Local Government Energy Audit Report

Selover School (BOE Office)

February 8, 2019

Prepared for:

Sayreville Public Schools
150 Lincoln St
South Amboy, NJ 08879

Prepared by:

TRC Energy Services
900 Route 9 North
Woodbridge, NJ 07095

Disclaimer

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

TRC Energy Services (TRC) reviewed the energy conservation measures and estimates of energy savings were reviewed 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 installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

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

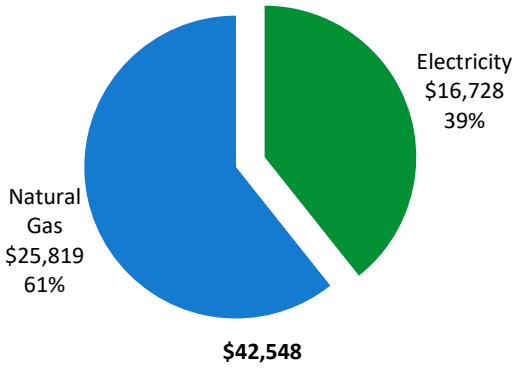
The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

Table of Contents

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Selover School (BOE Office). 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 Energy Services (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 help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $42,548 Electricity: 121,108 kWh Natural Gas: 29,333 Therms	
ENERGY STAR® Benchmarking Score	N/A *(1-100 scale)*	This building does not qualify for an ENERGY STAR® Score due to its usage characteristics being Mixed-Use.

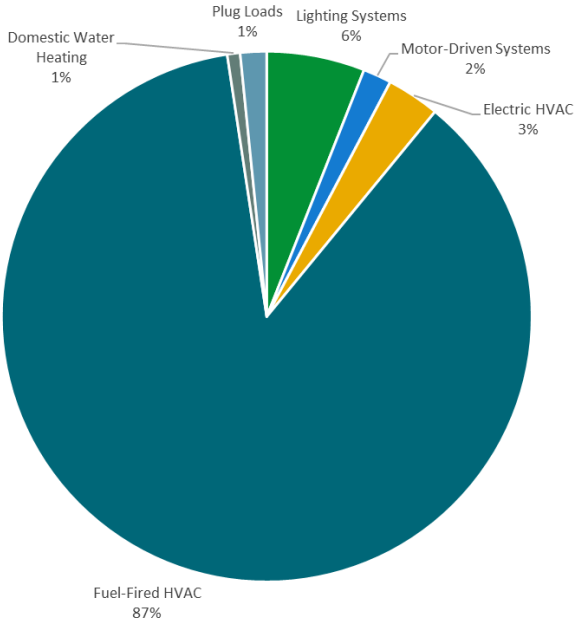


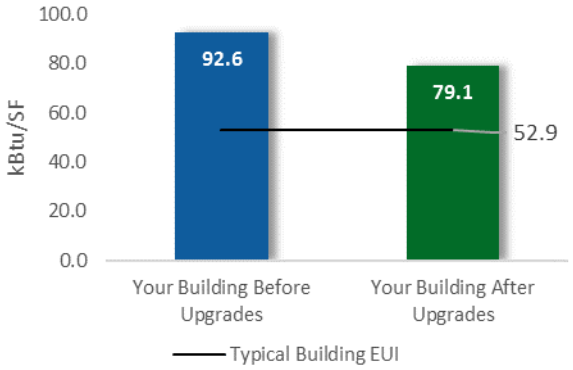
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

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

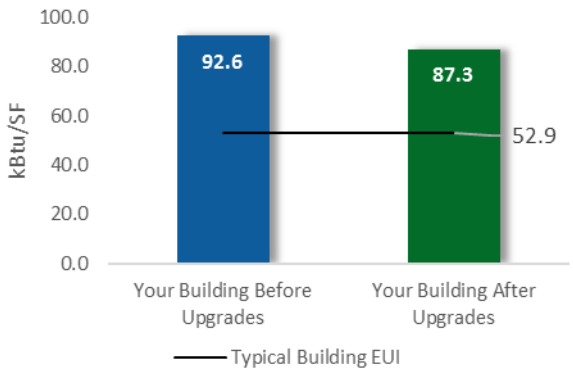
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$121,294
Potential Rebates & Incentives[1]	$8,486
Annual Cost Savings	$9,540
Annual Energy Savings	Electricity: 48,541 kWh Natural Gas: 3,221 Therms
Greenhouse Gas Emission Savings	43 Tons
Simple Payback	11.8 Years
Site Energy Savings (all utilities)	15%



Scenario 2: Cost Effective Package[2]

Installation Cost	$26,407
Potential Rebates & Incentives	$5,282
Annual Cost Savings	$6,332
Annual Energy Savings	Electricity: 43,018 kWh Natural Gas: 443 Therms
Greenhouse Gas Emission Savings	24 Tons
Simple Payback	3.3 Years
Site Energy Savings (all utilities)	6%



On-site Generation Potential

Photovoltaic	None
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

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

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Lifetime Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**34,584**	**13.9**	**-6**	**$4,724**	**$70,861**	**$20,567**	**$4,562**	**$16,005**	**3.4**	**34,121**
ECM 1	Install LED Fixtures	5,808	0.9	0	$802	$12,033	$4,714	$270	$4,444	5.5	5,848
ECM 2	Retrofit Fixtures with LED Lamps	28,776	13.0	-6	$3,922	$58,827	$15,853	$4,292	$11,561	2.9	28,273
Lighting Control Measures		**5,224**	**1.8**	**-1**	**$712**	**$5,696**	**$6,892**	**$670**	**$6,222**	**8.7**	**5,133**
ECM 3	Install Occupancy Sensor Lighting Controls	4,009	1.4	-1	$546	$4,371	$5,092	$670	$4,422	8.1	3,939
	Install High/Low Lighting Controls	1,215	0.4	0	$166	$1,325	$1,800	$0	$1,800	10.9	1,194
Electric Unitary HVAC Measures		**4,309**	**4.1**	**0**	**$595**	**$8,927**	**$25,992**	**$184**	**$25,808**	**43.4**	**4,339**
	Install High Efficiency Air Conditioning Units	4,309	4.1	0	$595	$8,927	$25,992	$184	$25,808	43.4	4,339
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**276**	**$2,425**	**$48,503**	**$65,591**	**$2,470**	**$63,121**	**26.0**	**32,260**
	Install High Efficiency Steam Boilers	0	0.0	276	$2,425	$48,503	$65,591	$2,470	$63,121	26.0	32,260
HVAC System Improvements		**2,813**	**0.0**	**20**	**$569**	**$6,257**	**$440**	**$0**	**$440**	**0.8**	**5,230**
ECM 4	Install Pipe Insulation	2,813	0.0	20	$569	$6,257	$440	$0	$440	0.8	5,230
Domestic Water Heating Upgrade		**0**	**0.0**	**33**	**$292**	**$3,144**	**$1,582**	**$600**	**$982**	**3.4**	**3,885**
	Install Tankless Water Heater	0	0.0	3	$22	$447	$1,503	$600	$903	40.4	297
ECM 5	Install Low-Flow DHW Devices	0	0.0	31	$270	$2,697	$79	$0	$79	0.3	3,588
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$223**	**$1,113**	**$230**	**$0**	**$230**	**1.0**	**1,623**
ECM 6	Vending Machine Control	1,612	0.2	0	$223	$1,113	$230	$50	$180	0.8	1,623
TOTALS		**48,541**	**20.0**	**322**	**$9,540**	**$144,501**	**$121,294**	**$8,486**	**$112,807**	**11.8**	**86,591**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

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

Figure 2 – Evaluated Energy Improvements

1.1 Planning Your Project

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

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

Pick Your Installation Approach

New Jersey Clean Energy Programs gives 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.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	x	x	
ECM 2	Retrofit Fixtures with LED Lamps	x	x	
ECM 3	Install Occupancy Sensor Lighting Controls	x	x	
ECM 4	Install Pipe Insulation		x	
ECM 5	Install Low-Flow Domestic Hot Water Devices		x	
ECM 6	Vending Machine Control	x	x	

Figure 3 – Funding Options

New Jersey Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified partner to develop your energy reduction plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

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 SmartStart 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 is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance 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. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

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

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

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

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

Ongoing Electric Savings with Demand Response

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

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Selover School (BOE Office). 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. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing 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 August 30, 2018, TRC performed an energy audit at Selover School (BOE Office) located in South Amboy, NJ. TRC met with Kenny to review the facility operations and help focus our investigation on specific energy-using systems.

