	21	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	21	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	1.1	5,639	-1	$699	$2,074	$490	2.3
Library Copy Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	762	0	$94	$453	$85	3.9
Lobby CST	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	3, 5	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.2	1,069	0	$132	$444	$165	2.1
Lounge 30	6	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	3,300	4	None	Yes	6	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	2,277	0.1	338	0	$42	$270	$35	5.6
Lounge 30	2	LED - Fixtures: Ceiling Mount	Wall Switch	S	10	3,300	4	None	Yes	2	LED - Fixtures: Ceiling Mount	Occupancy Sensor	10	2,277	0.0	23	0	$3	$116	$20	34.4

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Lounge 30	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,300	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	3,300	0.0	64	0	$8	$18	$5	1.7
Main Lobby	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
Main Lobby	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,380	3, 5	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	3,022	0.2	1,134	0	$141	$660	$270	2.8
Main Office - 17	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	1,074	0	$133	$562	$115	3.4
Main Office - Copy Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	$15	$37	$10	1.8
Maintenance Shop	1	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	S	12	3,300		None	No	1	LED Lamps: (1) 12W A19 Screw-In Lamp	Wall Switch	12	3,300	0.0	0	0	$0	$0	$0	0.0
Maintenance Shop	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	3,300	4	None	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,277	0.0	33	0	$4	$116	$0	28.7
Maintenance Shop	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	3,300		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	0	0	$0	$0	$0	0.0
Maintenance Shop	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	S	9	3,300		None	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	3,300	0.0	0	0	$0	$0	$0	0.0
Maintenance Shop	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	$15	$37	$10	1.8
Mechanical - Boiler Room 1921	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	720	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	497	0.1	67	0	$8	$189	$40	18.1
Mechanical - Boiler Room 1965	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	720	4	None	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	497	0.0	11	0	$1	$270	$35	177.6
Mechanical - Boiler Room 1965	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	720	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	497	0.1	67	0	$8	$189	$40	18.1
Mechanical - Chiller Pumps	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	720	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	497	0.0	35	0	$4	$153	$30	28.4
Mechanical Elevator	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	600	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	600	0.0	44	0	$5	$73	$20	9.8
Mechanical Sprinkler	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	720	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	720	0.0	26	0	$3	$37	$10	8.2
Office - Counselor 6	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.3	1,611	0	$200	$708	$155	2.8
Office - CST Director	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	1,074	0	$133	$562	$115	3.4
Office - CST LDTC	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	806	0	$100	$489	$95	3.9
Office - CST Main	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	806	0	$100	$489	$95	3.9
Office - CST Psychologist	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	806	0	$100	$489	$95	3.9
Office - CST Social Worker	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	806	0	$100	$489	$95	3.9
Office - Gym	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	305	0	$38	$189	$40	3.9
Office - Kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	305	0	$38	$189	$40	3.9
Office - Nurse 14	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,300	0.0	120	0	$15	$37	$10	1.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office - Nurse 14	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.4	2,148	0	$266	$854	$195	2.5
Office - Security 16	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.2	915	0	$113	$489	$95	3.5
Office - Tech	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	2,300	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,300	0.1	283	0	$35	$146	$40	3.0
Office 18	2	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	50	3,300	4	None	Yes	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	2,277	0.0	113	0	$14	$116	$20	6.9
Office 18	2	LED - Fixtures: Ceiling Mount	Wall Switch	S	10	3,300	4	None	Yes	2	LED - Fixtures: Ceiling Mount	Occupancy Sensor	10	2,277	0.0	23	0	$3	$116	$20	34.4
Office 24	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	$57	$380	$65	5.6
Principals Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.3	1,611	0	$200	$708	$155	2.8
Restroom - 1921	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	2,300	3	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,300	0.0	73	0	$9	$72	$10	6.9
Restroom - CST Conference	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	2,300	3	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,300	0.0	73	0	$9	$72	$10	6.9
Restroom - Faculty Lounge 30 #1	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,300		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	0	0	$0	$0	$0	0.0
Restroom - Faculty Main Office	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	40	3,300	4	None	Yes	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,277	0.0	90	0	$11	$116	$0	10.4
Restroom - Female 2nd Grade	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	$57	$226	$30	3.5
