Local Government Energy Audit Report

Shore Regional High School

April 14, 2025

Prepared for:
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West Long Branch, New Jersey 07764

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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 the utility-run Prescriptive and Custom Rebate program at the beginning of the fiscal year. Incentive levels are not guaranteed. Please review all available utility program incentives and eligibility requirements prior to selecting and installing any energy conservation measures. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice.

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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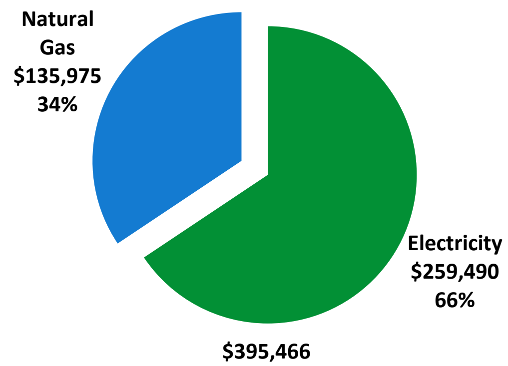
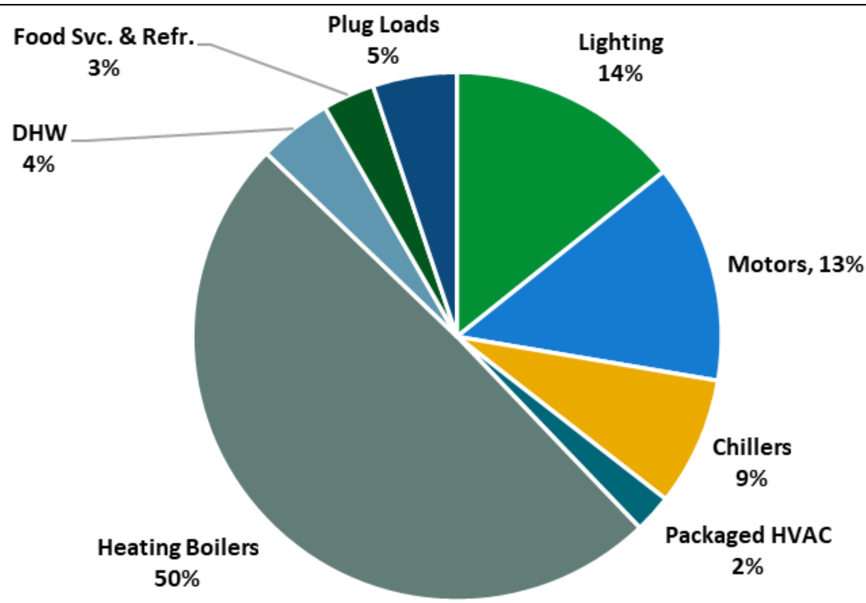
1 Executive Summary

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

BUILDING PERFORMANCE REPORT

Annual Energy Utilities	Costs: $395,466 Electricity: 1,973,513 kWh Natural Gas: 90,371 Therms Water: 3,943,014 Gallons	
ENERGY STAR® Benchmarking Score	20 *(1-100 scale)*	This building performs below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.



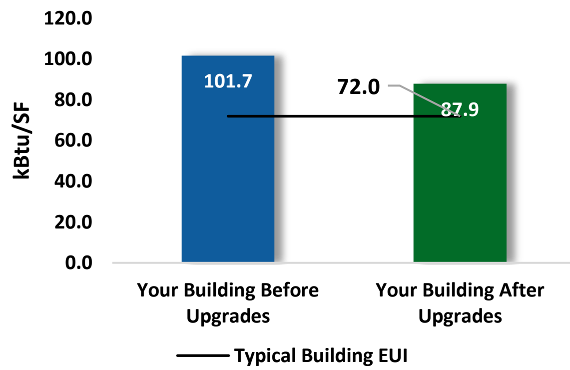
Energy Use by System

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.

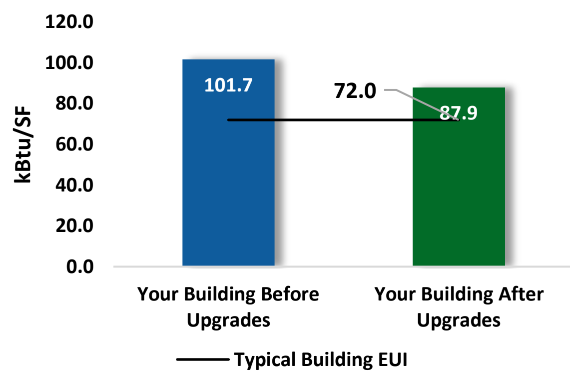
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$339,570
Potential Rebates & Incentives[1]	$78,110
Annual Cost Savings	$70,931
Annual Energy Savings	Electricity: 482,767 kWh Natural Gas: 4,954 Therms
Greenhouse Gas Emission Savings	272 Tons
Simple Payback	3.7 Years
Site Energy Savings (All Utilities)	14%



Scenario 2: Cost Effective Package[2]

Installation Cost	$336,650
Potential Rebates & Incentives	$77,810
Annual Cost Savings	$70,823
Annual Energy Savings	Electricity: 481,947 kWh Natural Gas: 4,954 Therms
Greenhouse Gas Emission Savings	272 Tons
Simple Payback	3.7 Years
Site Energy Savings (all utilities)	14%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] All incentives are estimated from the utility-run Prescriptive and Custom Rebate program at the beginning of the fiscal year. Always contact your utility provider for details on all current programs.

[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			**375,426**	**43.8**	**-60**	**$48,461**	**$150,420**	**$23,630**	**$126,790**	**2.6**	**371,032**
ECM 1	Install LED Fixtures	Yes	20,000	0.0	0	$2,630	$30,330	$200	$30,130	11.5	20,140
ECM 2	Retrofit Fixtures with LED Lamps	Yes	355,426	43.8	-60	$45,832	$120,090	$23,430	$96,660	2.1	350,893
Lighting Control Measures			**78,316**	**12.0**	**-16**	**$10,051**	**$65,150**	**$47,950**	**$17,200**	**1.7**	**76,946**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	72,780	11.1	-15	$9,341	$54,160	$39,230	$14,930	1.6	71,507
ECM 4	Install High/Low Lighting Controls	Yes	5,535	0.8	-1	$710	$10,990	$8,720	$2,270	3.2	5,438
Variable Frequency Drive (VFD) Measures			**56,872**	**4.8**	**104**	**$9,047**	**$102,800**	**$5,700**	**$97,100**	**10.7**	**69,478**
ECM 5	Install VFDs on Heating Water Pumps	Yes	48,904	4.8	0	$6,430	$62,400	$3,200	$59,200	9.2	49,246
ECM 6	Install VFDs on Kitchen Hood Fan Motors	Yes	7,967	0.0	104	$2,617	$40,400	$2,500	$37,900	14.5	20,232
Unitary HVAC Measures			**1,400**	**0.5**	**0**	**$184**	**$2,000**	**$0**	**$2,000**	**10.9**	**1,410**
ECM 7	Install High Efficiency Air Conditioning Units	Yes	1,400	0.5	0	$184	$2,000	$0	$2,000	10.9	1,410
HVAC System Improvements			**0**	**0.0**	**32**	**$477**	**$560**	**$80**	**$480**	**1.0**	**3,710**
ECM 8	Install Pipe Insulation	Yes	0	0.0	32	$477	$560	$80	$480	1.0	3,710
Domestic Water Heating Upgrade			**0**	**0.0**	**86**	**$1,290**	**$6,510**	**$150**	**$6,360**	**4.9**	**10,040**
ECM 9	Install Low-Flow DHW Devices	Yes	0	0.0	86	$1,290	$6,510	$150	$6,360	4.9	10,040
Food Service & Refrigeration Measures			**3,580**	**0.4**	**0**	**$471**	**$3,730**	**$600**	**$3,130**	**6.6**	**3,605**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	No	820	0.1	0	$108	$2,920	$300	$2,620	24.3	826
ECM 11	Vending Machine Control	Yes	2,760	0.3	0	$363	$810	$300	$510	1.4	2,780
Custom Measures			**-32,826**	**0.0**	**350**	**$950**	**$8,400**	**$0**	**$8,400**	**8.8**	**7,925**
ECM 12	Replace Fossil Fuel Water Heater with Heat Pump Water Heater	Yes	-32,826	0.0	350	$950	$8,400	$0	$8,400	8.8	7,925
TOTALS (COST EFFECTIVE MEASURES)			**481,947**	**61.4**	**495**	**$70,823**	**$336,650**	**$77,810**	**$258,840**	**3.7**	**543,321**
TOTALS (ALL MEASURES)			**482,767**	**61.5**	**495**	**$70,931**	**$339,570**	**$78,110**	**$261,460**	**3.7**	**544,146**

* - All incentives presented in this table are estimated from the utility run Prescriptive and Custom Rebate program at the beginning of the fiscal year. Always contact your utility provider for details on all current programs.

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

All Evaluated Energy Improvements[3]

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

[3] 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 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.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decision 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. To qualify for the program, sites must have an average annual demand above 200 kW.

Energy Management

The Energy Management program provides the organizational tools, systems, and processes necessary for achieving continuous energy performance improvement. The program is made up of different pathways. These subprograms offer a comprehensive mix of custom energy savings measures such as basic HVAC tune-ups, building systems tune-ups, controls' calibration, diagnostic testing, and installation of measures to enhance a building's energy performance and savings. To qualify for the program, sites must have an average annual demand above 200 kW.

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 for the largest energy consumers in the state. Customers in this category spend about $5 million a year on energy bills. This program 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 Shore Regional High School. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs.

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

2.1 Site Overview

On December 26, 2024, TRC performed an energy audit at Shore Regional High School located in West Long Branch, New Jersey. TRC met with Kelly Boehler to review the facility operations and help focus our investigation on specific energy-using systems.

Shore Regional High School is a 1-story, 155,000 square foot building built in 1961. Spaces include classrooms, gymnasium, auditorium, offices, cafeteria, corridors, stairwells, mechanical spaces, and storage rooms.

Recent Improvements and Facility Concerns

The facility upgraded the roof in the summer of 2024. The make-up air units were installed in 2022. The linear fluorescent tubes are being replaced with LED sources as they fail. Facility concerns include high energy bills.

2.2 Building Occupancy

The school operates on a weekday schedule for ten months with some weekend use throughout the entire year. Maintenance is performed after school hours and as needed.

Building Name	Weekday/Weekend	Operating Schedule
Shore Regional HS (10 Months)	Weekday	7:00 AM - 10:00 PM
	Weekend	N/A
Shore Regional HS (12 Months)	Weekday	N/A
	Weekend	8:30 AM - 4:00 PM

Building Occupancy Schedule

2.3 Building Envelope

Building walls are brick and are in fair condition. The windows are double pane, operable, have metal frames and are in fair condition. They are caulked and sealed. The roof is pitched with metal decking and is in good condition. The roof is insulated. Building doors are metal and glass with metal frames and are in fair condition. They are properly weather stripped.

Exterior brick wall

Typical window

Exterior door

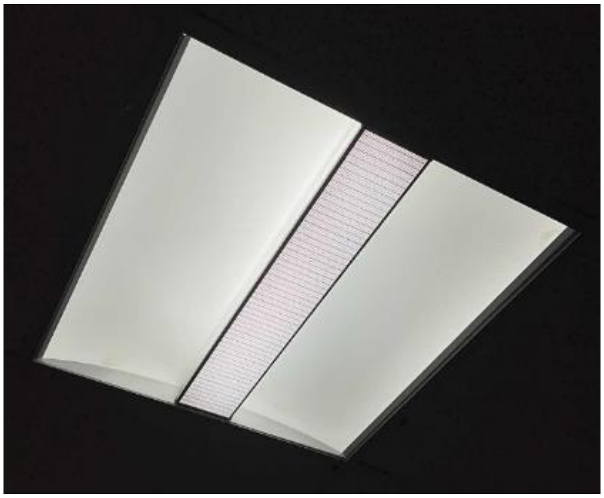
Metal decking roof

2.4 Lighting Systems

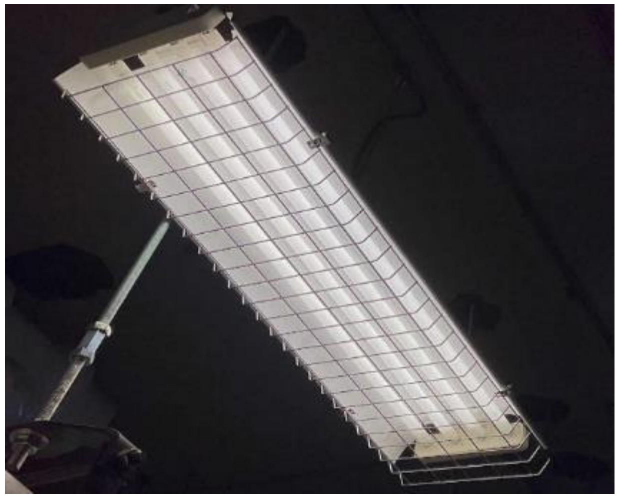
The primary interior lighting system uses a mix of linear fluorescent T8 and T5 lamps.

A few areas, including janitor's closets and the theater area use incandescent lamps. LED fixtures and lamps were noted in a few locations, including the kitchen and gymnasium scoreboard.

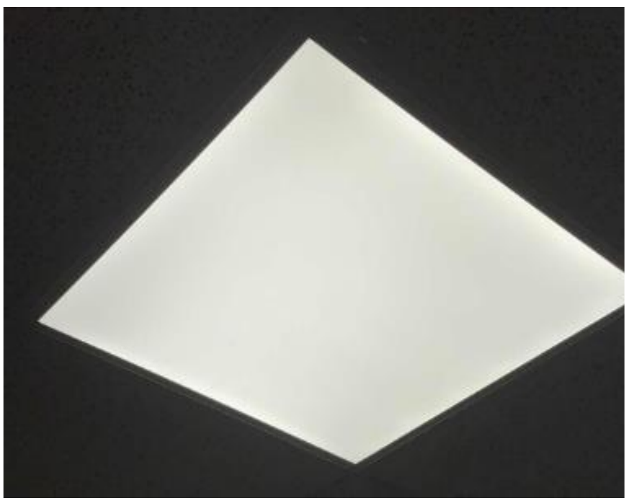
Interior lighting is controlled by wall switches. Most fixtures are in good condition. Interior lighting levels were generally sufficient.



Linear fluorescent T5s



Linear fluorescent T8s



LED fixture

LED exit sign

Exterior areas use a combination of compact fluorescent, LED lamps, LED fixtures, metal halide lamps, and mercury vapor lamps. Most fixtures are building mounted. Parking areas are illuminated by LED pole-mounted fixtures. Fixtures are controlled by timeclocks or manually by switches.

Metal halide lamp

LED fixture

2.5 Air Handling Systems

Fan Coil Units

Fan coil units (FCUs) provide heating and cooling to classrooms and various other areas. They are equipped with small constant speed supply fan motors and are connected to the hot water and chilled water distribution systems. These units are controlled by the BAS and are in good to fair condition.

Typical FCU

Unitary Electric HVAC Equipment

Some of the garage areas are cooled by through-the-wall air conditioning (AC) units. These have a capacity of 1 ton and an efficiency rating of 8 EER. They are in poor condition.

Additionally, there is one Mitsubishi ductless mini-split AC. This unit has a capacity of 3 tons and an efficiency rating of 10.8 EER. It is good condition.