Selover School (BOE Office) is a two-story, 36,153 square foot building built in 1952. Spaces include: administration offices, classrooms, a large warehouse storage, corridors, stairwells, and mechanical space. The building was originally a school building and has since been converted into the board of education office building. There are two classrooms used for pre-kindergarten and two classrooms used as higher education computer training for a local college. The remainder of the facility is used for office space or storage space. The building is 100% heated by a steam or hot water system and is about 80% cooled by split air-conditioning (AC) systems or window AC units.

Recent improvements include: A few classrooms were renovated which included the installation of new linear fluorescent T8 fixtures. Half of the building is heated by a hydronic system which was upgraded about five years ago and is served by a hot water boiler.

Facility concerns include: The original light fixtures are said to be old and dim. The half of the building that is heated by a steam system that has no controls and the boiler is old and inefficient. Unit ventilators are an issue and there are also electric service issues and plumbing issues. The roof is in poor condition.

2.2 Building Occupancy

The facility is occupied year-round on weekdays. Typical peak building occupancy includes about 60 students and 37 staff members. There are after hours cleaning until 7:00 PM. There are rare weekend activities.

Building Name	Weekday/Weekend	Operating Schedule
Board of Education Office	Weekday	6:30AM-5:00PM
	Weekend	Rare Use

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block with a stone or brick facade. The roof is flat and in poor condition. The walls are made of concrete masonry units (CMUs) with a brick decorative veneer. Windows are single or double pane with metal frames, clear glass and internal shading. The window frames are worn and showing evidence of excessive wear. Exterior doors are metal with metal frames and are in poor condition in the original areas of the building and in good condition in the renovated area of the building. Most doors have missing or worn weather-stripping materials. Degraded window and door seals increase drafts and outside air infiltration.

Building Façade – Old Entrance

Window Frame Caulk in Poor Condition

Building Façade – New Entrance

Building Envelope Deficiencies

Exterior Door with no Weather-Stripping

Exterior Door with no Weather-Stripping

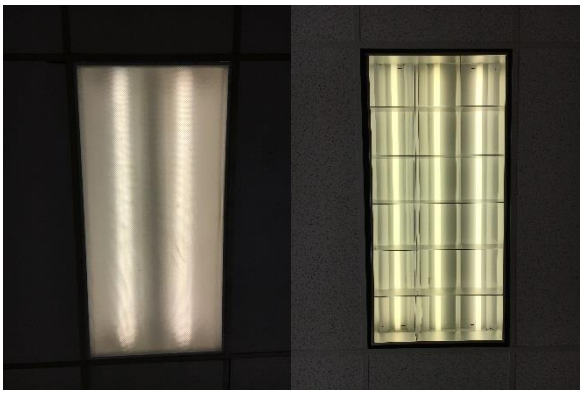
2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. Fixture types include 2- 3- or 4-lamp, 2- or 4-foot long recessed troffer and surface or pendant mounted wrap fixtures. The hallway fixtures that are 1-lamp wrap fixtures are in fair condition, but lenses are yellowing which has contributed to reduced light levels in this area. The remainder of light fixtures on the main floor are in good condition. Light fixtures in the basement areas are in poor condition, however majority of this space is unused storage and therefore lighting is seldom used. The old gymnasium/multipurpose room has been converted to warehouse storage space with an office area. This space is lit by 4-lamp T8 fixtures and are manually controlled. There are a total of eight rooms that are offices, storage rooms or classrooms which have been renovated with 3-lamp recessed troffer fixtures with parabolic lenses that are in good condition and are controlled by occupancy based sensors. The remainder of the building light fixtures are manually controlled via wall switches. Exit signs are LED.

Interior lighting levels were generally sufficient with the exception of some rooms which, based on their current activities, are over lit. These rooms are lit by 3-lamp fixtures, controlled by occupancy sensors or 4-lamp fixtures with inboard/outboard bi-level switching. During the energy audit, the following light levels, in footcandles (FC), were taken:

- Storage Room with 9 fixtures, 3 Lamp – 40 FC
- Office Room with 9 fixtures, 3 Lamp – 40 FC
- Classroom with 9 fixtures, 3 Lamp – 40 FC
- Office Room with 4 fixtures, 4-lamp – 65 FC

The minimum light levels required for classroom and office space by IES standards is 30 FC and for storage rooms is 5-20 FC. However, additional considerations must be investigated during design to determine the cost effectiveness of reducing the number of lamps. With bi-level switching, it is uncertain as to how often these fixtures operate at each level of switching (number of lamps). Reducing the light output would require a level of design, beyond the scope of this energy audit, to determine the feasibility. Options may include upgrading to 1-LED lamp fixtures, 2x4 LED retrofit kits, changing the number of fixtures, etc. The options range too much to provide an analysis and cost would vary drastically on the proposed approach. We recommend that this be investigated further by an electrical contractor if lighting upgrades move forward to implementation.



Linear Fluorescent T8 Fixtures

Hallway Lighting

Parabolic Lensed Recessed Troffer Fixtures

Pendant Mounted Wrap Fixtures

Original Multipurpose Room Box Fixtures

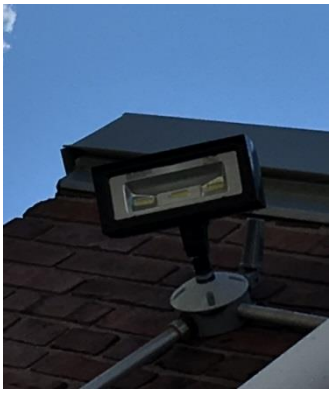
Manual Wall Switch

Occupancy Based Sensor

Manual Wall Switches

Exterior fixtures include wall-mounted and pole-mounted flood fixtures which are either high pressure sodium or metal halide lamp fixtures. There is also a new LED flood fixture. Fixtures are in fair to good condition. Exterior light fixtures are controlled by a time clock set from 7:00 PM to 7:00 AM, every day or a photocell, depending on the fixture.

HID Flood Fixture



LED Flood Fixture

HID Flood Fixture

Timeclock

2.5 Air Handling Systems

Unit Ventilators

The unit ventilators have 1/4 HP supply fan motors, electronically-controlled outside air dampers and hot water coils. This system is original to the building and appears to be in poor operating condition. The newer unit ventilators have 1/6 HP supply fan motors, controlled outside air dampers and zone valves that operate with the building energy management system (EMS). These unit ventilators are equipped with economizers. This system appears to be in fair operating condition.

Old Unit Ventilator (UV)

Manual Dial Thermostats

Split Heat Pump Systems

The conference room is conditioned by a Mitsubishi (Model MUZ-D36NA) high efficiency split-system air-source heat pump which is in good condition. The system is 3 tons in cooling capacity and 50 MBH in heating capacity. It is remote controlled by occupants in the space and primarily used for cooling.

Split HP System – Outdoor Condensing Unit

Split Air Conditioning (AC) Systems

Two offices are cooled by split AC systems. The outdoor condensing units are located on the roof. The Goodman (Model CK24-1B) is a 2-ton system, standard efficiency, in poor condition and beyond its useful life. The Pridiom (Model POM365HXX) is a 3-ton system, high efficiency and in good condition. They are manually remotely controlled by occupants.

Split AC System – Outdoor Condensing Units

Split AC System – Indoor Unit

Air Conditioners

Classrooms and offices throughout the building are cooled by window AC units which vary in condition. They range in size between 1 -2 tons and range in efficiency between 8.5 EER and 10.7 EER. Most appear to be permanently installed through the existing windows and not removed during the winter months. We would recommend using thermally insulated window AC unit sleeves in the winter months to reduce the heating load.