Restroom - Female 3rd Grade	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	$57	$226	$30	3.5
Restroom - Female 4th Grade	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.1	537	0	$67	$262	$40	3.3
Restroom - Female Cafeteria	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	$57	$226	$30	3.5
Restroom - Female Gym	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	806	0	$100	$489	$95	3.9
Restroom - Female Kindergarten	5	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	40	3,300	4	None	Yes	5	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,277	0.0	225	0	$28	$270	$35	8.4
Restroom - Lounge 30 #2	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	S	17	3,300		None	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,300	0.0	0	0	$0	$0	$0	0.0
Restroom - Male 2nd Grade	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,277	0.1	457	0	$57	$226	$30	3.5
Restroom - Male 3rd Grade	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	$57	$226	$30	3.5
Restroom - Male 4th Grade	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.1	537	0	$67	$262	$40	3.3
Restroom - Male Cafeteria	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,300	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,277	0.1	457	0	$57	$226	$30	3.5
Restroom - Male Gym	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,300	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,277	0.2	806	0	$100	$335	$60	2.8
Restroom - Male Kindergarten	5	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	40	3,300	4	None	Yes	5	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	40	2,277	0.0	225	0	$28	$270	$35	8.4
Stage	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Stage	7	Incandescent: (1) 100W A19 Screw-In Lamp	Wall Switch	S	100	720	3, 4	Relamp	Yes	7	LED Lamps: A19 Lamps	Occupancy Sensor	15	497	0.5	497	0	$62	$391	$42	5.7
Stage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	720	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	720	0.0	26	0	$3	$37	$10	8.2
Stairs 1	2	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch		50	4,380	4	None	Yes	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	50	3,022	0.0	149	0	$19	$116	$0	6.3
Stairs 2	1	Compact Fluorescent: (1) 26W Double Biaxial Plug-In Lamp	Wall Switch		26	4,380	3, 5	Relamp	Yes	1	LED Lamps: GX23 (Plug-In) Lamps	High/Low Control	19	3,022	0.0	62	0	$8	$13	$1	1.5
Stairs 2	3	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Wall Switch		42	4,380	3, 5	Relamp	Yes	3	LED Lamps: PL-L (Biax) Lamps	High/Low Control	30	3,022	0.0	308	0	$38	$266	$108	4.1
Stairs 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	4,380	3, 5	Relamp	Yes	1	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,022	0.0	106	0	$13	$18	$5	1.0
Storage - 2nd Grade	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	720	3, 4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	497	0.1	70	0	$9	$343	$20	37.4
Storage - Cafeteria	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	720	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	497	0.2	234	0	$29	$562	$115	15.4
Storage - Kitchen	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	720	3, 4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	497	0.1	70	0	$9	$343	$20	37.4
Storage - Stage	1	Compact Fluorescent: (1) 26W Double Biaxial Plug-In Lamp	Wall Switch	S	26	720	3	Relamp	No	1	LED Lamps: GX23 (Plug-In) Lamps	Wall Switch	19	720	0.0	6	0	$1	$13	$1	16.7
Storage 1921 Downstairs	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	720	4	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	497	0.0	28	0	$4	$116	$0	32.9
Storage 51	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	720	3, 4	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	497	0.3	299	0	$37	$599	$125	12.8
Storage Gym Hall	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	720	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	497	0.1	133	0	$16	$416	$40	22.8
Corridor 2nd Floor - 4th Grade	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,380	3, 5	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,022	0.4	2,851	-1	$353	$1,034	$440	1.7
Exterior	4	Compact Fluorescent: (1) 26W Double Biaxial Plug-In Lamp	Timeclock		26	4,380	3	Relamp	No	4	LED Lamps: GX23 (Plug-In) Lamps	Timeclock	19	4,380	0.0	123	0	$16	$50	$4	3.0
Exterior	5	LED - Fixtures: Ceiling Mount	Timeclock		40	4,380		None	No	5	LED - Fixtures: Ceiling Mount	Timeclock	40	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior	3	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock		100	4,380		None	No	3	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	100	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior	46	LED - Fixtures: Wall Pack	Timeclock		40	4,380		None	No	46	LED - Fixtures: Wall Pack	Timeclock	40	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior - Courtyard	3	Metal Halide: (1) 70W Lamp	Timeclock		95	4,380	1	Fixture Replacement	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	21	4,380	0.0	972	0	$123	$618	$150	3.8
Garage	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	1,040	4	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	718	0.0	41	0	$5	$270	$35	46.1
Garage	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	1,040	2, 4	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	718	0.1	156	0	$19	$254	$40	11.1
Garage	3	Linear Fluorescent - T12: 4' T12 (40W) - 3L	Wall Switch	S	127	1,040	2, 4	Relamp & Reballast	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	718	0.2	333	0	$41	$563	$80	11.7
Garage	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	1,040	2, 4	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	718	0.2	248	0	$31	$373	$60	10.2