Window AC

Ductless Mini-Split AC

Packaged Units

Certain areas of the building are served by package units controlled by the BAS, including:

Name	Cooling Capacity (Tons)	Efficiency (EER)	Heating Capacity (kBtu/hr)	Efficiency (AFUE)
MUA-1	3.00	12.00	48.00	0.80
MUA-2	3.00	12.00	48.00	0.80
MUA-3	3.00	12.00	48.00	0.80
MUA-4	3.00	12.00	48.00	0.80

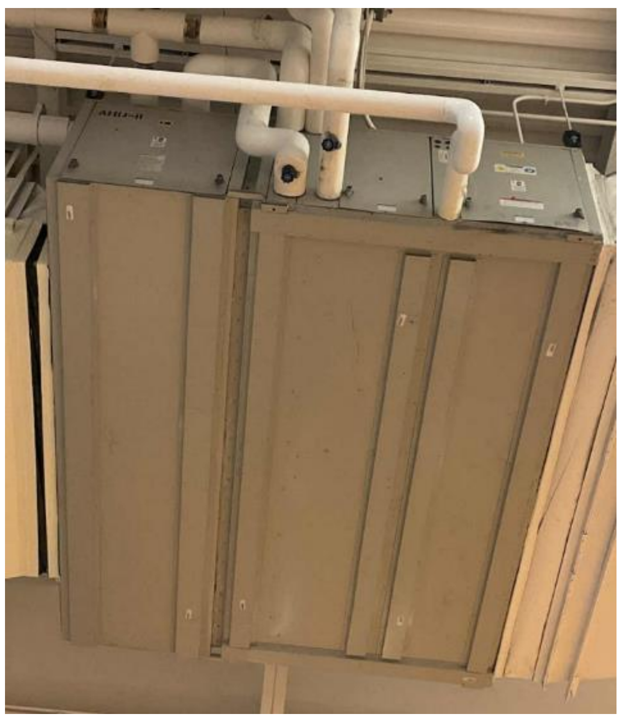
Refer to Appendix A for detailed information about each unit.

Make up air unit

Package unit

<u>Air Handling Units (AHUs)</u>

Various areas of the building are conditioned by air handling units. Each unit is equipped with a supply fan motor, a hot water heating coil, and a chilled water coil. Supply fan motors are assumed to be 2 hp, constant speed, and standard efficiency. The AHUs are connected to the BAS and are in good working condition.



Typical AHU

<u>Unitary Heating Equipment</u>

Some of the garage areas are heated by Dayton suspended gas fired furnaces. These each have a capacity of 30 kBtu/hr and are in fair condition. Equipment is controlled by a local thermostat.

Gas fired heater

2.6 Heating Hot Water Systems

Five condensing hot water boilers serve the building heating load. They are all a Mach 1,920 kBtu/hr units, each with a nominal efficiency rating of 96%.

This system includes two 25 hp constant speed heating hot water pumps that provide hot water to heating coils in the AHUs and the FCUs. They are connected to the BAS system to better control the buildings heating. The piping for these systems is insulated and in good condition.

Mach heating hot water boilers

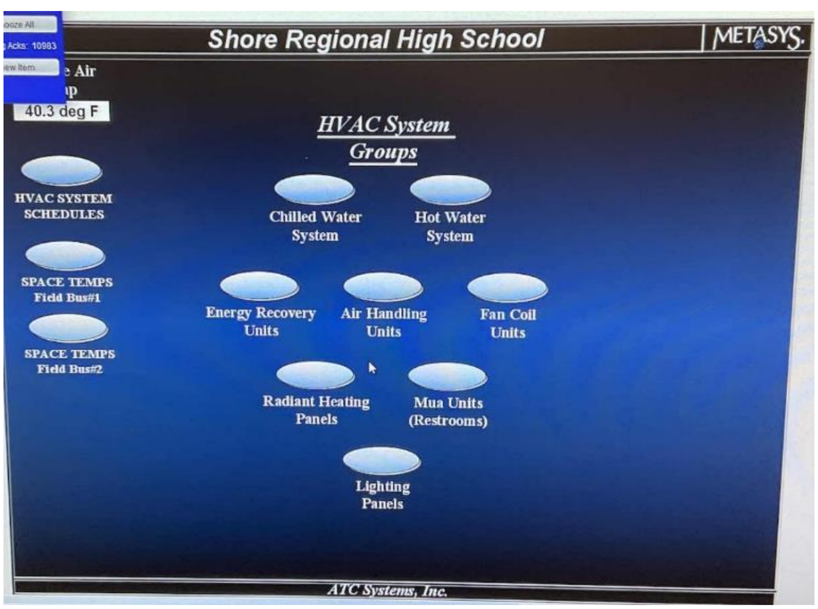
2.7 Chilled Water Systems

The chilled water system consists of a 250-ton variable speed Trane air-cooled scroll chiller. This system includes two variable speed 30 hp and two constant speed 20 hp chilled water pumps that provide chilled water to the AHUs and the FCUs. The system is controlled by a BAS. Chilled water supply temperature is reset based on outside air temperature and is turned off in the winter months. The system is reportedly in fair condition.

Trane air-cooled screw chiller

2.8 Building Automation System (BAS)

A Johnson Controls Metasys system BAS controls the HVAC equipment. The BAS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, heating water loop temperatures, and chilled water loop temperatures.



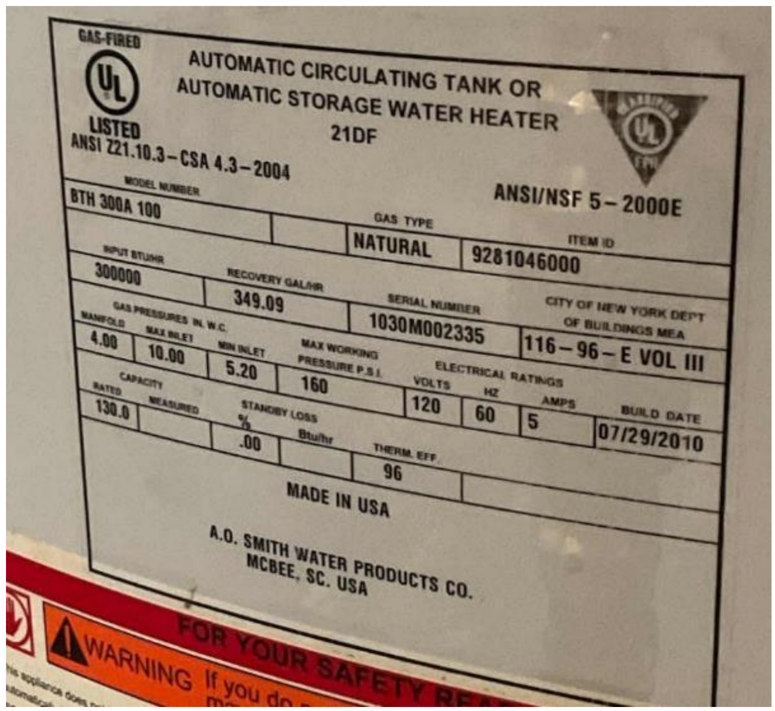
BAS system

2.9 Domestic Hot Water

Hot water is produced by various water heaters. These units include:

Location	Type of Unit	Input Capacity (kBtu/hr)	Tank Capacity (gallons)	Efficiency
Boiler Room	Natural Gas	365	85	80%
Boiler Room	Natural Gas	365	85	80%
Chiller Room	Natural Gas	300	130	96%
Chiller Room	Natural Gas	300	119	96%

Refer to Appendix A for detailed information about each unit. The domestic hot water pipes are not insulated.



Natural gas-powered storage tank water heater

2.10 Food Service Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare meals for students and staff. The cooking is done using gas fryers, a gas griddle, ovens, and stoves. Equipment is in good to fair condition.

One classroom has five electric residential stove/ovens, however, they are lightly used. There are multiple non-ENERGY STAR door type dishwashers. They are in good condition.

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

Stove/oven

Dishwasher

2.11 Refrigeration

The kitchen and two classrooms have stand-up refrigerators and freezers with a mix of solid and glass doors. These vary in capacity and condition from fair to good. A few are ENERGY STAR certified.

The kitchen also has a walk-in cooler and a walk in low temperature freezer. These are in fair condition. There are two commercial ice makers which are in good condition.

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

Stand-up refrigerators with glass doors

Walk-in cooler

2.12 Plug Load and Vending Machines

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

There are 175 computer workstations throughout the facility plus a number of laptop computers. Plug loads include general cafe and office equipment plus typical high school loads including a kiln and shop equipment. The site includes network equipment for data storage and transfer. There are two residential style refrigerators and two glass-fronted refrigerated and one non-refrigerated vending machines in good condition.

Residential refrigerator

Large printer/copier

2.13 Water-Using Systems

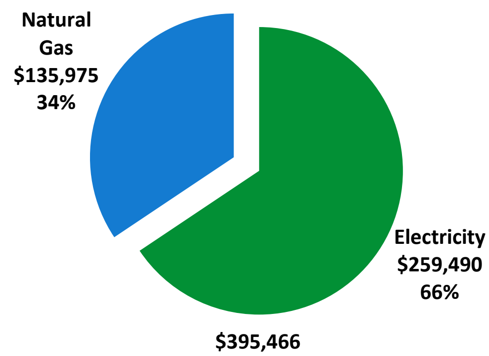
Potable water is used for drinking, cleaning, sanitary fixtures, and landscaping. EPA WaterSense® has set maximum flow rates for sanitary fixtures. They are: 1.28 gallons per flush (gpf) for toilets, 0.5 gpf for urinals, 1.5 gallons per minute (gpm) for lavatory faucets, and 2.0 gpm for showerheads.

Typical restroom sink

3 Energy and Water Use and Costs

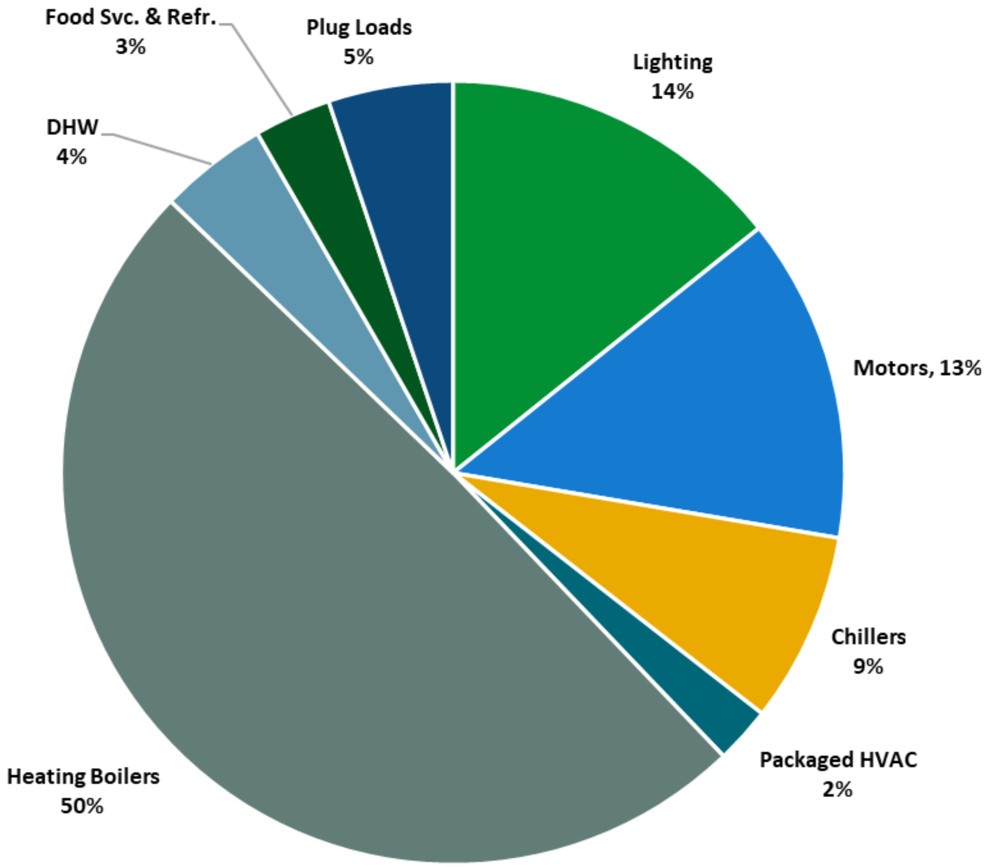
Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	1,973,513 kWh	$259,490
Natural Gas	90,371 Therms	$135,975
Total		**$395,466**



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.

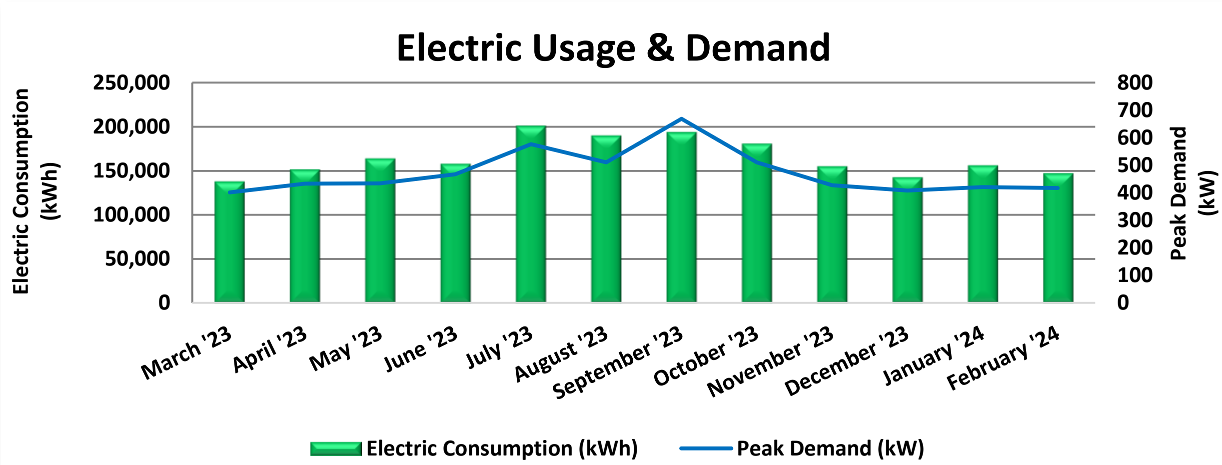
The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated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



Energy Balance by System

3.1 Electricity

JCP&L delivers electricity under rate class JC_GS3_01F. Electric production is provided by Direct Energy, a third-party supplier.



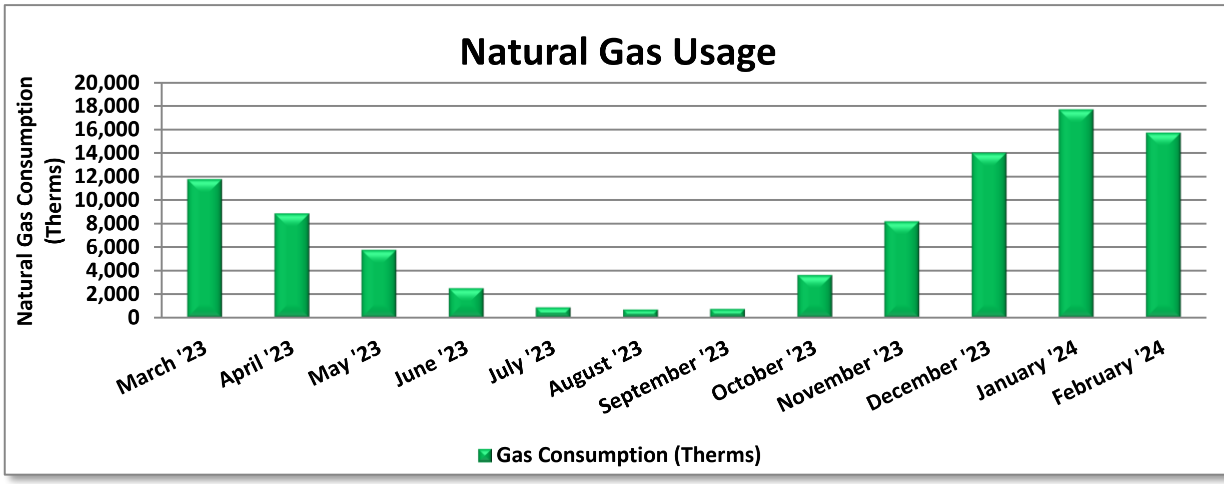
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
3/30/23	30	138,315	401	$2,574	$18,105
4/30/23	31	151,485	434	$3,108	$20,072
5/31/23	31	164,060	435	$3,147	$21,687
6/28/23	28	157,963	468	$3,274	$20,903
7/28/23	30	201,097	577	$4,137	$26,475
8/29/23	32	189,973	511	$3,619	$24,739
9/29/23	31	193,856	669	$4,787	$26,386
10/30/23	31	180,906	511	$3,624	$23,464
11/29/23	30	155,069	428	$3,012	$20,091
12/29/23	30	142,605	409	$2,869	$18,603
1/30/24	32	156,146	421	$2,723	$20,188
2/29/24	30	147,445	418	$2,938	$19,489
Totals	**366**	**1,978,920**	**669**	**$39,811**	**$260,201**
Annual	**365**	**1,973,513**	**669**	**$39,703**	**$259,490**

Notes:

- Peak demand of 669 kW occurred in September '23.
- Average demand over the past 12 months was 473 kW.
- The average electric cost over the past 12 months was $0.131/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

NJ Natural Gas delivers natural gas under rate class GSS and GSL. Natural gas supply is provided by Direct NRG, a third-party supplier.