Window AC Unit

Window AC Unit

Window AC Unit in Poor Condition

Window AC Unit

2.6 Heating Hot Water/Steam Systems

There are two heating systems at this facility. The hydronic heating system is heated by a non-condensing Weil McLain (Model: 1280) 1348 MBH hot water boiler that is in fair condition and within its useful life. The burners are non-modulating with a nominal efficiency of 81%. The hydronic distribution system is a 2-pipe heating only system. The boiler, hot water pumps, motors, variable frequency drives (VFDs) were installed in 2005 and in good condition. They are configured in a variable flow primary distribution with two 3 HP variable frequency drive (VFD)- controlled hot water pumps operating with a lead/lag control scheme. The boiler provides hot water to fin tube radiators and unit ventilators on the main floor of the building. The hot water supply temperature is on an outdoor air reset schedule.

Non-Condensing Hot Water Boiler

Boiler Burner

New Hot Water Pumps and Motors

Variable Frequency Drives

The steam system is heated by a HB Smith (unknown model) 3529 MBH steam boiler that is in poor condition and past its useful life. The boiler is original to the building installed in 1979. The condensate return water pumps and motors are fractional horsepower and in good condition. Steam is provided to building heating terminals in the basement areas and the original unit ventilators on the main floor of the building.

Steam Boiler

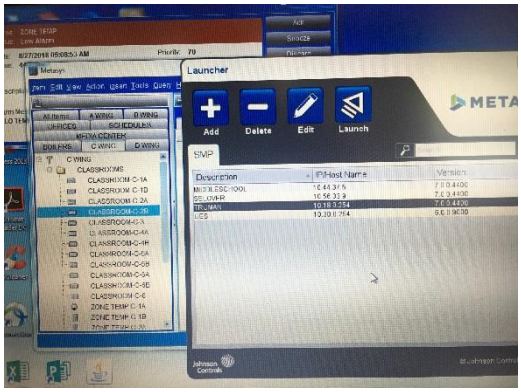
Boiler Burner

Condensate Return Pump Motors

Basement Radiator

2.7 Building Energy Management Systems (EMS)

A Johnson Controls Metasys EMS manages the hot water system serving the main floor of the building. The EMS provides equipment scheduling control and monitors and controls space temperatures and heating water loop temperatures.



EMS Laptop Interface

Manual Dial Thermostat

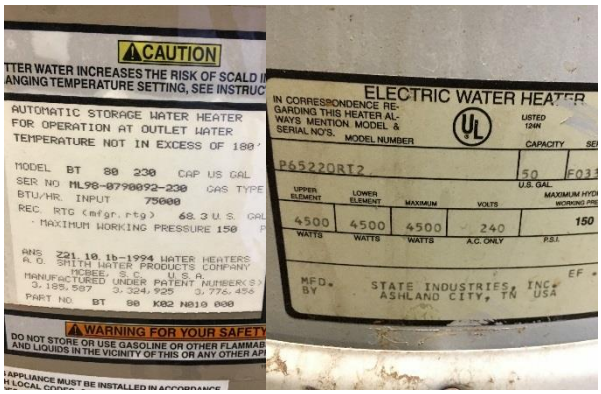
2.8 Domestic Hot Water

Domestic hot water is generated by one of three hot water heaters, depending on the building space:

- One 50-gallon American Water Heater (Model BFG12250T403NOV) 40 MBH gas-fired storage tank water heater serves a portion of the restrooms and is operating beyond its expected useful life. This water heater is located in the main floor boiler room. For the purposes of this analysis, we estimated an efficiency of 72% due to its age. A fractional horsepower pump and motor distribute hot water to hand washing sinks throughout the building. The domestic hot water piping is properly insulated.
- One 50-gallon State Industries (Model P65220RT2) 4.5 kW electric storage tank water heater is located in the basement boiler room and operating past its expected useful life. Fractional horsepower pumps and motors distribute hot water to hand washing sinks throughout the building. The domestic hot water piping is missing insulation in this basement boiler room.
- One 75-gallon A.O. Smith (Model BT 80 230) 75 MBH gas-fired storage tank water heater is also located in the basement boiler room and operating past its expected useful life. Fractional horsepower pumps and motors distribute hot water to hand washing sinks throughout the building. The domestic hot water piping is missing insulation in this basement boiler room.

Storage Tank Water Heater & Tank Temperature Dial

High Flow Faucet Aerator



Basement Water Heater Nameplates

Basement Boiler Room - Uninsulated Piping

2.9 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 1.61% percent of total building energy use. This is lower than a typical building. You seem to already be doing a great job managing your electrical plug loads. This report makes additional suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are approximately 36 computer work stations and 24 laptops throughout the facility. Plug loads throughout the building include general café and office equipment. There are office typical loads such as fans and printers. There are several residential style refrigerators throughout the building that vary in condition and efficiency. There is a refrigerated beverage vending machine in the lounge that is not equipped with occupancy-based controls.

Laptop Cart

Residential Refrigerators and Vending Machine

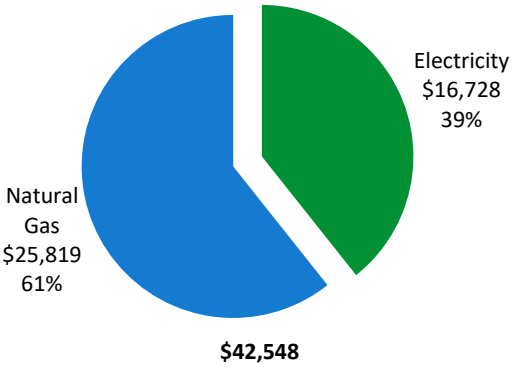
2.10 Water-Using Systems

There are restrooms with toilets, urinals, and sinks. Faucet flow rates are at 2.0 gallons per minute (gpm) or higher.

3 Energy Use and Costs

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

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	121,108 kWh	$16,728
Natural Gas	29,333 Therms	$25,819
Total		**$42,548**



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

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

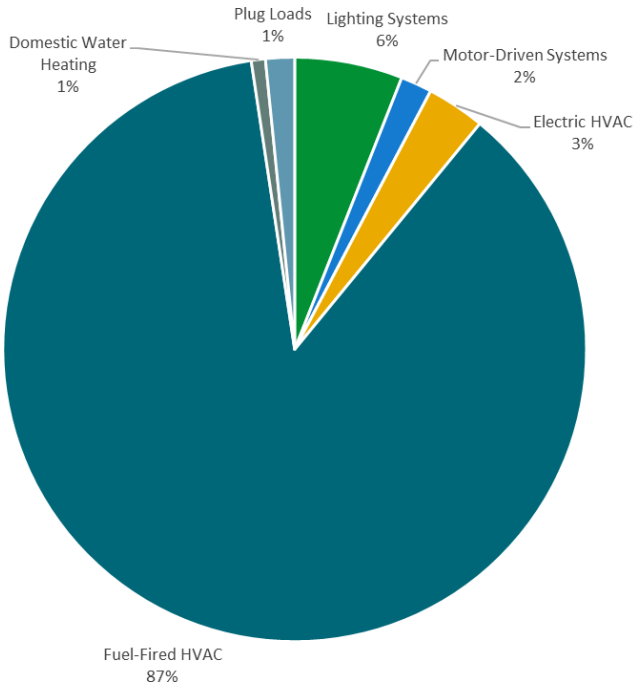
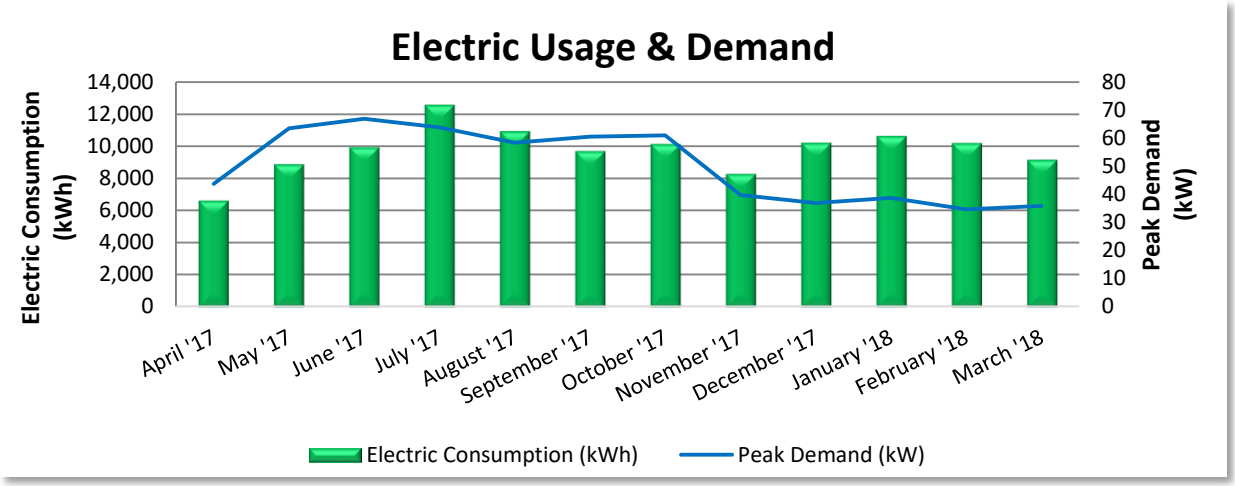


Figure 5 - Energy Balance

3.1 Electricity

JCP&L supplies and delivers electricity under rate class General Service Secondary 3 Phase.