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Various Classrooms, offices, storages	Various Classrooms, offices, storages	51	Fan Coil Unit	0.3	60.0%	No			B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	AHU in 1921 Boiler room	2	Supply Fan	0.1	60.0%	No			W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Office 16	1	Supply Fan	2.0	86.5%	No	McQuay	OAH003FDAC	B	2,745	6	Yes	86.5%	No		0.0	0	0	$0	$670	$0	0.0
Roof	Gymnasium	1	Supply Fan	10.0	91.7%	No	LonMark	RPS025CLW	B	2,745	7	No	91.7%	Yes	1	2.9	8,374	0	$1,062	$6,697	$1,100	5.3
Roof	Gymnasium	1	Exhaust Fan	15.0	92.4%	No	LonMark	RPS025CLW	B	2,745	7	No	93.0%	Yes	1	4.5	12,611	0	$1,600	$9,177	$1,200	5.0
Roof	Boiler room	2	Fan Coil Unit	0.8	70.0%	No	Enviro Tech	VMR	B	2,745	6	Yes	80.0%	No		0.1	411	0	$52	$607	$0	11.6
Mechanical - Chiller Pumps	Chiller	2	Other	7.5	88.5%	Yes	WEG	CC029A	W	2,190		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Chiller Pumps	Chiller	2	Chilled Water Pump	25.0	91.7%	Yes	WEG	CC029A	W	2,190		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Boiler Room 1921	Boiler	1	Combustion Air Fan	0.3	70.0%	No	Century	C48H2DB5C11	W	1,880		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Boiler Room 1965	Boiler	2	Combustion Air Fan	0.8	70.0%	No	Century	C48K2DB5B2	W	1,880		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	All School - Various	27	Exhaust Fan	0.4	70.0%	No				2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Boiler Room 1921	Boiler	3	Heating Hot Water Pump	1.0	84.0%	No	Century		W	2,190	8	No	85.5%	Yes	3	0.3	2,257	0	$286	$10,523	$225	36.0
Mechanical - Boiler Room 1921	DHW	1	DHW Circulation Pump	0.2	60.0%	No	Taco		W	5,110		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Boiler Room 1965	DHW	3	DHW Circulation Pump	0.8	70.0%	No			W	8,760		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Boiler Room 1965	Boiler	2	Heating Hot Water Pump	3.0	78.5%	No	US Motors	G156A	W	2,190	8	No	89.5%	Yes	2	0.9	5,719	0	$726	$9,110	$400	12.0
Mechanical - Boiler Room 1965	Boiler	2	Heating Hot Water Pump	3.0	89.5%	No	US Motors	R332	W	2,190	8	No	89.5%	Yes	2	0.6	4,107	0	$521	$9,110	$400	16.7
Mechanical - Boiler Room 1965	Boiler	2	Heating Hot Water Pump	3.0	86.5%	No	Marathon	182TTDB4026BR	W	2,190	8	No	89.5%	Yes	2	0.7	4,506	0	$572	$9,110	$400	15.2
Roof	Kitchen Hood Exhaust Fan	1	Kitchen Hood Exhaust Fan	1.0	84.0%	No	Greenheck		W	1,920	9	No	85.5%	Yes	1	0.0	2,389	65	$1,231	$3,508	$75	2.8
Roof	Kitchen Hood Exhaust Fan	1	Kitchen Hood Exhaust Fan	1.0	84.0%	No	Greenheck		W	1,920	9	No	85.5%	Yes	1	0.0	2,389	65	$1,231	$3,508	$75	2.8