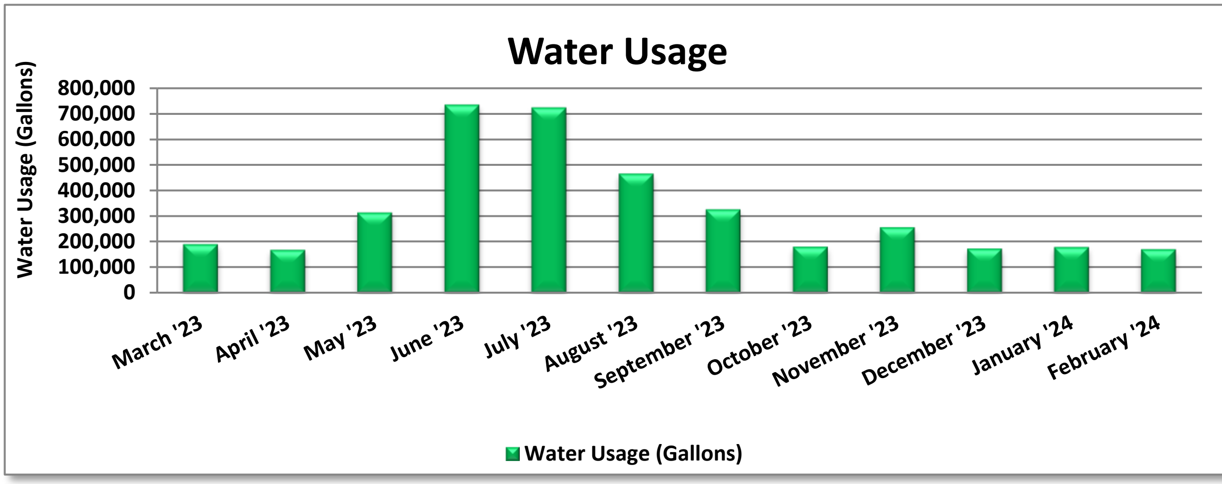
Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
3/16/23	28	11,759	$18,671
4/18/23	33	8,850	$12,780
5/16/23	28	5,746	$8,731
6/15/23	30	2,510	$5,056
7/20/23	35	881	$3,207
8/16/23	27	690	$2,978
9/14/23	29	737	$3,036
10/17/23	33	3,631	$6,467
11/13/23	27	8,176	$12,342
12/14/23	31	14,003	$19,270
1/18/24	35	17,679	$22,918
2/16/24	29	15,709	$20,519
Totals	**365**	**90,371**	**$135,975**
Annual	**365**	**90,371**	**$135,975**

Notes:

- The average gas cost for the past 12 months is $1.505/therm, which is the blended rate used throughout the analysis.

3.3 Water

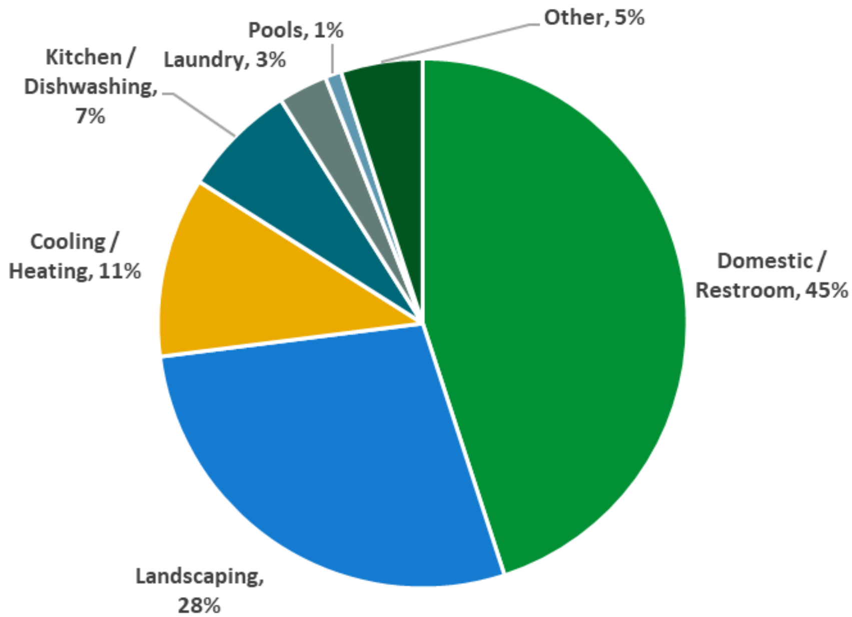
Twin Rivers Water delivers water to the project site.



Water Billing Data			
Period Ending	**Days in Period**	**Water Usage (gallons)**	**Water Cost**
4/5/23	29	191,000	$2,855
5/4/23	29	169,000	$2,762
6/6/23	33	314,000	$4,006
7/7/23	31	736,000	$11,638
8/4/23	28	724,000	$7,681
9/6/23	33	466,000	$13,102
10/5/23	29	327,000	$9,626
11/3/23	29	181,000	$3,014
12/5/23	32	257,000	$6,693
1/4/24	30	173,000	$2,949
2/1/24	28	180,000	$3,046
3/1/24	29	171,000	$6,011
Totals	**360**	**3,889,000**	**$73,382**
Annual	**365**	**3,943,014**	**$74,401**

Notes:

- The average cost of water for the past 12 months is $0.0189/gal.



Typical Education Water End Use[4]

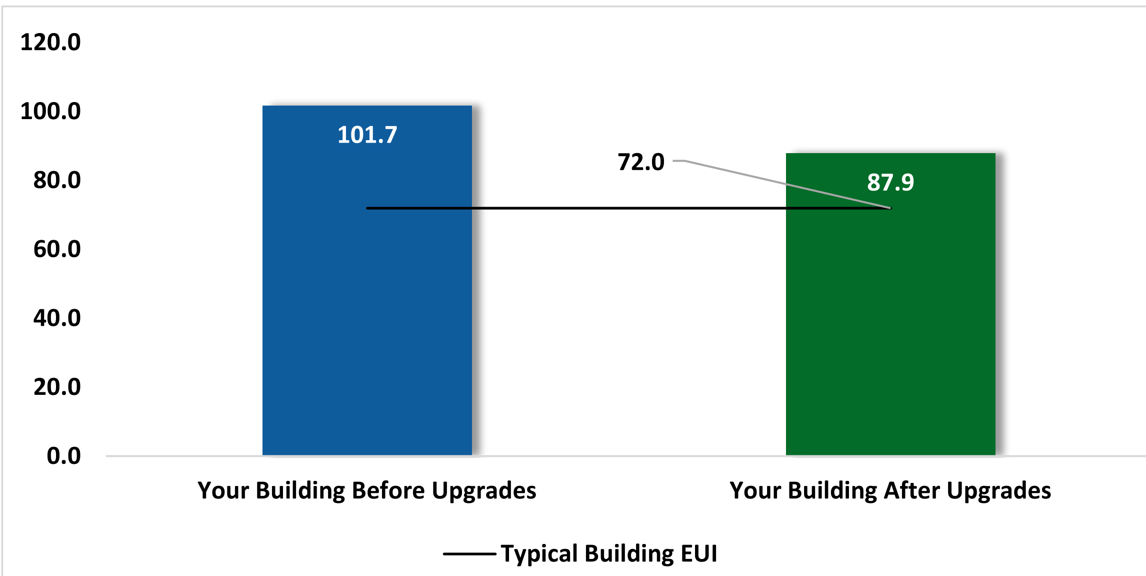
[4] Chart depicts typical water end use patterns and not specific to the facility.

3.4 Benchmarking

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

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

Benchmarking Score	20



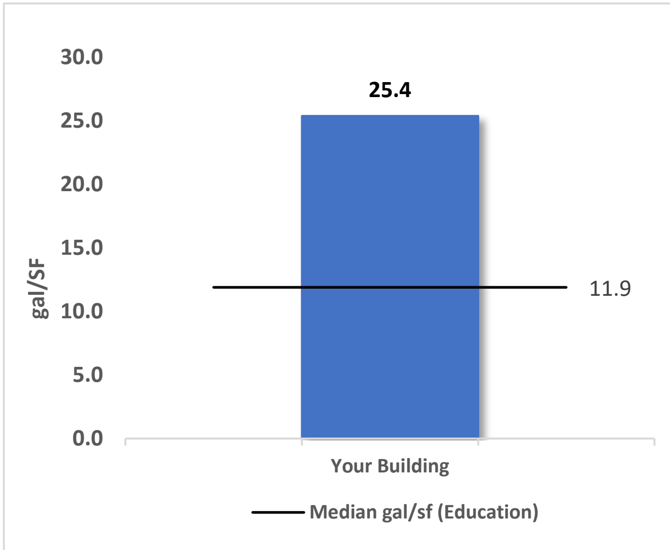
Energy Use Intensity Comparison[5]

This building performs 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.

[5] Based on all evaluated ECMs

Water Benchmarking



A benchmark is provided for your building's water use based on the annual water use in gallons per square foot of building area (gal/sf-yr). Your building is compared to other similar buildings based on average water usage as available from the 2012 Commercial Buildings Energy Consumption Survey (CBECS) and from the EPA ENERGY STAR DataTrends Water Use Tracking database.

Water use varies considerably depending mainly on the extent of outdoor water use and whether process water is used, such as for vehicle washing and for laboratory sterilizers. Cooling towers and steam boilers are also significant water users. Kitchens and sanitary fixtures may use varying amounts of water.

Tracking your Energy Performance

Keeping track of your energy and water use on a monthly basis is one of the best ways to keep utility costs in check and keep your facility operating efficiently. 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.

3.5 Understanding Your Utility Bills

The State of New Jersey Department of the Public Advocate provides detailed information on how to read natural gas and electric bills. Your bills contain important information including account numbers, meter numbers, rate schedules, meter readings, and the supply and delivery charges. Gas and electric bills both provide comparisons of current energy consumption with prior usage.

Sample bills, with annotation, may be viewed at:
https://www.nj.gov/rpa/docs/Understanding_Electric_Bill.pdf
https://www.nj.gov/rpa/docs/Understanding_Gas_Bill.pdf

Why Utility Bills Vary

Utility bills vary from one month to another for many reasons. For this reason, assessing the effects of your energy savings efforts can be difficult.

Billing periods vary, typically ranging between 28 and 33 days. Electric bills provide the kilowatt-hours (kWh) used per month while gas bills provide therms (or hundreds of cubic feet - CCF) per month consumption information. Monthly consumption information can be helpful as a tool to assess your efforts to reduce energy, particularly when compared to monthly usage from a similar calendar period in a prior year.

Bills typically vary seasonally, often with more gas consumed in the winter for heating, and more electricity used in the summer when air conditioning is used. Facilities with electric heating may experience higher electricity use in the winter. Seasonal variance will be impacted by the type of heating and cooling systems used. Normal seasonal fluctuations are further impacted by the weather. Extremely cold or hot weathers causes HVAC equipment to run longer, increasing usage. Other monthly fluctuations in usage can be caused by changes in building occupancy. Utility bills provide a comparison of usage between the current period and comparable billing month period of the prior year. Year-to-year monthly use comparisons can point to trends with energy savings for measures/projects that were implemented within the timeframe, but these comparisons do not account for changing weather of occupancy patterns.

The price of fuel and purchased power used to produce and delivery electricity and gas fluctuates. Any increase or decrease in these costs will be reflected in your monthly bill. Additionally, billing rates occasionally change after justification and approval of the NJBPU. For this reason, it is more useful to review energy use rather than cost when assessing energy use trends or the impact of energy conservation measures implemented.

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 estimated from the investor-owned utility run Prescriptive and Custom Rebate program at the beginning of the fiscal year. Some measures and proposed upgrades may be eligible for higher incentives than those shown. The incentives in the summary tables should be used for high-level planning purposes only. 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			**375,426**	**43.8**	**-60**	**$48,461**	**$150,420**	**$23,630**	**$126,790**	**2.6**	**371,032**
ECM 1	Install LED Fixtures	Yes	20,000	0.0	0	$2,630	$30,330	$200	$30,130	11.5	20,140
ECM 2	Retrofit Fixtures with LED Lamps	Yes	355,426	43.8	-60	$45,832	$120,090	$23,430	$96,660	2.1	350,893
Lighting Control Measures			**78,316**	**12.0**	**-16**	**$10,051**	**$65,150**	**$47,950**	**$17,200**	**1.7**	**76,946**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	72,780	11.1	-15	$9,341	$54,160	$39,230	$14,930	1.6	71,507
ECM 4	Install High/Low Lighting Controls	Yes	5,535	0.8	-1	$710	$10,990	$8,720	$2,270	3.2	5,438
Variable Frequency Drive (VFD) Measures			**56,872**	**4.8**	**104**	**$9,047**	**$102,800**	**$5,700**	**$97,100**	**10.7**	**69,478**
ECM 5	Install VFDs on Heating Water Pumps	Yes	48,904	4.8	0	$6,430	$62,400	$3,200	$59,200	9.2	49,246
ECM 6	Install VFDs on Kitchen Hood Fan Motors	Yes	7,967	0.0	104	$2,617	$40,400	$2,500	$37,900	14.5	20,232
Unitary HVAC Measures			**1,400**	**0.5**	**0**	**$184**	**$2,000**	**$0**	**$2,000**	**10.9**	**1,410**
ECM 7	Install High Efficiency Air Conditioning Units	Yes	1,400	0.5	0	$184	$2,000	$0	$2,000	10.9	1,410
HVAC System Improvements			**0**	**0.0**	**32**	**$477**	**$560**	**$80**	**$480**	**1.0**	**3,710**
ECM 8	Install Pipe Insulation	Yes	0	0.0	32	$477	$560	$80	$480	1.0	3,710
Domestic Water Heating Upgrade			**0**	**0.0**	**86**	**$1,290**	**$6,510**	**$150**	**$6,360**	**4.9**	**10,040**
ECM 9	Install Low-Flow DHW Devices	Yes	0	0.0	86	$1,290	$6,510	$150	$6,360	4.9	10,040
Food Service & Refrigeration Measures			**3,580**	**0.4**	**0**	**$471**	**$3,730**	**$600**	**$3,130**	**6.6**	**3,605**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	No	820	0.1	0	$108	$2,920	$300	$2,620	24.3	826
ECM 11	Vending Machine Control	Yes	2,760	0.3	0	$363	$810	$300	$510	1.4	2,780
Custom Measures			**-32,826**	**0.0**	**350**	**$950**	**$8,400**	**$0**	**$8,400**	**8.8**	**7,925**
ECM 12	Replace Fossil Fuel Water Heater with Heat Pump Water Heater	Yes	-32,826	0.0	350	$950	$8,400	$0	$8,400	8.8	7,925
TOTALS			**482,767**	**61.5**	**495**	**$70,931**	**$339,570**	**$78,110**	**$261,460**	**3.7**	**544,146**

* - All incentives presented in this table are estimated from the utility run Prescriptive and Custom Rebate program at the beginning of the fiscal year. Always contact your utility provider for details on all current programs.