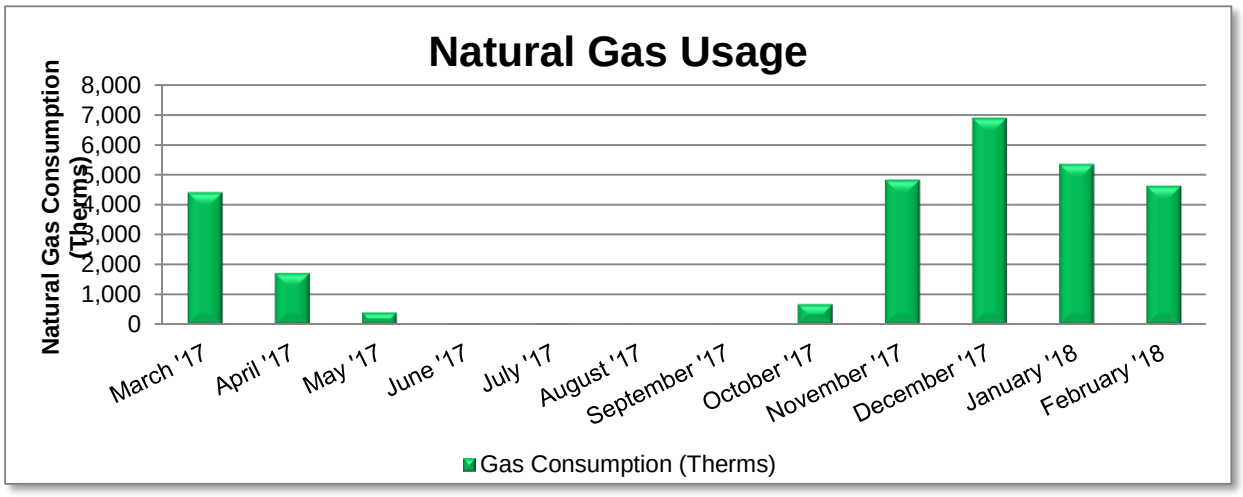
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
4/18/17	27	6,626	44	$197	$1,108
5/19/17	30	8,864	64	$288	$1,327
6/21/17	32	9,918	67	$333	$1,499
7/21/17	29	12,552	64	$292	$1,519
8/22/17	31	10,917	58	$273	$1,516
9/21/17	29	9,680	61	$288	$1,430
10/23/17	31	10,128	61	$271	$1,426
11/18/17	25	8,268	40	$202	$1,166
12/20/17	31	10,214	37	$211	$1,368
1/22/18	32	10,625	39	$225	$1,346
2/20/18	28	10,191	35	$208	$1,288
3/21/18	28	9,143	36	$204	$1,184
Totals	**353**	**117,126**	**67**	**$2,992**	**$16,178**
Annual	**365**	**121,108**	**67**	**$3,093**	**$16,728**

Notes:

- Peak demand of 67 kW occurred in July 2017.
- The average electric cost over the past 12 months was $0.138/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

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



Gas Billing Data				
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**	**TRC Estimated Usage?**
4/6/17	29	4,406	$2,946	Yes
5/8/17	32	1,713	$1,279	No
6/6/17	29	394	$463	No
7/7/17	31	46	$258	No
8/7/17	30	45	$254	No
9/6/17	29	35	$279	No
10/5/17	28	40	$299	No
11/3/17	28	678	$833	No
12/6/17	33	4,823	$4,128	No
1/9/18	34	6,878	$5,204	No
2/6/18	28	5,342	$5,067	No
3/8/18	30	4,613	$4,527	No
Totals	**361**	**29,012**	**$25,536**	
Annual	**365**	**29,333**	**$25,819**	

Notes:

- The average gas cost for the past 12 months is $0.880/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

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

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

Benchmarking Score	**N/A**

Due to its unique characteristics, this building type is not able to receive a benchmarking score. This report contains suggestions about how to improve building performance and reduce energy costs.

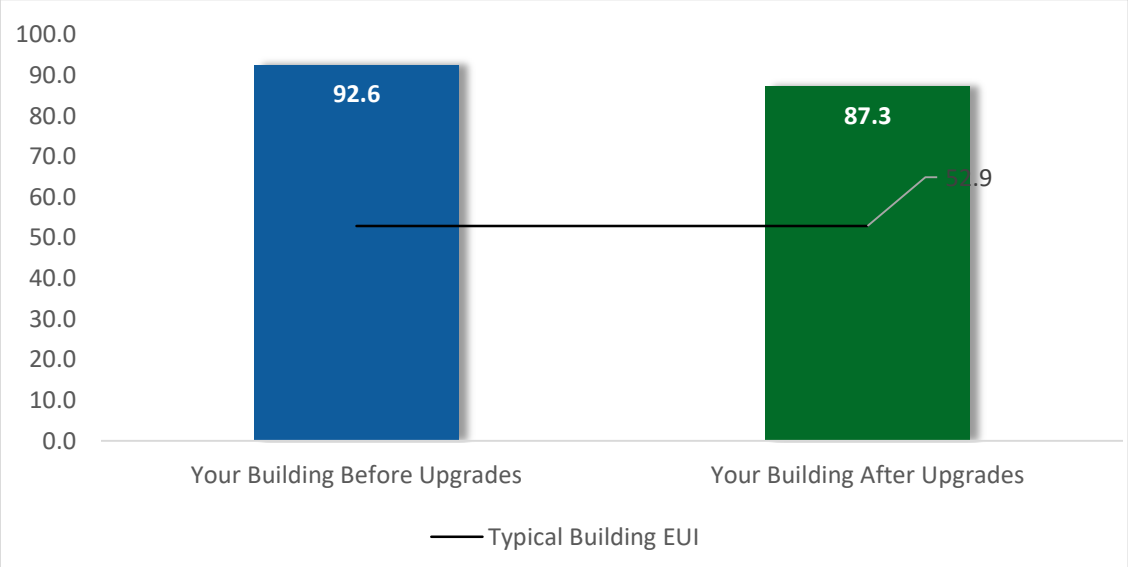


Figure 6 - Energy Use Intensity Comparison

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

Tracking Your Energy Performance

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

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

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training. For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

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

4 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. 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 Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