Elevator room	Elevator	1	Other	25.0	75.5%	No	US motors		W	200		No	75.5%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical - Boiler Room 1921	Sewer plant	2	Process Pump	2.0	86.0%	No			W	2,745		No	86.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical - Chiller Pumps	Sewer plant	1	Process Pump	0.3	53.0%	No	Neptune		W	2,745		No	53.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	Sewer plant	8	Process Pump	0.5	70.0%	No			W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Nurse	1	Supply Fan	0.2	60.0%	No	Lennox	HS29-024-3P	B	2,745	6	Yes	60.0%	No		0.0	0	0	$0	$443	$0	0.0
Roof	Main office conference	1	Supply Fan	0.2	60.0%	No	Lennox	HS29-018-3P	B	2,745	6	Yes	60.0%	No		0.0	0	0	$0	$443	$0	0.0
Roof	Main office	1	Supply Fan	0.2	60.0%	No	Lennox	HS29-018-3P	B	2,745	6	Yes	60.0%	No		0.0	0	0	$0	$443	$0	0.0
Garage	Garage	3	Other	0.3	60.0%	No			W	200		No	60.0%	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
Teachers lounge	Teachers lounge	1	Split-System	2.50		10.30		Sanyo	C3082	B	10	Yes	1	Split-System	2.50		16.00		0.5	872	0	$111	$4,634	$263	39.5
Room 16	Room 16	1	Split-System	1.50		9.80		Unknown	Unknown	B	10	Yes	1	Split-System	1.50		16.00		0.4	598	0	$76	$3,734	$158	47.1
Office tech	Office tech	1	Split-System	1.50		9.80		EMI	Unknown	B	10	Yes	1	Split-System	1.50		16.00		0.4	598	0	$76	$3,734	$158	47.1
Conference 20	Conference 20	1	Split-System	1.50		9.80		EMI	Unknown	B	10	Yes	1	Split-System	1.50		16.00		0.4	598	0	$76	$3,734	$158	47.1
Maintenance Shop	Maintenance Shop	1	Electric Resistance Heat		17.32		1 COP	Qmark		W		No							0.0	0	0	$0	$0	$0	0.0
Storage 1921 Downstairs	Storage 1921 Downstairs	1	Electric Resistance Heat		17.32		1 COP	Dayton	3UF81	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Nurse	1	Split-System	2.00		10.00		Lennox	HS29-024-3P	B	10	Yes	1	Split-System	2.00		16.00		0.5	756	0	$96	$4,040	$210	39.9
Roof	Main office conference	1	Split-System	1.50		10.00		Lennox	HS29-018-3P	B	10	Yes	1	Split-System	1.50		16.00		0.3	567	0	$72	$3,734	$158	49.7
Roof	Main office	1	Split-System	1.50		10.00		Lennox	HS29-018-3P	B	10	Yes	1	Split-System	1.50		16.00		0.3	567	0	$72	$3,734	$158	49.7
Roof	AHU in 1921 Boiler room	2	Split-System	1.00		9.80		EMI	SCC12DM0000AA 0A	B	10	Yes	2	Split-System	1.00		16.00		0.5	797	0	$101	$6,855	$210	65.7
Maintenance Shop	Maintenance Shop	1	Split-System	1.50		9.80		EMI	Unknown	B	10	Yes	1	Split-System	1.50		16.00		0.4	0	0	$0	$3,734	$158	0.0
Roof	Gymnasium	1	Package Unit	25.00	1,229.24	10.00		McQuay - LonMark	RPS025CLW	B	10	Yes	1	Package Unit	25.00	1,229.24	12.50		3.0	5,040	0	$639	$36,054	$2,125	53.1
Roof	Office 16	1	Package Unit	3.00				McQuay	OAH003FDAC	W		No							0.0	0	0	$0	$0	$0	0.0
Office 18	Office 18	1	Split-System	1.50		9.80		Unknown	Unknown	B	10	Yes	1	Split-System	1.50		16.00		0.4	598	0	$76	$3,734	$158	47.1
Lounge 30	Lounge 30	1	Split-System	2.50		9.80		Sanyo	KS3082	B	10	Yes	1	Split-System	2.50		16.00		0.6	996	0	$126	$4,634	$263	34.6