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

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		**375,426**	**43.8**	**-60**	**$48,461**	**$150,420**	**$23,630**	**$126,790**	**2.6**	**371,032**
ECM 1	Install LED Fixtures	20,000	0.0	0	$2,630	$30,330	$200	$30,130	11.5	20,140
ECM 2	Retrofit Fixtures with LED Lamps	355,426	43.8	-60	$45,832	$120,090	$23,430	$96,660	2.1	350,893
Lighting Control Measures		**78,316**	**12.0**	**-16**	**$10,051**	**$65,150**	**$47,950**	**$17,200**	**1.7**	**76,946**
ECM 3	Install Occupancy Sensor Lighting Controls	72,780	11.1	-15	$9,341	$54,160	$39,230	$14,930	1.6	71,507
ECM 4	Install High/Low Lighting Controls	5,535	0.8	-1	$710	$10,990	$8,720	$2,270	3.2	5,438
Variable Frequency Drive (VFD) Measures		**56,872**	**4.8**	**104**	**$9,047**	**$102,800**	**$5,700**	**$97,100**	**10.7**	**69,478**
ECM 5	Install VFDs on Heating Water Pumps	48,904	4.8	0	$6,430	$62,400	$3,200	$59,200	9.2	49,246
ECM 6	Install VFDs on Kitchen Hood Fan Motors	7,967	0.0	104	$2,617	$40,400	$2,500	$37,900	14.5	20,232
Unitary HVAC Measures		**1,400**	**0.5**	**0**	**$184**	**$2,000**	**$0**	**$2,000**	**10.9**	**1,410**
ECM 7	Install High Efficiency Air Conditioning Units	1,400	0.5	0	$184	$2,000	$0	$2,000	10.9	1,410
HVAC System Improvements		**0**	**0.0**	**32**	**$477**	**$560**	**$80**	**$480**	**1.0**	**3,710**
ECM 8	Install Pipe Insulation	0	0.0	32	$477	$560	$80	$480	1.0	3,710
Domestic Water Heating Upgrade		**0**	**0.0**	**86**	**$1,290**	**$6,510**	**$150**	**$6,360**	**4.9**	**10,040**
ECM 9	Install Low-Flow DHW Devices	0	0.0	86	$1,290	$6,510	$150	$6,360	4.9	10,040
Food Service & Refrigeration Measures		**2,760**	**0.3**	**0**	**$363**	**$810**	**$300**	**$510**	**1.4**	**2,780**
ECM 11	Vending Machine Control	2,760	0.3	0	$363	$810	$300	$510	1.4	2,780
Custom Measures		**-32,826**	**0.0**	**350**	**$950**	**$8,400**	**$0**	**$8,400**	**8.8**	**7,925**
ECM 12	Replace Fossil Fuel Water Heater with Heat Pump Water Heater	-32,826	0.0	350	$950	$8,400	$0	$8,400	8.8	7,925
TOTALS		**481,947**	**61.4**	**495**	**$70,823**	**$336,650**	**$77,810**	**$258,840**	**3.7**	**543,321**

* - All incentives presented in this table are estimated from the utility run Prescriptive and Custom Rebate program at the beginning of the fiscal year. Always contact your utility provider for details on all current prc

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

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		**375,426**	**43.8**	**-60**	**$48,461**	**$150,420**	**$23,630**	**$126,790**	**2.6**	**371,032**
ECM 1	Install LED Fixtures	20,000	0.0	0	$2,630	$30,330	$200	$30,130	11.5	20,140
ECM 2	Retrofit Fixtures with LED Lamps	355,426	43.8	-60	$45,832	$120,090	$23,430	$96,660	2.1	350,893

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 mercury vapor lamps with new LED light fixtures. This measure saves energy by installing LEDs, which use less power than other technologies with a comparable light output.

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

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

Affected Building Areas: exterior ground

ECM 2: 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 T5 and T8 tubes, exterior ground and courtyards, janitorial closets, and the theater

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		**78,316**	**12.0**	**-16**	**$10,051**	**$65,150**	**$47,950**	**$17,200**	**1.7**	**76,946**
ECM 3	Install Occupancy Sensor Lighting Controls	72,780	11.1	-15	$9,341	$54,160	$39,230	$14,930	1.6	71,507
ECM 4	Install High/Low Lighting Controls	5,535	0.8	-1	$710	$10,990	$8,720	$2,270	3.2	5,438

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

ECM 3: Install Occupancy Sensor Lighting Controls

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

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

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

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

Affected Building Areas: classrooms, garages, dining areas, lounges, gymnasium, kitchens, library, locker room, offices, storage room, and the theater

ECM 4: Install High/Low Lighting Controls

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

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

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

For this type of measure the occupancy sensors will generally be ceiling or fixture mounted. Sufficient sensor coverage must be provided to ensure that lights turn on in each area as occupants approach the area. This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

Affected Building Areas: corridors

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**56,872**	**4.8**	**104**	**$9,047**	**$102,800**	**$5,700**	**$97,100**	**10.7**	**69,478**
ECM 5	Install VFDs on Heating Water Pumps	48,904	4.8	0	$6,430	$62,400	$3,200	$59,200	9.2	49,246
ECM 6	Install VFDs on Kitchen Hood Fan Motors	7,967	0.0	104	$2,617	$40,400	$2,500	$37,900	14.5	20,232

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

ECM 5: Install VFDs on Heating Water Pumps

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

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

Affected Pumps: heating hot water pumps

ECM 6: 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 percent.

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

4.4 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**1,400**	**0.5**	**0**	**$184**	**$2,000**	**$0**	**$2,000**	**10.9**	**1,410**
ECM 7	Install High Efficiency Air Conditioning Units	1,400	0.5	0	$184	$2,000	$0	$2,000	10.9	1,410

ECM 7: Install High Efficiency Air Conditioning Units

Replace standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. 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: through-the-wall AC units

4.5 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		**0**	**0.0**	**32**	**$477**	**$560**	**$80**	**$480**	**1.0**	**3,710**
ECM 8	Install Pipe Insulation	0	0.0	32	$477	$560	$80	$480	1.0	3,710

ECM 8: Install Pipe Insulation

Install insulation on domestic hot water system piping. Distribution system thermal losses are dependent on system fluid temperature, the size of the distribution system, and the extent and condition of piping insulation. When the insulation has been damaged due to exposure to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated, system thermal efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

Affected Systems: domestic hot water piping (boiler and chiller rooms)

4.6 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**	**86**	**$1,290**	**$6,510**	**$150**	**$6,360**	**4.9**	**10,040**
ECM 9	Install Low-Flow DHW Devices	0	0.0	86	$1,290	$6,510	$150	$6,360	4.9	10,040

ECM 9: 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. Pre-rinse spray valves (PRSVs), often used in commercial and institutional kitchens, remove food waste from dishes prior to dishwashing.

4.7 Food Service and 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		**3,580**	**0.4**	**0**	**$471**	**$3,730**	**$600**	**$3,130**	**6.6**	**3,605**
ECM 10	Refrigerator/Freezer Case Electrically Commutated Motors	820	0.1	0	$108	$2,920	$300	$2,620	24.3	826
ECM 11	Vending Machine Control	2,760	0.3	0	$363	$810	$300	$510	1.4	2,780

ECM 10: Refrigerator/Freezer Case Electrically Commutated Motors

Consider replacing 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 11: Vending Machine Control

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

4.8 Custom Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Custom Measures		**-32,826**	**0.0**	**350**	**$950**	**$8,400**	**$0**	**$8,400**	**8.8**	**7,925**
ECM 12	Replace Fossil Fuel Water Heater with Heat Pump Water Heater	-32,826	0.0	350	$950	$8,400	$0	$8,400	8.8	7,925

ECM 12: Replace Fossil Fuel Water Heater with Heat Pump Water Heater

We evaluated replacing existing gas water heaters with heat pump water heaters (HPWH).

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

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

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

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

** Note: Uniform Energy Factor (UEF): The newest measure of water heater overall efficiency. The higher the UEF value is, the more efficient the water heater. UEF is determined by the Department of Energy's test method outlined in 10 CFR Part 430, Subpart B, Appendix E.*[6]

HPWH reject cold air. As such, they need to be installed in an unconditioned space of about 750 cubic feet with good ventilation[7]. Ideal locations are garages, large enclosed, unconditioned storage areas, or areas

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

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

with excess heat such as a furnace or boiler room. The HPWH will also produce condensate so accommodations for draining the condensate need to be provided.

Most HPWH operate effectively down to an air temperature of 40°F. Below that temperature, an electric resistance booster heater is typically required to achieve full heating capacity. It is critical that the HPWH controls are set up so that the electric resistance heat only engages when the air temperature is too cold for the HPWH to extract heat from it. HPWHs have a slow recovery. During periods of high demand, the electric resistance heating element, if enabled, may be energized to maintain set point, thus reducing the overall efficiency of the unit. It is recommended that a careful analysis of the hot water demand be conducted to determine if the application makes economic sense, and the HPWH heating capacity and storage are properly sized.

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

Switching from a gas fired water heater to a HPWH has the potential to reduce the sites overall greenhouse gas emissions. If the electricity for the HPWH is provided by an on-site photovoltaic (PV) system then there are essentially no greenhouse gas (GHG) emissions. A 2016 study conducted at Cornell[8] calculated the kg of methane (CH_4) and carbon dioxide (CO_2) produced per GJ of water heated. The study compared HPWH to gas and electric fired, storage and tankless water heaters. The study also considered electricity produced from natural gas and coal fired electric plants. In all cases the study found that HPWHs produced less methane than all of the other water heaters. The study also found that HPWH produced less carbon dioxide than electric resistance water heaters but more carbon dioxide than tankless gas water heaters and about the same amount of carbon dioxide as storage gas water heaters. The summary tables provide the reduction in CO2 equivalent emissions based on the typical New Jersey electric utility.

Affected Units: storage tank water heaters in the boiler room

4.9 Measures for Future Consideration

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

Shore Regional HS 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.

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

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.

Upgrade to a Heat Pump System

Electric resistance heating units work by passing an electric current through wires to heat them. The system is 100% efficient since for every unit of electricity consumed, one unit of heat is produced.

But there is a way to convert electricity to create heat at better than a 1:1 ratio. Heat pumps operate on a more efficient principle, the refrigeration cycle. Instead of directly converting electricity to heat, electricity does the work, via a compressor, of moving refrigerant through a system that transfers heat from a cooler place to a warmer place. That system can move three to five as much energy as is available using electric resistance heating methods. Heat pumps work in a similar manner to an air conditioner, except they reverse the cooling process to circulate warm air instead of cold air. Also, heat pumps are generally capable of dispensing refrigerated air as they can typically be operated in air conditioning mode.

An electric furnace or boiler has no flue loss through a chimney. The AFUE rating for an all-electric furnace or boiler is between 95% and 100 percent. The lower values are for units installed outdoors because they have greater jacket heat loss. However, despite their high efficiency, the higher cost of electricity in most parts of the country makes all-electric furnaces or boilers an uneconomic choice. If you are interested in electric heating, consider installing a heat pump system.

Electric resistance heat, including electric furnaces and baseboard heaters, can be inexpensive to install but often expensive to run. Facilities with these systems can save substantial energy at a moderate cost by installing a heat pump when they replace a central air conditioner.

Even in buildings without central air-conditioning, there are opportunities to save energy when an existing electric furnace needs to be replaced, as well as opportunities to install ductless electric heat pumps in buildings with baseboard electric heaters and electric fan coils. Unit ventilators with built-in electric resistance heaters can be replaced with unit ventilators with integrated heat pumps.

Electric heat pumps have high coefficient of performance (COP) ratings and are substantially more efficient than traditional electric heating systems. Further investigation is required to determine whether installing a heat pump system is a cost-effective solution when replacing existing electrical heating systems.

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

Weatherization

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

Doors and Windows

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

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.

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

Lighting Maintenance

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

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

Lighting Controls

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

Motor Maintenance

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

Fans to Reduce Cooling Load

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

Economizer Maintenance

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

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

Chiller Maintenance

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

Ductwork Maintenance

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

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

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

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

Boiler Maintenance

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

Optimize HVAC Equipment Schedules

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

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

Water Heater Maintenance

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

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

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

Refrigeration Equipment Maintenance

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

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

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

Procurement Strategies

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

6 WATER BEST PRACTICES

Getting Started

The commercial and institutional sector is the second largest consumer of publicly supplied water in the United States, accounting for 17% of the withdrawals from public water supplies[10]. In New Jersey, excluding water used for power generation, approximately 80% of total water use was attributed to potable supply during the period of 2009 to 2018. Water withdrawals for potable supply have not changed noticeably during the period from 1990 to 2018[11].

Water management planning serves as the foundation for any successful water reduction effort. It is the first step a commercial or institutional facility owner or manager should take to achieve and sustain long-term water savings. Understanding how water is used within a facility is critical for the water management planning process. A water assessment provides a comprehensive account of all known water uses at the facility. It allows the water management team to establish a baseline from which progress and program success can be measured. It also enables the water management team to set achievable goals and identify and prioritize specific projects based on the relative savings opportunities and project cost-effectiveness.

Water conservation devices may significantly reduce your water and sewer usage costs. Any reduction in water use reduces grid-level electricity use since a significant amount of electricity is used to treat and deliver water from reservoirs to end users.

For more information regarding water conservation or additional details regarding the practices shown below go to the EPA's WaterSense website[12] or download a copy of EPA's "WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities"[13] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water Metering and Submetering

Tracking a facility's total water use, as well as specific end uses, is a key component of a facility's water-efficiency efforts. Accurately measuring water use can help facility managers identify areas for targeted reductions and track progress from water-efficiency upgrades. If possible, install meters to measure all water conveyed to the facility, regardless of the source. Each source should be metered separately. Consider developing a metering plan and installing separate submeters to measure specific end uses. There are many types and sizes of meters intended for different uses. Installing the correct type and size of meter are critical to accurate water measurement. Sub-metering applications may include:

- Individual tenant spaces
- Cooling tower make-up and blowdown water supply
- Water lines serving other HVAC systems including water circulating loops
- Make up water supply for steam boiler plants with a capacity of 500,000 Btu/hr or greater
- Systems or equipment that use single pass cooling water
- Irrigation systems
- Roof spray systems (for irrigating vegetated roofs or thermal conditioning)
- Ornamental water features

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10 Estimated from analyzing data in: Solley, Wayne B,. et al, "Estimated Use of Water in the United States in 1995", U.S Geological Survey Circular 1200, (1998)

11 https://dep.nj.gov/wp-content/uploads/dsr/trends-water-supply.pdf

12 https://www.epa.gov/watersense

13 https://shorturl.at/mQ8o0

- Indoor and outdoor pools and spas
- Industrial water using processes

Leak Detection and Repair

Identifying and repairing leaks and other water use anomalies within a facility's water distribution system or from processes or equipment can keep a facility from wasting significant quantities of water. Examples of common leaks include leaking toilets and faucets, drip irrigation malfunctions, stuck float valves, and broken distribution lines. Reading meters, installing failure abatement technologies, and conducting visual and auditory inspections are important best practices to detect leaks. Train building occupants, employees, and visitors to report any leaks that they detect. To reduce unnecessary water loss, detected leaks should be repaired quickly. Repairing leaks in water distribution that is pressurized by on-site pumps or in heated or chilled water piping will also reduce energy use.

Toilets and Urinals

Toilets and urinals are considered sanitary fixtures and are found in most facilities. High efficiency fixtures are at least 20% more efficient than available standard products. Leaking or damaged equipment is a substantial source of water waste. Train users to report continuously flushing, leaking, or otherwise improperly operating equipment to the appropriate personnel. Depending on the age of the equipment and the frequency of use, it may be cost effective to replace older inefficient fixtures with current generation WaterSense labeled equipment.

Commercial facilities typically use tank toilets or wall-mount flushometers. Educate and inform users with restroom signage and other means to avoid flushing inappropriate objects. For tank toilets, periodically check to ensure fill valves are working properly and that water level is set correctly. Annually test toilets to ensure the flappers are not worn or allowing water to seep from the tank into the bowl and down the sewer. Control stops and piston valves on flushometer toilets should be checked at least annually.

Most urinals use water to flush liquid. These standard single-user fixtures are present in most facilities. Non-water urinals use a specially designed trap that allows liquid waste to drain out of the fixture through a trap seal, and into the drainage system. Flushing urinals should be inspected at least annually for proper valve and sensor operation. For non-water urinals, follow maintenance practices as directed by the manufacturer to ensure products perform as expected. Non-water urinals can be considered during urinal replacement, however, review the condition and design of the existing plumbing system and the expected usage patterns to ensure that these products will provide the anticipated performance.