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

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

Appendix A: Equipment Inventory & Recommendations provides a detailed list of the locations and recommended upgrades for each energy conservation measure.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Lifetime Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**34,584**	**13.9**	**-6**	**$4,724**	**$70,861**	**$20,567**	**$4,562**	**$16,005**	**3.4**	**34,121**
ECM 1	Install LED Fixtures	5,808	0.9	0	$802	$12,033	$4,714	$270	$4,444	5.5	5,848
ECM 2	Retrofit Fixtures with LED Lamps	28,776	13.0	-6	$3,922	$58,827	$15,853	$4,292	$11,561	2.9	28,273
Lighting Control Measures		**5,224**	**1.8**	**-1**	**$712**	**$5,696**	**$6,892**	**$670**	**$6,222**	**8.7**	**5,133**
ECM 3	Install Occupancy Sensor Lighting Controls	4,009	1.4	-1	$546	$4,371	$5,092	$670	$4,422	8.1	3,939
	Install High/Low Lighting Controls	1,215	0.4	0	$166	$1,325	$1,800	$0	$1,800	10.9	1,194
Electric Unitary HVAC Measures		**4,309**	**4.1**	**0**	**$595**	**$8,927**	**$25,992**	**$184**	**$25,808**	**43.4**	**4,339**
	Install High Efficiency Air Conditioning Units	4,309	4.1	0	$595	$8,927	$25,992	$184	$25,808	43.4	4,339
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**276**	**$2,425**	**$48,503**	**$65,591**	**$2,470**	**$63,121**	**26.0**	**32,260**
	Install High Efficiency Steam Boilers	0	0.0	276	$2,425	$48,503	$65,591	$2,470	$63,121	26.0	32,260
HVAC System Improvements		**2,813**	**0.0**	**20**	**$569**	**$6,257**	**$440**	**$0**	**$440**	**0.8**	**5,230**
ECM 4	Install Pipe Insulation	2,813	0.0	20	$569	$6,257	$440	$0	$440	0.8	5,230
Domestic Water Heating Upgrade		**0**	**0.0**	**33**	**$292**	**$3,144**	**$1,582**	**$600**	**$982**	**3.4**	**3,885**
	Install Tankless Water Heater	0	0.0	3	$22	$447	$1,503	$600	$903	40.4	297
ECM 5	Install Low-Flow DHW Devices	0	0.0	31	$270	$2,697	$79	$0	$79	0.3	3,588
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$223**	**$1,113**	**$230**	**$0**	**$230**	**1.0**	**1,623**
ECM 6	Vending Machine Control	1,612	0.2	0	$223	$1,113	$230	$50	$180	0.8	1,623
TOTALS		**48,541**	**20.0**	**322**	**$9,540**	**$144,501**	**$121,294**	**$8,486**	**$112,807**	**11.8**	**86,591**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

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

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**34,584**	**13.9**	**-6**	**$4,724**	**$20,567**	**$4,562**	**$16,005**	**3.4**	**34,121**
ECM 1	Install LED Fixtures	5,808	0.9	0	$802	$4,714	$270	$4,444	5.5	5,848
ECM 2	Retrofit Fixtures with LED Lamps	28,776	13.0	-6	$3,922	$15,853	$4,292	$11,561	2.9	28,273
Lighting Control Measures		**4,009**	**1.4**	**-1**	**$546**	**$5,092**	**$670**	**$4,422**	**8.1**	**3,939**
ECM 3	Install Occupancy Sensor Lighting Controls	4,009	1.4	-1	$546	$5,092	$670	$4,422	8.1	3,939
HVAC System Improvements		**2,813**	**0.0**	**20**	**$569**	**$440**	**$0**	**$440**	**0.8**	**5,230**
ECM 4	Install Pipe Insulation	2,813	0.0	20	$569	$440	$0	$440	0.8	5,230
Domestic Water Heating Upgrade		**0**	**0.0**	**31**	**$270**	**$79**	**$0**	**$79**	**0.3**	**3,588**
ECM 5	Install Low-Flow DHW Devices	0	0.0	31	$270	$79	$0	$79	0.3	3,588
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$223**	**$230**	**$50**	**$180**	**0.8**	**1,623**
ECM 6	Vending Machine Control	1,612	0.2	0	$223	$230	$50	$180	0.8	1,623
TOTALS		**43,018**	**15.5**	**44**	**$6,332**	**$26,407**	**$5,282**	**$21,125**	**3.3**	**48,501**

Figure 8 – 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 ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**34,584**	**13.9**	**-6**	**$4,724**	**$20,567**	**$4,562**	**$16,005**	**3.4**	**34,121**
ECM 1	Install LED Fixtures	5,808	0.9	0	$802	$4,714	$270	$4,444	5.5	5,848
ECM 2	Retrofit Fixtures with LED Lamps	28,776	13.0	-6	$3,922	$15,853	$4,292	$11,561	2.9	28,273

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

ECM 1: Install LED Fixtures

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

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

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

Affected building areas: exterior fixtures

ECM 2: Retrofit Fixtures with LED Lamps

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

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

Affected building areas: all areas with fluorescent fixtures with T8 tubes

Considerations/Sensitivities: light levels were over lit in some classrooms, offices and storage rooms**.** Over lit rooms that are only recommended for re-lamping as part of this measure may still have an opportunity for greater savings than replacing the lamps one-for-one. The classroom and storage room light levels were on average 40 FC and office rooms were 40-65 FC. The minimum light levels required for classroom and office space by IES standards is 30 FC and for storage rooms is 5-20 FC. However, it is unsure if each room will continue to be used as storage, office or classroom space. However, additional considerations must be investigated during design to determine the cost effectiveness of reducing the number of lamps. Reducing the light output would require a level of design, beyond the scope of this energy audit, to determine the feasibility. Options may include upgrading to 1-LED lamp fixtures, 2x4 LED retrofit kits, changing the number of fixtures, etc. The options range too much to provide an analysis and cost would vary drastically on the proposed approach. We recommend that this be investigated further by an electrical contractor if lighting upgrades move forward to implementation.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**5,224**	**1.8**	**-1**	**$712**	**$6,892**	**$670**	**$6,222**	**8.7**	**5,133**
ECM 3	Install Occupancy Sensor Lighting Controls	4,009	1.4	-1	$546	$5,092	$670	$4,422	8.1	3,939
	Install High/Low Lighting Controls	1,215	0.4	0	$166	$1,800	$0	$1,800	10.9	1,194

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 lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

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

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

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

Affected building areas: offices, conference rooms and lounge

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 requirements. 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.

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

Affected building areas: hallways

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

Reasons for not Recommending as a High Priority Measure: The projected payback period for this measure based on the energy savings exceeds the expected useful life of the replacement equipment. The upgrade to high efficiency is not justified by energy savings alone.

Considerations: If the school district moves forward toward implementation of a comprehensive project under the ESIP we would recommend including this measure.

4.3 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**4,309**	**4.1**	**0**	**$595**	**$25,992**	**$184**	**$25,808**	**43.4**	**4,339**
	Install High Efficiency Air Conditioning Units	4,309	4.1	0	$595	$25,992	$184	$25,808	43.4	4,339

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

Install High Efficiency Air Conditioning Units

Replace standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. This includes window AC units and the split AC system that are beyond their useful life, in poor condition and of low efficiency. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling load, and the estimated annual operating hours.

Sensitivities: These window AC unit replacements would affect the building envelope as the existing windows which are also in poor condition are currently customized for the AC units. Based on the condition of the building envelope, it would be advantageous to replace windows and frames along with upgrading the building cooling equipment as a comprehensive energy saving project. However, additional considerations must be investigated during design to determine the cost effectiveness of such improvements. This would require a level of design, beyond the scope of this energy audit, to determine the feasibility. We recommend that this be investigated further by a qualified contractor if upgrades move forward to implementation.

Reasons for not Recommending as a High Priority Measure: The projected payback period for this measure based on the energy savings exceeds the expected useful life of the replacement equipment. The upgrade to high efficiency is not justified by energy savings alone.

Considerations: If the school district moves forward toward implementation of a comprehensive project under the ESIP, we would recommend including this measure.

4.4 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**276**	**$2,425**	**$65,591**	**$2,470**	**$63,121**	**26.0**	**32,260**
	Install High Efficiency Steam Boilers	0	0.0	276	$2,425	$65,591	$2,470	$63,121	26.0	32,260

Install High Efficiency Steam Boilers

Replace older inefficient steam boilers with high efficiency steam boilers. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

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

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

Sensitivities: Replacing the steam boiler is one of several options available. However, these additional options would impact the terminal units associated with the steam heating system and have a much greater upfront cost than the boiler replacement costs associated with this measure. The steam system could be upgraded to hot water, abandoned in place with new high efficiency heat pump systems or new gas-fired roof top units installed. However, additional considerations must be investigated to determine the cost effectiveness of such improvements. This would require a level of design, beyond the scope of this energy audit, to determine the feasibility. We recommend that this be investigated further by a mechanical contractor if upgrades move forward to implementation.

Considerations: If the school district moves forward toward implementation of a comprehensive project under the ESIP, we would recommend including this measure.