Electric Chiller Inventory & Recommendations

		Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Exterior	All school	1	Air-Cooled Scroll Chiller	156.00	York	YLAA0156HE46XF BSD	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	1965 section	2	Non-Condensing Hot Water Boiler	1,984	Weil Mclain	88	B	11	Yes	2	Condensing Hot Water Boiler	1,984	93.00%	Et	0.0	0	247	$3,506	$129,058	$8,730	34.3
Mechanical	1921 Section	1	Non-Condensing Hot Water Boiler	422	Burnham	4FW.63A.50.G0.G P	B	11	Yes	1	Condensing Hot Water Boiler	422	91.00%	Et	0.0	0	30	$429	$16,197	$1,000	35.4

Demand Control Ventilation Recommendations

		Recommendation Inputs					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Number of Zones	Cooling Capacity of Controlled System (Tons)	Electric Heating Capacity of Controlled System (kBtu/hr)	Output Heating Capacity of Controlled System (MBh)	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	Gymnasium	12	1.00	25.00	1.00	2,458.49	0.0	1,047	125	$1,903	$1,359	$0	0.7

Pipe Insulation Recommendations

		Recommendation Inputs			Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Boiler room	DHW	13	6	1.50	0.0	0	4	$55	$80	$12	1.2

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Manufacturer	Model	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Boiler room	Various	1	Boiler	AO Smith	HW 420 893	B	14	Yes	1	Condensing Boiler	Natural Gas	91.00%	Et	0.0	0	21	$300	$30,185	$0	100.5

Low-Flow Device Recommendations

	Recommendation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	15	16	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	8	$108	$115	$57	0.5

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Manufacturer	Model	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)	Trenton	TEHA008E6-R52B-B	16, 17	Yes	No	Yes	0.1	1,224	0	$155	$2,281	$155	13.7
Kitchen	1	Medium Temp Freezer (0F to 30F)	Trenton	TEHA025L6-HT3B-F	16, 17	Yes	Yes	Yes	0.1	2,609	0	$331	$2,799	$205	7.8

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	Jack and Jill		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Refrigerator Chest	Powers		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	QBD	DC7H	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	True	T-49	No		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	Manufacturer	Model	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Ice Making Head (<450 lbs/day), Batch	Manitowoc	SY0424A	Yes		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	Electric Convection Oven (Full Size)	Garland		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Griddle (3 Feet Width)	Imperial		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	FEW		No		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	Single Tank Conveyor (High Temp)	Hobart	CL44EN	Natural Gas	Electric	No		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
Indian Mills ES	1	Clothes Dryer	1,200	No		
Indian Mills ES	1	Clothes Washer	900	No		
Indian Mills ES	5	Coffee Machine	400	No		
Indian Mills ES	85	Desktop	145	No		
Indian Mills ES	35	Fan Ceiling	70	No		
Indian Mills ES	1	Kiln	8,320	No		
Indian Mills ES	7	Microwave	900	No		
Indian Mills ES	1	Air Purifier	900	No		
Indian Mills ES	3	Paper Shredder	200	No		
Indian Mills ES	15	Printer (Medium)	80	No		
Indian Mills ES	4	Printer (Copier)	220	No		
Indian Mills ES	3	Refrigerator (Mini)	80	No		
Indian Mills ES	3	Refrigerator (Residential)	200	No		
Indian Mills ES	1	Serving table (chilled/heated)	1,500	No		
Indian Mills ES	37	Smart Board	5	No		
Indian Mills ES	2	Television	120	No		
Indian Mills ES	1	Toaster	900	No		
Indian Mills ES	2	Toaster Oven	1,200	No		
Indian Mills ES	11	Water fountain	500	No		
Indian Mills ES Garage	3	Power tools	1,000	No		

APPENDIX B: ENERGY STAR STATEMENT OF ENERGY PERFORMANCE

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

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ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Indian Mills Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 73,895
Built: 1965

For Year Ending: September 30, 2022
Date Generated: August 07, 2023

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Indian Mills Elementary School 112 Indian Mills Road Shamong, New Jersey 08088	________________ , (____)____-______	____ ________ , (____)____-______ ________________

Property ID: 25788924

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
72.2 kBtu/ft²

Source EUI
132 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,621,268 (49%)
Electric - Solar (kBtu)	331,788 (6%)
Electric - Grid (kBtu)	2,381,480 (45%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	60.9
National Median Source EUI (kBtu/ft²)	111.3
% Diff from National Median Source EUI	18%

Annual Emissions

Total (Location-Based) GHG Emissions (Metric Tons CO2e/year)	347

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.