Faucets and Showerheads

Faucets and showerheads are sanitary fixtures that generally dispense heated water. Reducing water use by these fixtures translates into a reduction of site fuel or electric use depending on how water is heated. High efficiency fixtures are at least 20% more efficient than available standard products. Leaking or damaged equipment is a substantial source of water waste. Train users to report continuously dripping, leaking, or otherwise improperly operating equipment to the appropriate personnel. Depending on the age of the equipment and the frequency of use, it may be cost effective to replace older fixtures with current generation WaterSense labeled equipment.

Faucets are used for a variety of purposes, and standard flow rates are dictated by the intended use. Public use lavatory faucets and kitchen faucets are subject to maximum flow rates while service sinks are not. Periodically inspect faucet aerators for scale buildup to ensure flow is not being restricted. Clean or replace the aerator or other spout end device as needed. Check and adjust automatic sensors (where installed) to ensure they are operating properly to avoid faucets running longer than necessary. Post materials in restrooms and kitchens to ensure user awareness of the facility's water-efficiency goals. Remind users to turn off the tap when they are done and to consider turning the tap off during sanitation activities when it is not being used. Consider installing lavatory and kitchen faucet fixtures with reduced flow. Federal standards limit kitchen and restroom faucet flows to 2.2 gpm. To qualify for a WaterSense label a faucet cannot exceed 1.5 gpm.

Effective in 1992, the maximum allowable flow rate for all showerheads sold in the United States is 2.5 gpm. Since this standard was enacted, many showerheads have been designed to use even less water. WaterSense labeled equipment is designed to use 2.0 gpm, or less. For optimum showerhead efficiency, the system pressure should be tested to make sure that it is between 20 and 80 pounds per square inch (psi). Verify that plumbing lines are routed through a shower valve to prevent water pressure fluctuations. Periodically inspect showerheads for scale buildup to ensure flow is not being restricted. In general, replace showerheads with 2.5 gpm flow rates or higher with WaterSense labeled models. Note: Use of poor performing replacement reduced flow showerheads may result in increased use if the duration of use is increased to compensate for reduced performance. WaterSense labeled showerheads are independently certified to meet or exceed minimum performance requirements for spray coverage and force.

Commercial Kitchen Equipment

Commercial and institutional sectors, including hospitals, offices, and schools, have substantial kitchen water use. Water in food service is used for steam cooking, spray/flow cleaning, dish washing, and ice making. In most commercial kitchens, the commercial dishwasher and pre-rinse spray valve account for over two-thirds of the water use. Newer technologies and better practices are available that can significantly reduce commercial kitchen equipment water and energy use. For example, ENERGY STAR qualified dishwashers and steam cookers are at least 10% more water-efficient and 15% more energy-efficient than standard models. With some models saving significantly more.

Cooking equipment includes combination ovens, steam cookers, and steam kettles. For efficient steam cooking operation, fill vessels to capacity when possible, set temperatures optimally for the process, and keep doors and lids closed while cooking. Replace gaskets to ensure proper sealing and repair leaks. When replacing combination ovens, select connectionless equipment; replace steam cookers with ENERGY STAR rated steam cookers.

Spray/flow cleaning equipment includes dipper wells, pre-rinse spray valves, food disposals, and wash down sprayers. Turn off water when service periods are slow and keep flow rates to minimum level. Train users to scrape food rather than rely on water pressure. Inspect for leaks and scaling. Test system pressure to ensure it is between 20 and 80 pounds per square inch (psi) for optimum flow and performance of spray equipment. For dipper wells, consider installing in-line flow restrictors to reduce flow. Pre-rinse spray valves can be replaced with new assemblies which use 1.3 gpm or less. Washdown sprayers can be equipped with self-closing nozzles or consider mopping/sweeping as an alternative.

Dishwashers range in type and include undercounter, stationary/hood, conveyor, and flight-type models. Only run dishwashers when they are full, and fill racks to maximum capacity. Be sure to replace damaged dishwasher racks. Educate staff to scrape dishes prior to loading. Ensure that final rinse pressure and water temperature are within the manufacturer’s recommendations. Operate the dishwasher close to or at the minimum flow rate and set rinse cycle time to the manufacturer’s minimum recommended settings. Make sure that manual fill valves close completely after the wash tank is filled. Find and repair any leaks. Inspect valves and rinse nozzles for proper operation and repair worn nozzles. Look for ENERGY STAR qualified models when purchasing or leasing a new commercial dishwasher or replacing an existing unit. Consider your kitchen throughput to select an appropriately sized commercial dishwasher since an oversized dishwasher will waste water if the machine is not loaded to capacity.

Ice Machines

Commercial ice machines use refrigeration units to freeze water into ice. Ice machines typically use water for two purposes: cooling the refrigeration unit and making ice. Because the ice-making process generates a significant amount of heat, either water or air is used to remove this waste heat from the ice machine's refrigeration unit.

Water-cooled ice machines generally pass water through the machine once to cool it and then dispose of the single-pass water down the drain. Water-cooled systems can use less water by recirculating the cooling water through a chiller or a cooling tower to lower the temperature, returning the water to the machine for reuse. To eliminate using water to cool the refrigeration unit altogether, air can be used to cool the unit. Air-cooled ice machines use motor-driven fans or centrifugal blowers to move air through the refrigeration unit to remove heat. In general, water-cooled units are more energy efficient than air-cooled units but use more water. Commercial ice machines that are ENERGY STAR qualified are, on average, 15% more energy-efficient and 10% more water-efficient than standard air-cooled models.

For optimal ice machine efficiency, consider the following:

- Clean the ice machine to remove lime and scale buildup; sanitize it to kill bacteria and fungi. Run the self-cleaning sequence if available. For machines without a self-cleaning mode, shut down the machine, empty the bin of ice, add cleaning or sanitizing solution to the machine, switch it to cleaning mode, and then switch it to ice production mode. For health and safety purposes, create and discard several batches of ice to remove residual cleaning solution.
- Keep the ice machine's coils clean to ensure the heat exchange process is running efficiently.
- Keep the lid closed to preserve cool air and maintain the appropriate temperature.
- Install a timer to shift ice production to off-peak hours to decrease peak energy demand.
- Work with the manufacturer to ensure that the ice machine's rinse cycle is set to the lowest possible frequency that still provides sufficient ice quality and meets local water quality and site requirements.
- Follow the manufacturer's use and care instructions for the specific ice machine model.
- Train users to report leaking or otherwise improperly operating ice machines to the appropriate personnel.

If the machine is cooled using single-pass water, modify the machine to operate on a closed loop that recirculates the cooling water through a cooling tower or heat exchanger, if possible.

When replacing an ice machine or installing a new one, ensure that the new model is sized appropriately to fit the facility's need. Choose an ice machine that is appropriate for the quality of ice needed. Producing ice of higher quality than required will use water unnecessarily. Look for ENERGY STAR qualified models, all of which are air-cooled. Also consider air- or water-cooled ice machines that meet the efficiency specifications outlined by the Consortium for Energy Efficiency. If feasible, consider selecting air-cooled flake or nugget ice machines, which use less water and energy than cubed ice machines.

Landscaping and Irrigation

Most facilities that own or maintain surrounding landscape will have outdoor water use. The amount of outdoor water use is dictated by the size and design of the landscape and the need for supplemental irrigation. Studies show that average landscape water use in the institutional sector can range from 7% of total water use for hospitals, 22% for office buildings, and up to 30% for schools.

Proper landscape design can help minimize outdoor water use. Regionally appropriate plant choices, healthy soils with appropriate grading, the use of mulches, and limiting the use of high water-using plants such as turfgrass can significantly reduce the need for supplemental irrigation. In addition, proper design, installation, and maintenance of irrigation equipment can have a dramatic impact on outdoor water use.

- Retain a landscape professional certified in water-efficient landscaping.
- Maintain soil quality by applying mulch, soil amendments, and good topsoil.
- Maintain existing plants by manually pulling weeds, raising the blade on mowers, and including shaded areas in the overall landscape design.
- Minimize water used for hardscape cleaning and use recycled or reclaimed water where applicable, especially in water features.

Irrigation system optimization combines efficient irrigation practices with efficient technologies and can be complex. Irrigation professionals who are properly educated on water-efficient practices can help ensure that existing irrigation systems are efficiently operated and properly maintained. In general, plan for or adjust irrigation systems to prevent over (or under) watering.

- Improve distribution uniformity so water is evenly applied over the landscape.
- Irrigation schedules should be updated based on changing weather conditions.
- In general, apply water in larger amounts, but less frequently, resulting in deep watering.
- If a dedicated landscape water meter is installed, incorporate an outdoor water budget.
- Routinely look for leaks, overwatering, or overspray.
- Require a full irrigation system audit every 3 years by a qualified irrigation auditor.
- Consider drip irrigation systems for plant beds as they can reduce irrigation water use by 20% to 50% as compared to traditional sprinklers.
- More efficient sprinkler heads can reduce irrigation water use by 30 percent.
- Smart irrigation controllers can schedule irrigation based on weather data or on-site conditions, reducing irrigation water use by 15% compared to manual or clock timer irrigation systems.

7 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.

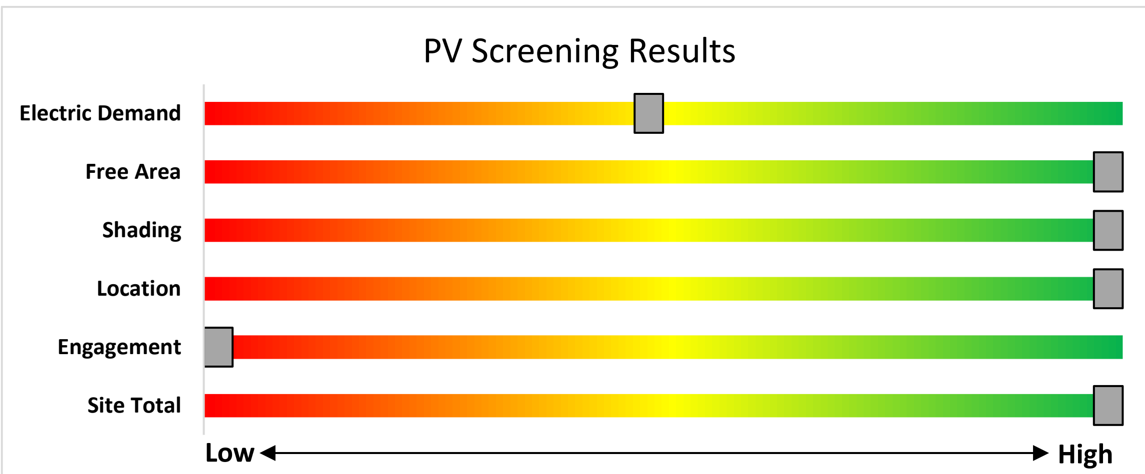
7.1 Solar Photovoltaic

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

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

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

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



Potential	High	
System Potential	473	kW DC STC
Electric Generation	563,518	kWh/yr
Displaced Cost	$74,090	/yr
Installed Cost	$1,229,800	

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**: https://www.njcleanenergy.com/renewable-energy/whysolar
- **NJ Solar Market FAQs**: https://www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the NJ Market**: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1

7.2 Combined Heat and Power

Combined heat and power (CHP) generates electricity at the facility and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

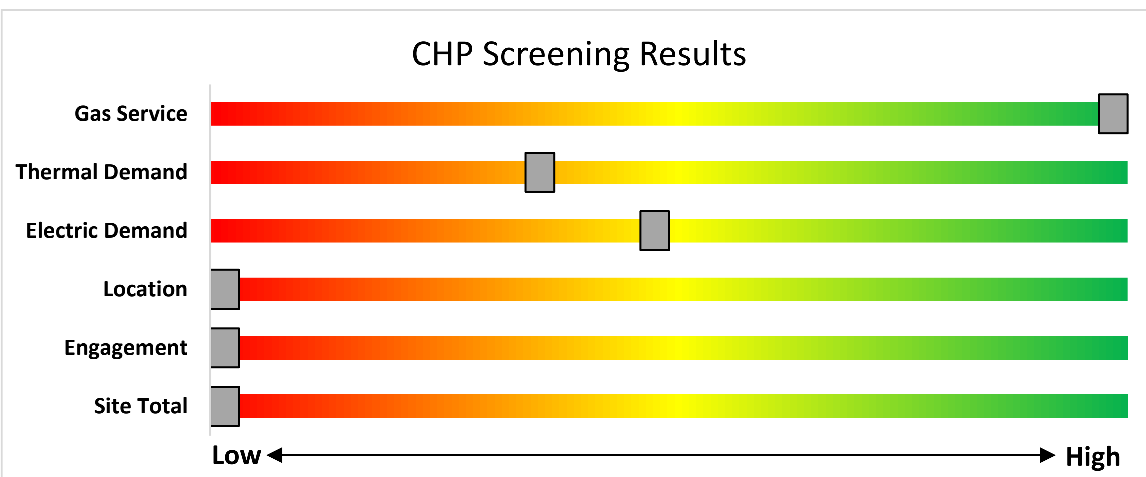
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has **no potential** for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. The low or infrequent thermal load and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

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



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/

8 SUSTAINABLE ENERGY PATHWAYS

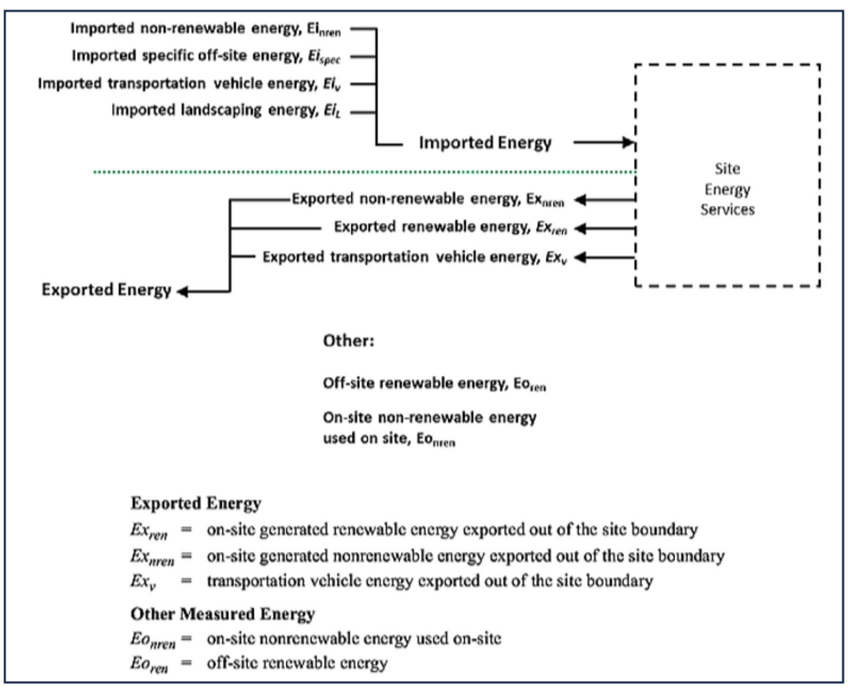
Visions for a climate friendly future include a healthy mix of approaches in all facets where energy is consumed. Strategies for commercial buildings typically include a mix of supply side measures (sustainable generation), and reduced consumption through efficiency upgrades and right-sizing.

The concept of “Zero Net Energy” combines both strategies to bring building energy usage in balance with sustainable production. “Electrification” is a strategy that seeks to minimize the use of fossil fuel at the building so that fuel can be substituted with clean-generated electricity. Electric vehicle (EV) charging, supplied at the building level, can bring help clean fuel to the transportation sector.

8.1 Zero Net Energy and Zero Net Carbon Facilities

In 2015 the United States Department of Energy (US DOE) released a definition of a zero net energy building as “an energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy”[14]. This definition also applies to campuses, portfolios, and communities. In 2023 ASHRAE published Standard 228, which establishes requirements for determining whether a building or group of buildings meets a definition of “zero net energy” or a definition of “zero net carbon” during building operation.”[15].

A facilities energy use can be calculated as site energy or source energy. Site energy is similar to what is measured by utility meters, while source energy includes energy used to extract and process fuels and losses during energy distribution. Source energy quantities used in the standard’s zero net energy formula are calculated by multiplying the site energy use (or energy exports from the site) by source energy conversion factors in the standard.