4.5 HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**2,813**	**0.0**	**20**	**$569**	**$440**	**$0**	**$440**	**0.8**	**5,230**
ECM 4	Install Pipe Insulation	2,813	0.0	20	$569	$440	$0	$440	0.8	5,230

ECM 4: Install Pipe Insulation

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

Affected building areas: all exposed pipes

4.6 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**33**	**$292**	**$1,582**	**$600**	**$982**	**3.4**	**3,885**
	Install Tankless Water Heater	0	0.0	3	$22	$1,503	$600	$903	40.4	297
ECM 5	Install Low-Flow DHW Devices	0	0.0	31	$270	$79	$0	$79	0.3	3,588

Install Tankless Water Heater

Replace the existing tank water heater with a tankless water heating system. Tankless water heaters (a.k.a. “on-demand water heaters”) only heat water when hot water is needed. Water is heated as it flows through the pipe to the hot water tap. Energy savings from a tankless water heater are based on eliminating heat losses associated with maintaining unnecessary standby hot water capacity.

Reasons for not Recommending as a High Priority Measure: The projected payback period for this measure based on the energy savings exceeds the expected useful life of the replacement equipment. The upgrade to high efficiency is not justified by energy savings alone.

Considerations: If the school district moves forward toward implementation of a comprehensive project under the ESIP, we would recommend including this measure.

ECM 5: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The existing high flow aerators on hand washing sink faucets are recommended to be replaced with low flow devices rated for 0.5 gpm. Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing. Additional cost savings may result from reduced water usage.

Affected building areas: all faucets within facility

4.7 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$223**	**$230**	**$0**	**$230**	**1.0**	**1,623**
ECM 6	Vending Machine Control	1,612	0.2	0	$223	$230	$50	$180	0.8	1,623

ECM 6: Vending Machine Control

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

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

Energy Tracking with ENERGY STAR® Portfolio Manager®

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

Weatherization

Caulk or weather strip leaky doors and windows to reduce drafts and loss of heated or cooled air. Sealing cracks and openings can reduce heating and cooling costs, improve building durability, and create a healthier indoor environment.

Doors and Windows

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

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.

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.

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

Motor Maintenance

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

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.

Destratification Fans

For areas with high ceilings, destratification fans f air balance the air temperature from floor to ceiling. They help reduce the recovery time needed to warm the space after nightly temperature setbacks and will increase occupants' the comfort level.

Areas with high ceilings require the heating system to heat a larger volume of space than that which is occupied. As the warm air rises, the warmest space is at the ceiling level, rather than floor level. Higher temperatures at the ceiling accelerate heat loss through the roof, which requires additional energy consumption by the heating equipment to compensate for this accelerated heat transfer.

Economizer Maintenance

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

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

Steam Trap Repair and Replacement

Steam traps are a crucial part of delivering heat from the boiler to the space heating units. Repair of replace traps that are blocked or allowing steam to pass. Inspect steam traps as part of a regular steam system maintenance plan.

Boiler Maintenance

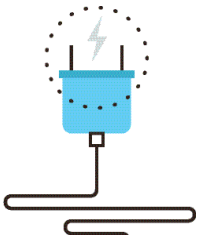
Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is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

Water Heater Maintenance

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.

Plug Load Controls



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

[5] For additional information refer to "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

Computer Power Management Software

Many computers consume power during nights, weekends, and holidays. Screen savers are commonly confused as a power management strategy. This contributes to avoidable, excessive electrical energy consumption. There are innovative power management software packages available that are designed to deliver significant energy saving and provide ongoing tracking measurements. A central power management platform helps enforce energy savings policies as well as identify and eliminate underutilized devices

Water Conservation

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

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

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

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

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

Procurement Strategies

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

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

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

6 On-site Generation

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

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

6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC 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 **no** potential for installing a PV array.

This facility does appear not to meet the minimum criteria for a cost-effective solar PV installation due to the electric demand but can be further explored with a solar contractor.

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.

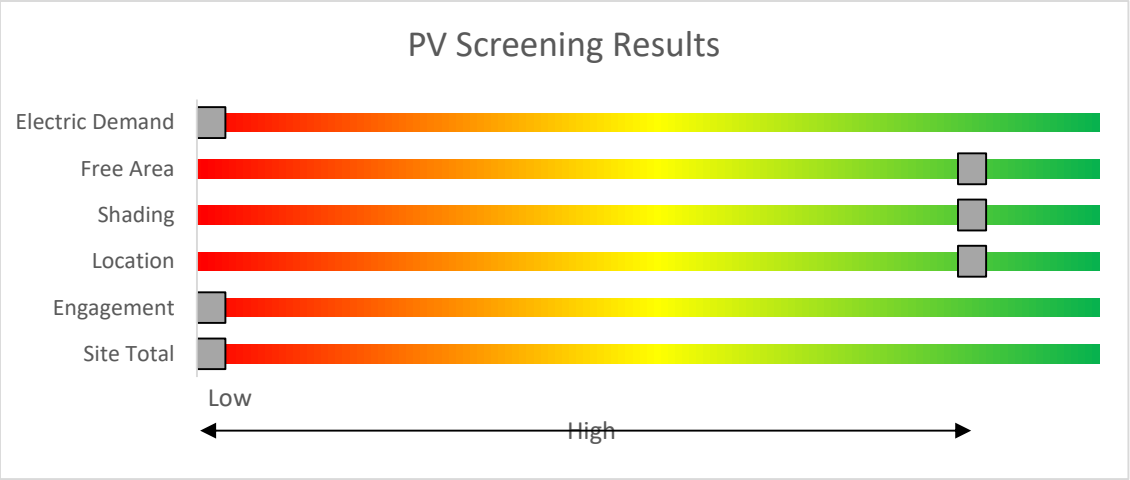


Figure 9 - Photovoltaic Screening

6.2 Combined Heat and Power

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

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

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

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

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

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

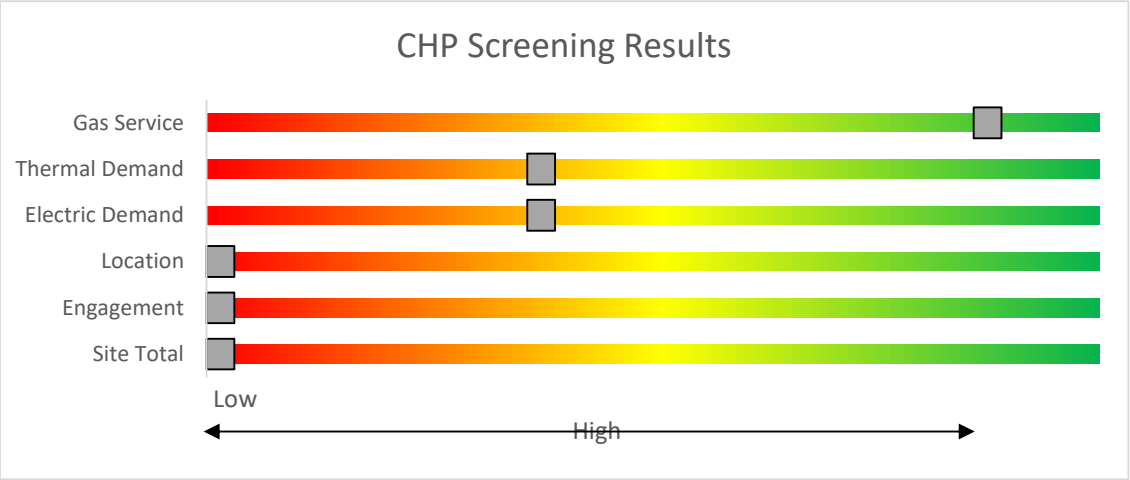


Figure 10 - Combined Heat and Power Screening

7 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? New Jersey Clean Energy Programs can help. Pick the program that works best for you. Incentive programs that may apply to this facility are identified in the Executive Summary. This section provides an overview of currently available in New Jersey Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.
Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.			