Energy Flows Across a Site Boundary (ANSI/ASHRAE Standard 228-2023)

[14] A Common Definition for Zero Energy Buildings, US DOE, September 2015
[15] ANSI/ASHRAE Standard 228-2023 Foreword

ANSI/ASHRAE Standard 228-2023, Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance, contains a method of evaluating a building, or group of buildings, to determine if they have achieved "zero net energy" and/or "zero net carbon" operation. Standard 228 can be used during the design and operation phases of new and existing buildings to track energy and carbon performance during the building lifetime to verify whether the annual net energy use and the carbon emissions are zero. Various factors such as weather, building occupancy and overall building condition can impact the buildings energy and carbon use. The methodologies provided in Standard 228 can be used to track a building's energy and carbon use over time to determine if the building is maintaining "zero net" status.

8.2 Electrification

The US DOE reports that, "Electrification converts an energy-consuming device, system, or sector from non-electric sources of energy to electricity. It's an emerging economy-wide decarbonization strategy that is beginning to impact the electric power industry. Electrification is not necessarily the goal, rather a means to achieving a community goal such as reducing greenhouse gas emissions or lowering energy costs. For utilities, the goal—or the benefits—of electrification might be to support system optimization, improve efficiencies, and increase resiliency. Ultimately, people and businesses will choose beneficial electric technologies"[16].

Electrification can help reduce carbon in the atmosphere by reducing the use of fossil fuels at the building level. In many cases, the substitution of fossil fuel burning equipment with electrification technologies can save money. Electrification can foster a more robust or resilient power grid overall by providing utilities more flexibility in load management.

Many opportunities exist for facility managers when replacing fossil fuel equipment through electrification, however, opportunities should be evaluated on a per building basis. Opportunities may include heat pump hot water heaters, heat pump space heating, chilled water systems, and specific process system improvements.

For best results, consider electrification as a "whole systems" building approach. This approach may include generation and battery storage strategies as well as equipment substitution. Consider a wholistic electrification study for your building to help you choose your sustainable energy pathway!

[16] What is Electrification? | Department of Energy

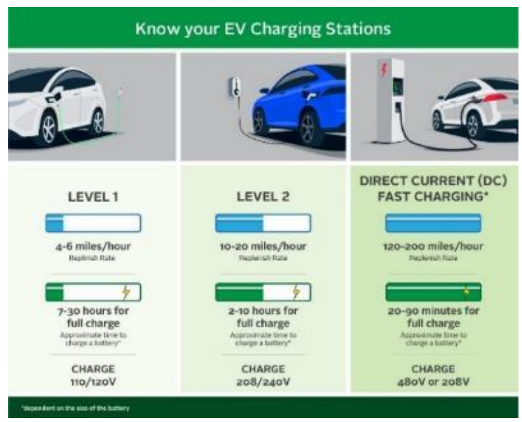
8.3 EV Charging

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.

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.



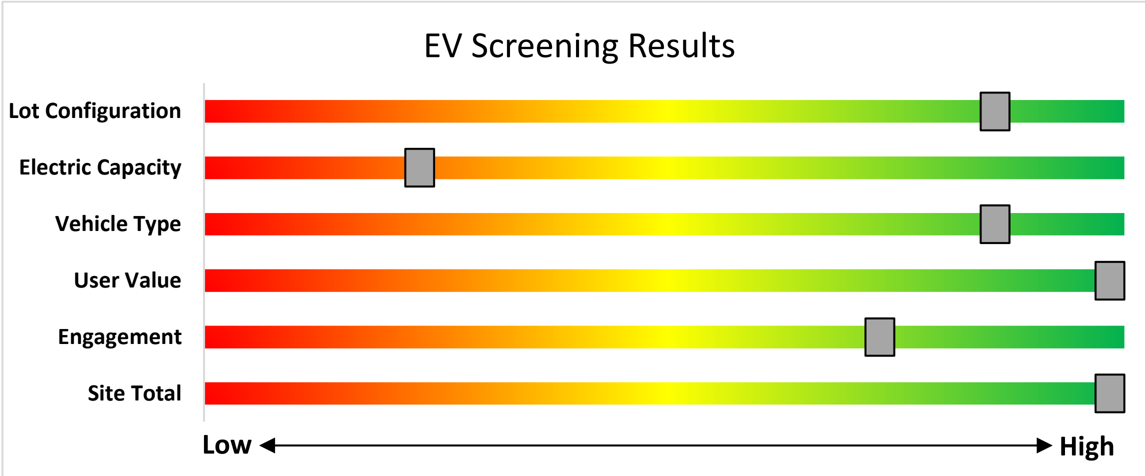
The preliminary assessment of EV charging at the facility shows that there is **high potential** for adding EV chargers at the facility, based on potential costs of installation and other site factors.

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. The location and capacity of facility electric panels also impact charger installation costs. 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. Adding EV charging may have a negative financial impact due to increased electric demand charges.

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.



EV Charger Screening

Electric Vehicle Programs Available

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), Public Service Electric and Gas Company (PSE&G) or Jersey Central Power and Light (JCP&L), 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, PSE&G or JCP&L, up to 90% of the combined charger purchase and installation costs. Please check program eligibility requirements before purchasing EV charging equipment, as additional conditions on types of eligible chargers may apply for utility incentives.

EV Charging incentive information is available from Atlantic City Electric, PSE&G and JCP&L. 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

9 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 New Jersey.

NJBPU and NJCEP Administered Programs

- New Construction (residential, commercial, industrial, government)
- Large Energy Users
- Energy Savings Improvement Program (financing)
- State Facilities Initiative*
- Local Government Energy Audits
- Combined Heat & Power & Fuel Cells

*State facilities are also eligible for utility programs

Utility Administered Programs

- Existing buildings (residential, commercial, industrial, government)
- Efficient Products
  - Lighting & Marketplace
  - HVAC
  - Appliance Rebates
  - Appliance Recycling

9.1 New Jersey's Clean Energy Program

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. To qualify entities must have incurred at least $5 million in total 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 https://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[17]

Eligible Technology	Size (Installed Rated Capacity)	Incentive ($/Watt)[5]	% of Total Cost Cap per Project	$ Cap per Project
CHPs powered by non-renewable or renewable fuel source, or a combination:[4] - Gas Internal Combustion Engine - Gas Combustion Turbine - Microturbine	≤500 kW[1]	$2.00	30-40%[2]	$2 million
	>500 kW - 1 MW[1]	$1.00		
	> 1 MW - 3 MW[1]	$0.55	30%	$3 million
Fuel Cells ≥60%	>3 MW[1]	$0.35		
Fuel Cells ≥40%	Same as above[1]	Applicable amount above	30%	$1 million
Waste Heat to Power (WHP)[3] Powered by non-renewable fuel source. Heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine)	≤1MW[1]	$1.00	30%	$2 million
	> 1MW[1]	$.50	30%	$3 million

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1 Incentives are tiered, which means the incentive levels vary based upon the installed rated capacity, as listed in the chart above. For example, a 4 MW CHP system would receive $2.00/watt for the first 500 kW, $1.00/watt for the second 500 kW, $0.55/watt for the next 2 MW and $0.35/watt for the last 1 MW (up to the caps listed).

2 The maximum incentive will be limited to 30% of total project. For CHP projects up to 1 MW, this cap will be increased to 40% where a cooling application is used or included with the CHP system (e.g. absorption chiller).

3 Projects will be eligible for incentives shown above, not to exceed the lesser of % of total project cost per project cap or maximum $ per project cap. Projects installing CHP or FC with WHP will be eligible for incentive shown above, not to exceed the lesser caps of the CHP or FC incentive. Minimum efficiency will be calculated based on annual total electricity generated, utilized waste heat at the host site (i.e. not lost/rejected), and energy input.

4 Systems fueled by a Class 1 Renewable Fuel Source, as defined by N.J.A.C. 14:8-2.5, are eligible for a 30% incentive bonus. If the fuel is mixed, the bonus will be prorated accordingly. For example, if the mix is 60/40 (60% being a Class 1 renewable), the bonus will be 18%. This bonus will be included in the final performance incentive payment, based on system performance and fuel mix consumption data. Total incentive, inclusive of bonus, shall not exceed above stipulated caps.

5 CHP-FC systems located at Critical Facility and incorporating blackstart and islanding technology are eligible for a 25% incentive bonus. This bonus incentive will be paid with the second/Installation incentive payment. Total incentive, inclusive of bonus, shall not exceed above stipulated caps.

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 https://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 (CSI) Program

The CSI Program opened on April 15, 2023, and will serve as the permanent program within the SuSI Program providing incentives to larger solar facilities. The CSI Program is open to qualifying grid supply solar facilities, non-residential net metered solar installations with a capacity greater than five megawatts ("MW"), and to eligible grid supply solar facilities installed in combination with energy storage. CSI eligible facilities will only be allowed to register in the CSI program upon award of a bid pursuant to N.J.A.C. 14:8-11.10.

The CSI program structure has separate categories, or tranches, to ensure that a range of solar project types, including those on preferred sites, are able to participate despite potentially different project cost profiles. The Board has approved four tranches for grid supply and large net metered solar and an additional fifth tranche for storage in combination with grid supply solar. The following table lists procurement targets for the first solicitation:

Tranche	Project Type	MW (dc) Targets
Tranche 1.	Basic Grid Supply	140
Tranche 2.	Grid Supply on the Built Environment	80
Tranche 3.	Grid Supply on Contaminated Sites and Landfills	40
Tranche 4.	Net Metered Non- Residential	40
Tranche 5.	*Storage Paired with Grid	160 MWh

*The storage tranche of 160 MWh corresponds to a 4-hour storage pairing of 40 MW of solar

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 on your building, visit the following link for more information: https://www.njcleanenergy.com/renewable-energy/SuSI

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 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.

Demand Response (DR) Energy Aggregator

Demand Response Energy Aggregator is a program designed to reduce the electric load when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Grid operators call upon curtailment service providers and commercial facilities to reduce electric usage during times of peak demand, making the grid more reliable and reducing transmission costs for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary, and participants receive payments whether or not their facility is called upon to curtail its electric usage.

Typically, an electric customer must be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with greater capability to quickly curtail their demand during peak hours receive higher payments. Customers with back-up generators on site may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in DR programs often find it to be a valuable source of revenue for their facility, because the payments can significantly offset annual electric costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature setpoints on thermostats (so that air conditioning units run less frequently) or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR curtailment event. DR program participants may need to install smart meters or may need to also sub-meter larger energy-using equipment, such as chillers, to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a DR activity in most situations.

The first step toward participation in a DR program is to contact a curtailment service provider. A list of these providers is available on the website of the independent system operator, PJM, and it includes contact information for each company, as well as the states where they have active business[18]. PJM also posts training materials for program members interested in specific rules and requirements regarding DR activity along with a variety of other DR program information[19].

Curtailment service providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding program rules and requirements for metering and controls, assess a facility's ability to temporarily reduce electric load, and provide details on payments to be expected for participation in the program. Providers usually offer multiple options for DR to larger facilities, and they may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

[18] http://www.pjm.com/markets-and-operations/demand-response.aspx.

[19] https://www.pjm.com/training.

9.2 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.

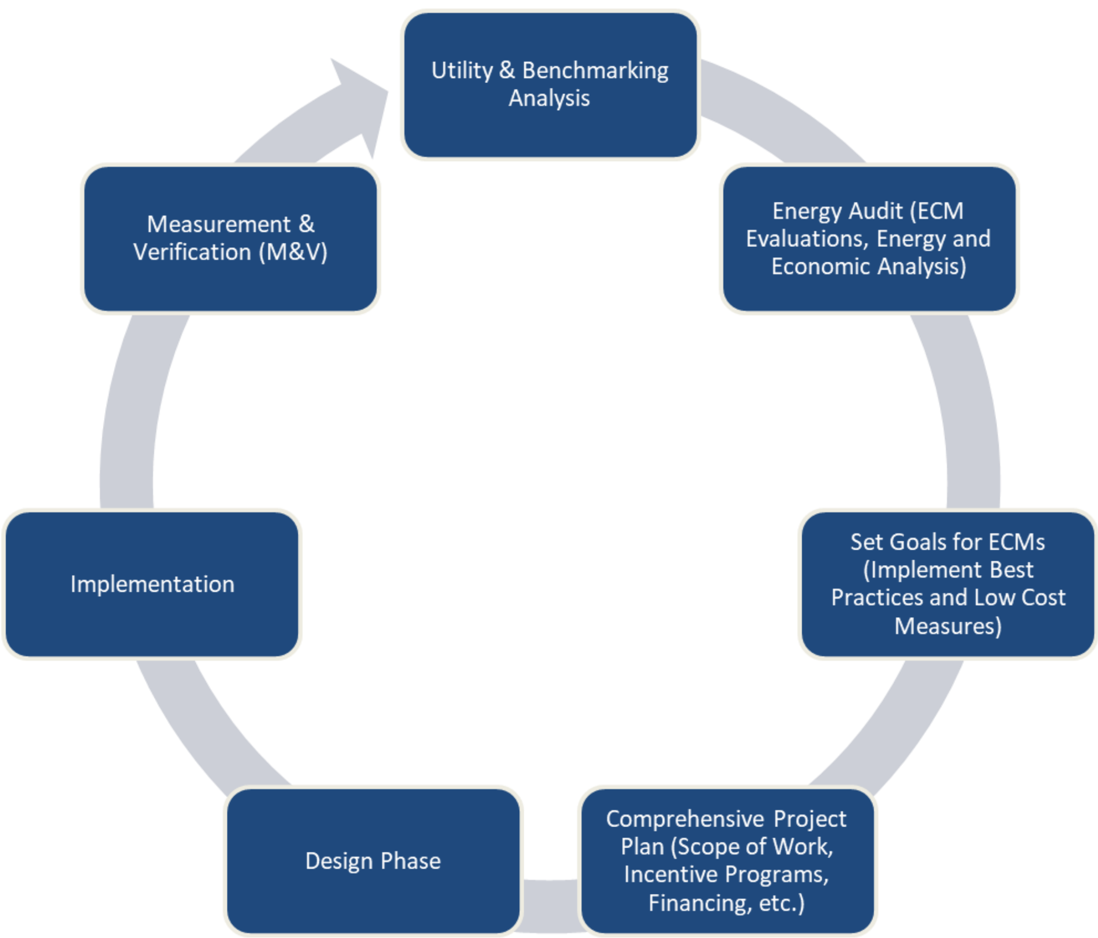
Engineered Solutions

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/EEP.

10 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.



Project Development Cycle

11 Energy Purchasing and Procurement Strategies

11.1 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[20].

11.2 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[21].

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

[21] 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
Boiler Room	3	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Boiler Room	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,300	2	Relamp	No	14	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,300	0.6	3,708	-1	$476	$1,240	$340	1.9
Chiller Room	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Chiller Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,300	2	Relamp	No	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,300	0.4	2,649	-1	$340	$880	$240	1.9
Classroom A10	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom A11	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom A12	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom A13	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom A14	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom A15	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,178	-1	$408	$1,470	$590	2.2
Classroom A16	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,967	0.1	632	0	$81	$560	$200	4.4
Classroom A3	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,300	0.0	80	0	$10	$40	$10	2.9
Classroom A3	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,178	-1	$408	$1,470	$590	2.2
Classroom A4	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,178	-1	$408	$1,470	$590	2.2
Classroom A5	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.4	2,781	-1	$357	$1,040	$500	1.5
Classroom A6	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom A7	5	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,967	0.1	527	0	$68	$190	$40	2.2
Classroom A7	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,788	0	$229	$790	$340	2.0
Classroom A8	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom A9	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom B1	10	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,967	0.2	1,053	0	$135	$710	$330	2.8
Classroom B1	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	2,979	-1	$382	$1,090	$510	1.5
Classroom B2	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.6	4,171	-1	$535	$1,720	$780	1.8
Classroom B5	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom B6	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	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
Classroom C1	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,300	0.0	80	0	$10	$40	$10	2.9
Classroom C1	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,178	-1	$408	$1,470	$590	2.2
Classroom C10	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C11	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C12	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C2	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C3	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,300	0.0	80	0	$10	$40	$10	2.9
Classroom C3	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,178	-1	$408	$1,470	$590	2.2
Classroom C4	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C5	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C6	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C7	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C8	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom C9	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	1.8
Classroom D Weight Room	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.9	5,958	-1	$765	$2,180	$1,020	1.5
Classroom D1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.1	397	0	$51	$100	$20	1.6
Classroom D1	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.6	3,873	-1	$497	$1,150	$560	1.2
Classroom D10	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom D10	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.8	5,561	-1	$714	$2,080	$1,000	1.5
Classroom D2	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom D2	18	LED - Fixtures: Ambient - 8' - Direct Fixture	Wall Switch	S	30	4,300	3	None	Yes	18	LED - Fixtures: Ambient - 8' - Direct Fixture	Occupancy Sensor	30	2,967	0.1	792	0	$102	$660	$450	2.1
Classroom D2	8	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	843	0	$108	$840	$260	5.4
Classroom D3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.1	397	0	$51	$100	$20	1.6
Classroom D3	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.5	3,575	-1	$459	$1,090	$520	1.2
Classroom D5	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,376	-1	$433	$1,520	$630	2.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom D6	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom D6	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	1.1	7,150	-1	$918	$2,810	$1,330	1.6
Classroom D7	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Wall Switch	17	4,300	0.0	80	0	$10	$60	$10	4.8
Classroom D7	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.8	5,065	-1	$650	$1,730	$740	1.5
Classroom D8	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom D8	8	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	843	0	$108	$840	$260	5.4
Classroom D8	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.8	5,561	-1	$714	$2,080	$1,000	1.5
Classroom D9	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	632	0	$81	$710	$200	6.3
Classroom D9	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Classroom D9	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.9	5,958	-1	$765	$1,920	$860	1.4
Classroom E1	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	2,979	-1	$382	$1,090	$510	1.5
Classroom E10	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Classroom E10	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E11	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Classroom E11	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E12	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Classroom E12	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E14	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Classroom E14	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E15	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Classroom E15	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E2	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E3	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E4	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E5	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom E5	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,178	-1	$408	$1,470	$590	2.2
Classroom E6	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Classroom E6	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom E7	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom E7	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.6	3,972	-1	$510	$1,670	$740	1.8
Classroom E8	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Classroom E8	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.4	2,681	-1	$344	$900	$390	1.5
Classroom Music	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom Music	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.8	5,561	-1	$714	$2,080	$1,000	1.5
Corridor A	9	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	9	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor A	6	Incandescent: (5) 50W Track Lamps	Wall Switch	S	250	4,380		None	No	6	Incandescent: (5) 50W Track Lamps	Wall Switch	250	4,380	0.0	0	0	$0	$0	$0	0.0
Corridor A	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	30	4,380		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	30	4,380	0.0	0	0	$0	$0	$0	0.0
Corridor A	55	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,380	2, 4	Relamp	Yes	55	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	High/Low Control	17	3,022	0.9	5,901	-1	$757	$6,300	$2,640	4.8
Corridor B	3	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor B	41	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,380	2, 4	Relamp	Yes	41	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	High/Low Control	17	3,022	0.7	4,399	-1	$565	$4,560	$1,970	4.6
Corridor C	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor C	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	30	4,380		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	30	4,380	0.0	0	0	$0	$0	$0	0.0
Corridor C	28	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,380	2, 4	Relamp	Yes	28	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	High/Low Control	17	3,022	0.4	3,004	-1	$386	$3,180	$1,340	4.8
Corridor D	3	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor D	33	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,380	2, 4	Relamp	Yes	33	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	High/Low Control	17	3,022	0.5	3,541	-1	$454	$3,780	$1,580	4.8
Corridor E	4	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor E	32	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,380	2, 4	Relamp	Yes	32	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	High/Low Control	17	3,022	0.5	3,433	-1	$441	$3,710	$1,540	4.9
Corridor F	7	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	7	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor F	6	Incandescent: (3) 50W Track Lamps	Wall Switch	S	150	4,380		None	No	6	Incandescent: (3) 50W Track Lamps	Wall Switch	150	4,380	0.0	0	0	$0	$0	$0	0.0
Corridor F	29	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,380	2, 4	Relamp	Yes	29	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	High/Low Control	17	3,022	0.5	3,112	-1	$399	$3,240	$1,390	4.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Dining Area 1	4	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Dining Area 1	54	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	54	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	2.4	16,088	-3	$2,065	$4,730	$2,290	1.2
Dining Area 2	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Dining Area 2	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	632	0	$81	$710	$200	6.3
Dining Area 2	51	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	51	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	2.3	15,194	-3	$1,950	$4,540	$2,200	1.2
Exterior Courtyards	16	Metal Halide: (1) 250W Lamp	Timeclock		295	4,380	2	Relamp	No	16	LED Lamps - E39: ≤125 W Lamp	Timeclock	75	4,380	0.0	15,418	0	$2,027	$2,020	$0	1.0
Exterior Ground	46	Compact Fluorescent: (2) 26W Plug-In Lamps	Timeclock		52	4,380	2	Relamp	No	46	LED Lamps: LED Lamps	Timeclock	36	4,380	0.0	3,224	0	$424	$2,910	$780	5.0
Exterior Ground	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Exterior Ground	4	Incandescent: Score Board Lights	Wall Switch		400	500		None	No	4	Incandescent: Score Board Lights	Wall Switch	400	500	0.0	0	0	$0	$0	$0	0.0
Exterior Ground	1	LED Lamps: (3) 15W Screw-In Lamps	Timeclock		45	4,380		None	No	1	LED Lamps: (3) 15W Screw-In Lamps	Timeclock	45	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Ground	25	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock		40	4,380		None	No	25	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	40	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Ground	3	LED - Fixtures: Downlight Surface Mount	Timeclock		30	4,380		None	No	3	LED - Fixtures: Downlight Surface Mount	Timeclock	30	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Ground	16	LED - Fixtures: Downlight Surface Mount	Timeclock		30	4,380		None	No	16	LED - Fixtures: Downlight Surface Mount	Timeclock	30	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior Ground	52	Metal Halide: (1) 250W Lamp	Timeclock		295	4,380	2	Relamp	No	52	LED Lamps - E39: ≤125 W Lamp	Timeclock	75	4,380	0.0	50,107	0	$6,588	$6,570	$0	1.0
Exterior Ground	4	Mercury Vapor: (10) 1500W Lamps	Wall Switch		15,000	500	1	Fixture Replacement	No	4	LED - Fixtures: Landscape/Accent Flood and Spot Luminaires	Wall Switch	5,000	500	0.0	20,000	0	$2,630	$30,330	$200	11.5
Faculty Lounge	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.2	1,589	0	$204	$730	$300	2.1
Garage 1	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,376	-1	$433	$1,520	$630	2.1
Garage 2	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.5	3,376	-1	$433	$1,520	$630	2.1
Garage 3	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Garage 3	9	LED Lamps: (1) 8.5W A19 Screw-In Lamp	Wall Switch	S	9	4,300	3	None	Yes	9	LED Lamps: (1) 8.5W A19 Screw-In Lamp	Occupancy Sensor	9	2,967	0.0	112	0	$14	$330	$230	6.9
Gymnasium Back	6	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Gymnasium Back	2	LED - Fixtures: LED Scoreboard	Wall Switch	S	200	500		None	No	2	LED - Fixtures: LED Scoreboard	Wall Switch	200	500	0.0	0	0	$0	$0	$0	0.0
Gymnasium Back	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.1	794	0	$102	$530	$150	3.7
Gymnasium Back	30	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	S	176	4,300	2, 3	Relamp	Yes	30	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	2,967	2.5	16,456	-3	$2,112	$4,830	$1,740	1.5
Gymnasium Main	8	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0

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Gymnasium Main	2	LED - Fixtures: LED Scoreboard	Wall Switch	S	200	500		None	No	2	LED - Fixtures: LED Scoreboard	Wall Switch	200	500	0.0	0	0	$0	$0	$0	0.0
Gymnasium Main	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.2	1,589	0	$204	$730	$300	2.1
Gymnasium Main	36	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	S	176	4,300	2, 3	Relamp	Yes	36	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	2,967	3.0	19,747	-4	$2,534	$6,000	$2,200	1.5
Janitorial B	1	Incandescent: (1) 60W Screw-In Lamp	Wall Switch	S	60	4,300	2	Relamp	No	1	LED Lamps: (1) 8.5W Screw-In Lamp	Wall Switch	9	4,300	0.0	241	0	$31	$30	$0	1.0
Janitorial B2	1	Incandescent: (1) 60W Screw-In Lamp	Wall Switch	S	60	4,300	2	Relamp	No	1	LED Lamps: (1) 8.5W Screw-In Lamp	Wall Switch	9	4,300	0.0	241	0	$31	$30	$0	1.0
Janitorial B3	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Wall Switch	17	4,300	0.0	80	0	$10	$60	$10	4.8
Janitorial C	1	Incandescent: (1) 60W Screw-In Lamp	Wall Switch	S	60	4,300	2	Relamp	No	1	LED Lamps: (1) 8.5W Screw-In Lamp	Wall Switch	9	4,300	0.0	241	0	$31	$30	$0	1.0
Janitorial D	1	Incandescent: (1) 60W Screw-In Lamp	Wall Switch	S	60	4,300	2	Relamp	No	1	LED Lamps: (1) 8.5W Screw-In Lamp	Wall Switch	9	4,300	0.0	241	0	$31	$30	$0	1.0
Janitorial E	1	Incandescent: (1) 60W Screw-In Lamp	Wall Switch	S	60	4,300	2	Relamp	No	1	LED Lamps: (1) 8.5W Screw-In Lamp	Wall Switch	9	4,300	0.0	241	0	$31	$30	$0	1.0
Kitchen	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen	6	Incandescent: (1) 200W Heating Lamp	Wall Switch	S	200	1,000		None	No	6	Incandescent: (1) 200W Heating Lamp	Wall Switch	200	1,000	0.0	0	0	$0	$0	$0	0.0
Kitchen	36	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,300	3	None	Yes	36	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,967	0.3	2,111	0	$271	$990	$900	0.3
Library 1	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Library 1	18	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.3	1,896	0	$243	$1,800	$590	5.0
Library 1	30	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,300	2, 3	Relamp	Yes	30	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,967	1.6	10,498	-2	$1,347	$3,310	$1,380	1.4
Locker Room 1	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 1	25	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	25	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.8	4,965	-1	$637	$1,920	$930	1.6
Locker Room 2	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 2	25	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	25	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.8	4,965	-1	$637	$1,920	$930	1.6
Locker Room 3	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 3	25	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	25	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.8	4,965	-1	$637	$1,920	$930	1.6
Locker Room 4	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 4	25	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	25	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.8	4,965	-1	$637	$1,920	$930	1.6
Locker Room 5	2	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 5	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.3	1,986	0	$255	$840	$370	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 - Activities	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Activities	10	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.2	1,053	0	$135	$960	$330	4.7
Office - Attendance	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Attendance	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	632	0	$81	$710	$200	6.3
Office - BOE	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - BOE	10	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.2	1,053	0	$135	$960	$330	4.7
Office - Enclosed Admin	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	632	0	$81	$710	$200	6.3
Office - Enclosed Admin 2	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed Admin 2	7	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	7	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	737	0	$95	$770	$240	5.6
Office - Enclosed Athletics	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed Athletics	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	632	0	$81	$710	$200	6.3
Office - Enclosed Attendance 1	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Office - Enclosed Attendance 2	2	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.0	211	0	$27	$280	$70	7.8
Office - Enclosed Attendance 3	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Office - Enclosed Custodial	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed Custodial	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	30	4,300		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	30	4,300	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed Custodial	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Office - Enclosed Custodial	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.2	1,192	0	$153	$630	$220	2.7
Office - Enclosed F	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Office - Enclosed Nurse	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed Nurse	12	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.2	1,264	0	$162	$1,090	$400	4.3
Office - Enclosed Superintendent	8	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	843	0	$108	$840	$260	5.4
Office - Guidance	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Guidance	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	632	0	$81	$710	$200	6.3
Office - Main	3	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	2	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
Office - Main	28	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	28	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.4	2,949	-1	$379	$2,430	$880	4.1
Office - Main Enclosed	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Main Enclosed	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Office - Main Enclosed 2	2	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.0	211	0	$27	$280	$70	7.8
Office - Main Enclosed 3	2	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.0	211	0	$27	$280	$70	7.8
Office - Main Enclosed 4	2	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.0	211	0	$27	$280	$70	7.8
Office - Main Enclosed 5	2	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.0	211	0	$27	$280	$70	7.8
Office - Main Enclosed 6	2	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.0	211	0	$27	$280	$70	7.8
Office - Main Enclosed 7	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Office - Main Enclosed 8	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Office - Main Enclosed 9	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Office - Open Plan E	1	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Open Plan E	113	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	113	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	1.8	11,903	-2	$1,528	$9,790	$3,550	4.1
Office - Work Center	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Press Box	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.1	596	0	$76	$480	$120	4.7
Restroom - 1A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Restroom - 2A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Restroom - Athletics	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Restroom - BOE	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Restroom - Main 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Restroom - Main 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Restroom - Nurse 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Restroom - Nurse 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Restroom - Female B	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Restroom - Female B2	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restroom - Female E	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Restroom - Female Staff C	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Wall Switch	17	4,300	0.0	80	0	$10	$60	$10	4.8
Restroom - Female Staff D	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Wall Switch	17	4,300	0.0	80	0	$10	$60	$10	4.8
Restroom - Male A	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Restroom - Male B	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Restroom - Male B2	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Restroom - Male C	4	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	421	0	$54	$580	$130	8.3
Restroom - Male Staff D	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Wall Switch	17	4,300	0.0	80	0	$10	$60	$10	4.8
Restroom - Unisex D7	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,300	0.0	156	0	$20	$50	$10	2.0
Snack Shed	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,967	0.2	1,192	0	$153	$630	$220	2.7
Storage B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,950	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,346	0.1	270	0	$35	$280	$90	5.5
Storage E	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,950	2, 3	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,346	0.3	991	0	$127	$890	$410	3.8
Storage E2	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	1,950	2	Relamp	No	1	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Wall Switch	17	1,950	0.0	36	0	$5	$60	$10	10.7
Storage F	1	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	1,950	2	Relamp	No	1	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Wall Switch	17	1,950	0.0	36	0	$5	$60	$10	10.7
Storage F2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,950	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,346	0.1	180	0	$23	$250	$70	7.8
Student Assistance	6	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.1	632	0	$81	$710	$200	6.3
Tech Dept	2	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Wall Switch	S	34	4,300	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 2' T5 (8W) Lamps	Occupancy Sensor	17	2,967	0.0	211	0	$27	$280	$70	7.8
Theater 1	5	Exit Signs: LED - 2 W Lamp	None		2	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Theater 1	30	Incandescent: (1) 100W Stage Lamps	Wall Switch	S	100	1,000		None	No	30	Incandescent: (1) 100W Stage Lamps	Wall Switch	100	1,000	0.0	0	0	$0	$0	$0	0.0
Theater 1	54	Incandescent: (1) 60W Screw-In Lamp	Wall Switch	S	60	4,300	2, 3	Relamp	Yes	54	LED Lamps: (1) 8.5W Screw-In Lamp	Occupancy Sensor	9	2,967	2.1	13,739	-3	$1,763	$2,690	$1,460	0.7
Theater 1	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,300	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,967	0.5	3,575	-1	$459	$1,090	$520	1.2