7.1 SmartStart

SmartStart 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.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficiency equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 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 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, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. 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 program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the 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 (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

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

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

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

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

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

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

8.2 Retail Natural Gas Supply Options

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

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

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

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

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

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

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Main Hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,730	2, NR	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,884	0.5	1,702	0	$232	$893	$135	3.3
Main Hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, NR	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,884	0.4	1,135	0	$155	$529	$90	2.8
Main Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,884	0.2	757	0	$103	$489	$95	3.8
Copy Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,884	0.2	504	0	$69	$262	$60	2.9
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,365	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,365	0.0	26	0	$4	$18	$5	3.7
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	S	22	1,365	2	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	1,365	0.0	20	0	$3	$16	$3	4.8
Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	S	22	500	2	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	500	0.0	7	0	$1	$16	$3	13.1
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,730	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.2	757	0	$103	$335	$80	2.5
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,365	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,365	0.0	24	0	$3	$33	$6	8.1
Classroom #23	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,884	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.6	1,231	0	$168	$657	$180	2.8
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,365	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,365	0.1	149	0	$20	$110	$30	3.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,365	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,365	0.0	24	0	$3	$33	$6	8.1
Classroom #14	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,884	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.6	1,231	0	$168	$657	$180	2.8
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	500	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	500	0.1	54	0	$7	$110	$30	10.7
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,365	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,365	0.0	24	0	$3	$33	$6	8.1
Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, NR	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,884	0.2	630	0	$86	$383	$50	3.9
Boiler Room #1	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,365	2	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,365	0.2	336	0	$46	$292	$80	4.6
Storage Room #20	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	O	93	942	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	942	0.4	462	0	$63	$493	$135	5.7
Office Room #19	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,884	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.4	923	0	$126	$493	$135	2.8
Classroom #18	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,884	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.4	923	0	$126	$493	$135	2.8
Office Room #17	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,884	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.4	923	0	$126	$493	$135	2.8
Office Room #16	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,730	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.5	1,702	0	$232	$763	$170	2.6
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,365	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,365	0.0	26	0	$4	$18	$5	3.7
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,365	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,365	0.0	53	0	$7	$37	$10	3.7
Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,365	2, 3	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	942	0.2	333	0	$45	$489	$95	8.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Storage Room #15	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	942	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	942	0.6	615	0	$84	$657	$180	5.7
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,365	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,365	0.1	149	0	$20	$110	$30	3.9
Classroom #22	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	942	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	942	0.6	615	0	$84	$657	$180	5.7
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,365	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,365	0.1	149	0	$20	$110	$30	3.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,365	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,365	0.0	24	0	$3	$33	$6	8.1
Server Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,365	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,365	0.1	99	0	$14	$73	$20	3.9
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	500	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	500	0.0	10	0	$1	$18	$5	10.1
Entry	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,730	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,730	0.0	53	0	$7	$18	$5	1.9
Hallway	35	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,730	2, NR	Relamp	Yes	35	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,884	0.7	2,312	0	$315	$1,639	$175	4.6
Office Room #11	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	O	114	2,730	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,884	0.3	889	0	$121	$562	$115	3.7
Office Room #12	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,884	0.5	1,513	0	$206	$708	$155	2.7
Conference Room	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,365	2, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	942	0.6	1,009	0	$137	$854	$195	4.8
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,884	0.1	378	0	$52	$380	$65	6.1
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,884	0.2	504	0	$69	$416	$75	5.0
Office Room #10	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,884	0.5	1,513	0	$206	$708	$155	2.7
Office Room #9	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,730	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,884	0.5	1,513	0	$206	$708	$155	2.7
Office Room #8	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,730	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,884	0.3	889	0	$121	$562	$115	3.7
Office Room #8	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,730	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,884	0.3	889	0	$121	$562	$115	3.7
Closets (4 Total)	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	500	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	500	0.1	35	0	$5	$130	$24	22.1
Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,365	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	942	0.2	284	0	$39	$434	$80	9.2
Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,365	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	942	0.2	284	0	$39	$434	$80	9.2
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,730	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,730	0.0	105	0	$14	$37	$10	1.9
Office Room #5	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,730	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.7	2,270	0	$309	$927	$215	2.3
Lounge Hallway	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	2,730	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,730	0.1	192	0	$26	$130	$24	4.0
Lounge	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,365	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	942	0.2	252	0	$34	$416	$75	9.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,365	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,365	0.0	24	0	$3	$33	$6	8.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,365	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,365	0.0	24	0	$3	$33	$6	8.1
Office Room #6	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,730	2, 3	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.4	1,135	0	$155	$599	$125	3.1
Office Room #6	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,730	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,884	0.3	946	0	$129	$544	$110	3.4
Stairwell	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,730	2	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,730	0.1	263	0	$36	$91	$25	1.9
Basement Hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,000	2	Relamp	No	9	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,000	0.1	173	0	$24	$164	$45	5.1
Boiler Room #2	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	500	2	Relamp	No	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	500	0.2	92	0	$13	$219	$60	12.6
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,000	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.1	73	0	$10	$73	$20	5.4
Low Use Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	250	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	250	0.0	9	0	$1	$37	$10	21.4
Low Use Storage	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	250	2	Relamp	No	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	250	0.4	123	0	$17	$584	$160	25.3
Low Use Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	250	2	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	250	0.2	62	0	$8	$292	$80	25.3
Office/Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	500	2	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	500	0.1	62	0	$8	$146	$40	12.6
Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	250	2	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	250	0.0	9	0	$1	$65	$12	44.2
Custodial Office/Garage	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,365	2	Relamp	No	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,365	0.3	505	0	$69	$438	$120	4.6
Transition Spaces	10	Exit Signs: LED - 2 W Lamp	None	S	6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Exterior	2	High-Pressure Sodium: (1) 70W Lamp	Photocell	S	95	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Other	Photocell	29	4,380	0.1	578	0	$80	$397	$10	4.9
Exterior	2	Metal Halide: (1) 400W Lamp	Timeclock	S	458	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	137	4,380	0.4	2,812	0	$388	$1,932	$200	4.5
Exterior	12	High-Pressure Sodium: (1) 50W Lamp	Timeclock	S	66	4,380	1	Fixture Replacement	No	12	LED - Fixtures: Other	Timeclock	20	4,380	0.4	2,418	0	$334	$2,385	$60	7.0

Motor Inventory & Recommendations

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Hydronic Heating	1	Heating Hot Water Pump	3.0	89.5%	Yes	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Hydronic Heating	1	Heating Hot Water Pump	3.0	89.5%	Yes	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Unit Ventilators	Unit Ventilators	9	Supply Fan	0.3	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Condensate Return	2	Condensate Pump	0.3	74.0%	No	B	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Burner	1	Other	1.0	85.5%	No	W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Domestic Hot Water	2	Water Supply Pump	0.2	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Domestic Hot Water	1	Water Supply Pump	0.1	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Offices & Classrooms	Offices & Classrooms	2	Window AC	1.26		W		No							0.0	0	0	$0	$0	$0	0.0
Offices & Classrooms	Offices & Classrooms	1	Window AC	1.25		B	NR	Yes	1	Window AC	1.25		12.00		0.2	174	0	$24	$1,361	$0	56.5
Offices & Classrooms	Offices & Classrooms	2	Window AC	1.25		B	NR	Yes	2	Window AC	1.25		12.00		0.5	546	0	$75	$2,722	$0	36.1
Offices & Classrooms	Offices & Classrooms	2	Window AC	2.00		B	NR	Yes	2	Window AC	2.00		12.00		0.5	558	0	$77	$4,355	$0	56.5
Offices & Classrooms	Offices & Classrooms	2	Window AC	2.00		B	NR	Yes	2	Window AC	2.00		12.00		0.8	873	0	$121	$4,355	$0	36.1
Offices & Classrooms	Offices & Classrooms	4	Window AC	1.54		W		No							0.0	0	0	$0	$0	$0	0.0
Offices & Classrooms	Offices & Classrooms	5	Window AC	1.54		B	NR	Yes	5	Window AC	1.54		12.00		1.3	1,362	0	$188	$8,393	$0	44.6
Offices & Classrooms	Offices & Classrooms	2	Window AC	0.83		B	NR	Yes	2	Window AC	0.83		12.00		0.3	364	0	$50	$1,815	$0	36.1
Outdoors	Offices & Classrooms	1	Split-System Air-Source HP	3.00	50.00	W		No							0.0	0	0	$0	$0	$0	0.0
Outdoors	Offices & Classrooms	1	Split-System AC	2.00		B	NR	Yes	1	Split-System AC	2.00		14.00		0.4	431	0	$59	$2,992	$184	47.2
Outdoors	Offices & Classrooms	1	Split-System AC	3.00		W		No							0.0	0	0	$0	$0	$0	0.0