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
Chiller Room	Chilled Water Loop	2	Chilled Water Pump	30.00	94.1%	Yes	Baldor	EM2535T	W	1,000		No	94.1%	No		0.0	0	0	$0	$0	$0	0.0
Chiller Room	Chilled Water Loop	2	Chilled Water Pump	20.00	93.0%	No	Baldor	EM2515T	W	1,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Heating and Cooling	76	Fan Coil Unit	1.00	85.5%	No	Unknown	Unknown	W	3,500		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Exhaust	31	Exhaust Fan	0.25	65.0%	No	Unknown	Unknown	W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Exhaust	36	Exhaust Fan	0.50	70.0%	No	Unknown	Unknown	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Exhaust	10	Exhaust Fan	1.00	85.5%	No	Unknown	Unknown	W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Gymnasium Back	Basketball Hoop	6	Other	0.50	65.0%	No	Unknown	Unknown	W	10		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Gymnasium Main	Basketball Hoop	6	Other	0.50	65.0%	No	Unknown	Unknown	W	10		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Exhaust	5	Kitchen Hood Exhaust Fan	1.00	85.5%	No	Unknown	Unknown	W	2,400	6	No	85.5%	Yes	5	0.0	7,967	104	$2,617	$40,400	$2,500	14.5
Boiler Room	Hot Water Loop	1	Heating Hot Water Pump	25.00	94.1%	No	Baldor	EM2531T	W	3,290	5	No	94.1%	Yes	1	2.4	24,452	0	$3,215	$31,200	$1,600	9.2
Boiler Room	Hot Water Loop	1	Heating Hot Water Pump	25.00	94.1%	No	Unknown	EC59140	W	3,290	5	No	94.1%	Yes	1	2.4	24,452	0	$3,215	$31,200	$1,600	9.2
Boiler Room	Domestic Hot Water	2	DHW Circulation Pump	0.04	65.0%	No	Taco	Unknown	W	8,760		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Chiller Room	Domestic Hot Water	2	DHW Circulation Pump	0.13	65.0%	No	Taco	Unknown	W	8,760		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Gym Storage G-7A	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	International Environmental Corporation	HBC30	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Equipment Storage G-8A	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	International Environmental Corporation	HBC30	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Girls Gym G-7	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	AAON	H2-D2-2-40-200	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Girls Gym G-7	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	AAON	H2-D2-2-40-200	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Mer G-4	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	AAON	H2-D2-2-40-200	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Storage G-9	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	International Environmental Corporation	HBC30	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Storage F-3A	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	International Environmental Corporation	HBC30	W	3,500		No	86.6%	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
Team Room B-5A	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	International Environmental Corporation	HBC30	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Team Room B-7A	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	International Environmental Corporation	HBC30	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Boys Gym B-6	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	AAON	H2-D2-2-40-200	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Boys Gym B-6	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	AAON	H2-D2-2-40-200	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Mech B-25E	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	International Environmental Corporation	VBY40	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Mech Closet B-25A	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	International Environmental Corporation	VBY40	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	No	AAON	RN020	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	1	Makeup Air Fan	1.00	86.6%	No	Trane	YHCO36E3RXA29 H2B3A1B6	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	1	Makeup Air Fan	1.00	86.6%	No	Trane	YHCO36E3RXA29 H2B3A1B7	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	1	Makeup Air Fan	1.00	86.6%	No	Trane	YHCO36E3RXA29 H2B3A1B8	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	1	Makeup Air Fan	1.00	86.6%	No	Trane	YHCO36E3RXA29 H2B3A1B9	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN009	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN009	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN009	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN009	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN009	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN009	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN009	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN016	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0
Shore Regional HS	Shore Regional HS	2	Supply Fan	2.00	86.6%	Yes	AAON	RN026	W	3,500		No	86.6%	No		0.0	0	0	$0	$0	$0	0.0

Packaged HVAC Inventory & Recommendations

		Existing Conditions									Proposed Conditions								Energy Impact & Fin		
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Tot Ann MM Savi
Garage 1	Garage 1	1	Unit Heater		30.00		0.8 AFUE	Dayton	Unknown	W		No							0.0	0	0
Garage 2	Garage 2	1	Unit Heater		30.00		0.8 AFUE	Dayton	Unknown	W		No							0.0	0	0
Garage 1	Garage 1	1	Through-The-Wall AC	1.00		8.00		Unknown	Unknown	B	7	Yes	1	Through-The-Wall AC	1.00		12.00		0.3	700	0
Garage 2	Garage 2	1	Through-The-Wall AC	1.00		8.00		Unknown	Unknown	B	7	Yes	1	Through-The-Wall AC	1.00		12.00		0.3	700	0
Exterior Ground	Shore Regional HS	1	Ductless Mini-Split AC	3.00		10.80		Mitsubishi Electric	PUY-A36NKA7	N		No							0.0	0	0
Shore Regional HS	Shore Regional HS	1	Package Unit	3.00	48.00	12.00	0.8 AFUE	Trane	YHCO36E3RXA29H2B3A1B6	N		No							0.0	0	0
Shore Regional HS	Shore Regional HS	1	Package Unit	3.00	48.00	12.00	0.8 AFUE	Trane	YHCO36E3RXA29H2B3A1B7	N		No							0.0	0	0
Shore Regional HS	Shore Regional HS	1	Package Unit	3.00	48.00	12.00	0.8 AFUE	Trane	YHCO36E3RXA29H2B3A1B8	N		No							0.0	0	0
Shore Regional HS	Shore Regional HS	1	Package Unit	3.00	48.00	12.00	0.8 AFUE	Trane	YHCO36E3RXA29H2B3A1B9	N		No							0.0	0	0
Ground Floor	Classrooms E1,2,3,4,6,8,10,11,12,14 (ERU-8)	1	Package Unit	16.00	230.40			AAON	RN026	W		No							0.0	0	0
Ground Floor	Classrooms A4,6,8,10,12,14,16) (ERU-7)	1	Package Unit	16.00	230.40			AAON	RN 016-8	B		No							0.0	0	0
Ground Floor	Auditorium (PAC1)	1	Package Unit	26.00	268.80			AAON	RN 016-8	B		No							0.0	0	0
Courtyard	ERU-1 - Art Studio Rooms D1, D2,D3	1	Package Unit	9.00	192.00			AAON	RN 026-3	B		No							0.0	0	0
Courtyard	ERU-3 - Rooms E5,7,9,15	1	Package Unit	9.00	192.00			AAON	RN 009-8	B		No							0.0	0	0
Courtyard	ERU-4 - Rooms C2,4,6,8,10,12	1	Package Unit	9.00	192.00			AAON	RN 009-8	B		No							0.0	0	0
Courtyard	ERU-5 - Rooms C5,7,9,11	1	Package Unit	9.00	192.00			AAON	RN 009-8	B		No							0.0	0	0
Courtyard	ERU-6 - Rooms A5,7,9,11,13,15	1	Package Unit	9.00	192.00			AAON	RN 009-8	B		No							0.0	0	0
Courtyard	ERU-2 - Rooms B12, B13	1	Package Unit	9.00	192.00			AAON	RN 009-8	B		No							0.0	0	0

Electric Chiller Inventory & Recommendations

		Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Exterior Ground	Shore Regional HS	1	Air-Cooled Scroll Chiller	250.00	Trane	RTAC 2504 UROH UAGN N1TY 1DDN RD0F A11A R0EX N	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 (kBtu/hr)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (kBtu/hr)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Hot Water Loop	5	Condensing Hot Water Boiler	1,920	Mach	C-2000	W		No						0.0	0	0	$0	$0	$0	0.0

Pipe Insulation Recommendations

		Recommendation Inputs			Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	DHW	8	20	2.00	0.0	0	16	$238	$280	$40	1.0
Chiller Room	DHW	8	20	2.00	0.0	0	16	$238	$280	$40	1.0

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Manufacturer	Model	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Shore Regional HS	2	Storage Tank Water Heater (> 50 Gal)	A.O. Smith	BTR-365A 118	W		No						0.0	0	0	$0	$0	$0	0.0
Chiller Room	Shore Regional HS	1	Storage Tank Water Heater (> 50 Gal)	A.O. Smith	BTH 300A 100	W		No						0.0	0	0	$0	$0	$0	0.0
Chiller Room	Shore Regional HS	1	Storage Tank Water Heater (> 50 Gal)	A.O. Smith	BTH 300A 300	N		No						0.0	0	0	$0	$0	$0	0.0

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
Shore Regional HS	9	64	Faucet Aerator (Kitchen)	2.00	1.50	0.0	0	9	$134	$540	$60	3.6
Shore Regional HS	9	36	Faucet Aerator (Lavatory)	1.80	0.50	0.0	0	13	$197	$300	$40	1.3
Shore Regional HS	9	54	Showerhead	3.00	1.50	0.0	0	63	$955	$5,650	$50	5.9
Shore Regional HS	9	2	Faucet Aerator (Kitchen)	2.00	1.50	0.0	0	0	$4	$20	$0	4.8

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)	Penn	Unknown	10	Yes	No	No	0.0	410	0	$54	$1,460	$150	24.3
Kitchen	1	Low Temp Freezer (-35F to -5F)	Unknown	Unknown	10	Yes	No	No	0.0	410	0	$54	$1,460	$150	24.3

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
Classroom D5	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Frigidaire	FPFU19F8RFC	No		No	0.0	0	0	$0	$0	$0	0.0
Classroom D5	1	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	Frigidaire	FPFU19F8RFC	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	Beverage-Air	MMR49HC-1-B	Yes		No	0.0	0	0	$0	$0	$0	0.0
Classroom D2	1	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	Unknown	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	Unknown	Unknown	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
Classroom D2	1	Self-Contained Unit (<175 lbs/day), Batch	Hoshizaki	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Self-Contained Unit (<175 lbs/day), Batch	Unknown	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	Manufacturer	Model	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Gas Fryer	Hobart	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Griddle (4 Feet Width)	Hobart	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Classroom D5	5	Residential Stove/Oven	Frigidaire	Unknown	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Rack Oven (Double)	Blodgett	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stove/Oven	Hobart	Unknown	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
Classroom A3	1	Under Counter (High Temp)	Frigidaire	Unknown	Natural Gas	None	No		No	0.0	0	0	$0	$0	$0	0.0
Classroom D5	1	Under Counter (High Temp)	Frigidaire	Unknown	Natural Gas	None	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
Chiller Room	1	Clothes Dryer	3,000	No	Various	Various
Chiller Room	1	Clothes Washer	1,200	No	Various	Various
Shore Regional HS	4	Coffee Machine	600	No	Various	Various
Shore Regional HS	175	Desktop	270	No	Various	Various
Shore Regional HS	730	Laptops	75	No	Various	Various
Shore Regional HS	3	Fan (Portable)	100	No	Various	Various
Shore Regional HS	14	Microwave	1,500	No	Various	Various
Classrooms	10	Smart Board	300	No	Various	Various
Shore Regional HS	5	Stand Mixers	300	No	Various	Various
Classroom D5	20	Shop Equipment	600	No	Various	Various
Classroom D8	1	Laser Cutter	2,000	No	Various	Various
Classroom D3	1	Hand Drier	700	No	Various	Various
Classroom D2	1	Treadmill	3,000	No	Various	Various
Classroom D1	1	Kiln	3,000	No	Various	Various
Shore Regional HS	5	Network Equipment	500	No	Various	Various
Kitchen	6	Food Warmer	500	No	Various	Various
Garage 3	2	Garage Door	300	No	Various	Various
Theater 1	1	Speakers	500	No	Various	Various
Shore Regional HS	4	Paper Shredder	200	No	Various	Various
Shore Regional HS	20	Printer (Medium/Small)	300	No	Various	Various
Shore Regional HS	10	Printer/Copier (Large)	600	No	Various	Various
Shore Regional HS	45	Projector	300	No	Various	Various
Shore Regional HS	12	Refrigerator (Mini)	126	No	Various	Various
Shore Regional HS	2	Refrigerator (Residential)	500	No	Various	Various
Shore Regional HS	1	Scanner/Fax Machine	10	No	Various	Various
Shore Regional HS	8	Television	240	No	Various	Various
Shore Regional HS	4	Toaster Oven	1,000	No	Various	Various
Shore Regional HS	5	Water Cooler	600	No	Various	Various
Shore Regional HS	6	Water Fountain	200	No	Various	Various

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Dining Area 1	2	Glass Fronted Refrigerated	11	Yes	0.3	2,418	0	$318	$540	$250	0.9
Dining Area 1	1	Non-Refrigerated	11	Yes	0.0	343	0	$45	$270	$50	4.9

Custom (High Level) Measure Analysis

Fossil Fuel Tank Water Heater to HPWH

Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis										
Description	Area(s)/System(s) Served	SF of Area Served	Fuel Type	Input Capacity per Unit (kBtu/hr)	Tank Capacity per Unit (Gal)	Description	COP	Tank Capacity per Unit (Gal)	Estimated Unit Cost	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Payback w/ Incentives in Years
Storage Tank Water Heater (>50 Gal)	Shore Regional HS	25,000	Natural Gas	365.0	85	Heat Pump Water Heater	2.5	85	$3,500.00	0.00	-16,413	175	$475	$4,200	-$2,120	$0	$0	$4,200	8.84	8.84
Storage Tank Water Heater (>50 Gal)	Shore Regional HS	25,000	Natural Gas	365.0	85	Heat Pump Water Heater	2.5	85	$3,500.00	0.00	-16,413	175	$475	$4,200	-$2,120	$0	$0	$4,200	8.84	8.84

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]

Shore Regional High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 155,000
Built: 1961

For Year Ending: January 31, 2024
Date Generated: February 19, 2025

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
Shore Regional High School 132 Monmouth Park Highway West Long Branch, New Jersey 07764	Shore Regional High School 132 Monmouth Park Hwy West Long Branch, NJ 07764 (732) 222-9300	Andrew Polo 132 Monmouth Park Hwy West Long Branch, NJ 07764 (732) 222-9300 apolo@shoreregional.org

Property ID: 43599592

Energy Consumption and Energy Use Intensity (EUI)

Site EUI 99.3 kBtu/ft²	**Annual Energy by Fuel**		**Annual Emissions**	
	Electric - Grid (kBtu)	6,525,621 (42%)	Total (Location-Based) GHG Emissions (Metric Tons CO2e/ year)	1,044
	Natural Gas (kBtu)	8,870,867 (58%)		
Source EUI 178 kBtu/ft²	**National Median Comparison**		**Green Power**	
	National Median Site EUI (kBtu/ft²)	72	Green Power – Onsite (kWh)	N/A
	National Median Source EUI (kBtu/ft²)	129.1	Green Power – Offsite (kWh)	0
	% Diff from National Median Source EUI	38%	Percent of RECs Retained	N/A

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
ASHP	*Air source heat pump. A* space conditioning system that transfers heat between a building and the air outside the building using a vapor-compression refrigeration process.
BAS	*Building Automation System*. The automatic centralized control of a building's HVAC (heating, ventilation, and air conditioning), electrical, lighting, shading, access control, security systems, and other interrelated systems. Also known as building management system (BMS) or energy management system (EMS).
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your annual bill by the total annual energy use. For example, if your bill is $15,000, and you used 85,750 kilowatt-hours, your blended rate is 17.5 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.
DCV	*Demand control ventilation.* A control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupant ventilation needs.
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.
DHW	*Domestic hot water. H*eated potable water.
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.
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 a government-backed program that helps consumers and businesses identify and purchase energy-efficient projects, homes, and buildings. The ENERGY STAR program is managed by the EPA.
EPA	*United States Environmental Protection Agency*

EUI	*Energy Use Intensity. A* measurement of energy consumption per square foot. A standard metric for comparing buildings' energy performance.
EV	*Electric vehicle. A* transportation vehicle power directly by electricity.
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gas gases.* 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	*Gallons 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* (alternate to MBtu)
KBtu/hr	*Thousand Btu per hour*
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.
MBtu	*One thousand British thermal units (alternate to kBtu)*
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.
MMBtu	*One million British thermal units*

MV	*Mercury Vapor. A* type of HID lamp.
Net Zero	Refers to an energy-efficient building or campus where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy.
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.
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PPA	*Power Purchase Agreement*. A long-term contract between a customer and a third party to purchase electricity.
psia	*Pounds per square inch absolute pressure*
psig	*Pounds per square inch gauge*
PV	*Photovoltaic.* Refers to an electronic device capable of converting incident light directly into electricity (direct current); also known as a solar panel.
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.
US DOE	*United States Department of Energy*
VAV	*Variable air volume.* Heating, ventilation, and air conditioning (HVAC) systems that control air flow and temperature to meet building zone needs.
VFD	*Variable frequency drive. A* controller used to vary the speed of an electric motor, also VSD, *variable speed drive.*

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.
WSHP	*Water source heat pump. A* space conditioning system that transfers heat between a building and a water source using a vapor-compression refrigeration process.