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room #1	Hydronic Heating	1	Non-Condensing Hot Water Boiler	######	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler Room #2	Steam Heating	1	Induced Draft Steam Boiler	######	B	NR	Yes	1	Natural Draft Steam Boiler	######	79.00%	Et	0.0	0	276	$2,425	$65,591	$2,470	26.0

Pipe Insulation Recommendations

Location	Area(s)/System(s) Affected	Recommendation Inputs			Energy Impact & Financial Analysis						
		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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room #2	Domestic Hot Water	4	25	1.00	0.0	2,813	0	$389	$220	$0	0.6
Boiler Room #2	Domestic Hot Water	4	25	2.00	0.0	0	20	$180	$220	$0	1.2

DHW Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
		System Quantity	System Type	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room #1	Domestic Hot Water	1	Storage Tank Water Heater (≤ 50 Gal)	B	NR	Yes	1	Tankless Water Heater	Natural Gas	82.00%	EF	0.0	0	1	$11	$523	$300	19.9
Boiler Room #2	Domestic Hot Water	1	Storage Tank Water Heater (≤ 50 Gal)	B		No						0.0	0	0	$0	$0	$0	0.0
Boiler Room #2	Domestic Hot Water	1	Storage Tank Water Heater (> 50 Gal)	B	NR	Yes	1	Tankless Water Heater	Natural Gas	82.00%	EF	0.0	0	1	$11	$980	$300	60.9

Low-Flow Device Recommendations

Location	Recommendation Inputs					Energy Impact & Financial Analysis						
	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	5	9	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	26	$226	$65	$0	0.3
Restrooms	5	2	Faucet Aerator (Lavatory)	2.00	0.50	0.0	0	5	$44	$14	$0	0.3

Plug Load Inventory

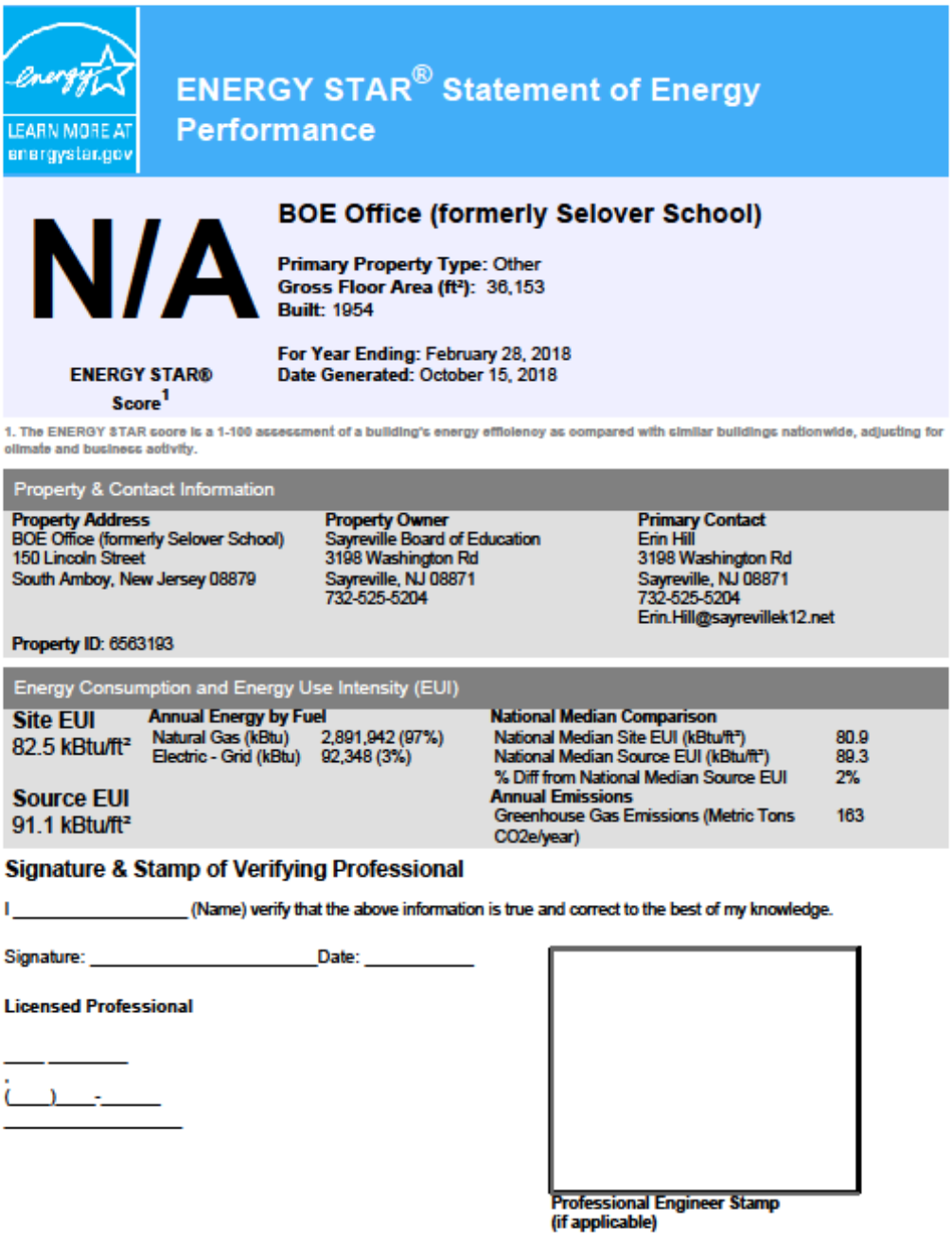
	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Board of Education	36	Desktop Computer	120.0	
Board of Education	24	Laptops	90.0	
Board of Education	10	Fan	100.0	
Board of Education	1	TV	150.0	
Board of Education	3	Smart Board / Projector	300.0	
Board of Education	19	Small Office Printers	50.0	
Board of Education	6	Large Xerox- Type Printers	515.0	
Board of Education	3	Coffee Maker	400.0	
Board of Education	5	Microwave	1,100.0	
Board of Education	1	Residential Refrigerator	690.0	
Board of Education	2	Medium Sized Refrigerator	450.0	
Board of Education	8	Mini Fridge	260.0	
Board of Education	2	Water Dispenser	300.0	
Board of Education	1	Misc. Equipment	1,500.0	
Board of Education	1	Misc. IT Equipment	3,500.0	

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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lounge	1	Refrigerated	6	Yes	0.2	1,612	0	$223	$230	$50	0.8

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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



ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

N/A

ENERGY STAR® Score[1]

BOE Office (formerly Selover School)

Primary Property Type: Other
Gross Floor Area (ft²): 36,153
Built: 1954

For Year Ending: February 28, 2018
Date Generated: October 15, 2018

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
BOE Office (formerly Selover School) 150 Lincoln Street South Amboy, New Jersey 08879	Sayreville Board of Education 3198 Washington Rd Sayreville, NJ 08871 732-525-5204	Erin Hill 3198 Washington Rd Sayreville, NJ 08871 732-525-5204 Erin.Hill@sayrevillek12.net

Property ID: 6563193

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
82.5 kBtu/ft²

Source EUI
91.1 kBtu/ft²

Annual Energy by Fuel		National Median Comparison	
Natural Gas (kBtu)	2,891,942 (97%)	National Median Site EUI (kBtu/ft²)	80.9
Electric - Grid (kBtu)	92,348 (3%)	National Median Source EUI (kBtu/ft²)	89.3
		% Diff from National Median Source EUI	2%
		Annual Emissions	
		Greenhouse Gas Emissions (Metric Tons CO2e/year)	163

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

___ _____
:
(___)___-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate financial savings. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
BTU	A British thermal unit is the amount of heat required to increase the temperature of one pound water by one-degree Fahrenheit. Commonly used to measure natural gas consumption.
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.
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 energy management systems.
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
HVAC	Heating, ventilation, and air conditioning.
kW	Kilowatt. Equal to 1,000 Watts.
Load	The total amount of power used by a building system at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MMBtu	One million British thermal units.
psig	Pounds per square inch.
Plug Load	Refers to the amount of energy used in a space by products that are powered by means of an ordinary AC plug.
Simple Payback	The amount of time needed to recoup the funds expended in an investment, or to reach the break-even point.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
Turnkey	Provision of a complete product or service that is ready for immediate use
Watt (W)	Unit of power commonly used to measure electricity use.