Local Government Energy Audit Report

West New York Public School No. 3 (Annex/Reg. Center)

April 1, 2022

Prepared for:
West New York Board of Education
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Disclaimer

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

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

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

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

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

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ENERGY EFFICIENCY INCENTIVE & REBATE TRANSITION

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

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

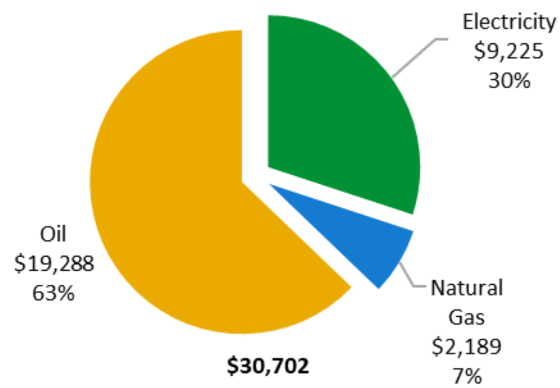
These "next generation" energy efficiency programs feature new ways of managing and delivering programs historically administered by New Jersey's Clean Energy Program™ (NJCEP). All of the investor-owned gas and electric utility companies will now also offer complementary energy efficiency programs and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

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

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for West New York Public School No. 3 (Annex/Reg. Center). This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in your facility. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $30,702 Electricity: 68,640 kWh Natural Gas: 2,679 Therms No. 2 Fuel Oil: 9,776 Gallons	
ENERGY STAR® Benchmarking Score	N/A *(1-100 scale)*	A standard energy use benchmark is not available for this facility type. This report contains suggestions about how to improve building performance and reduce energy costs.

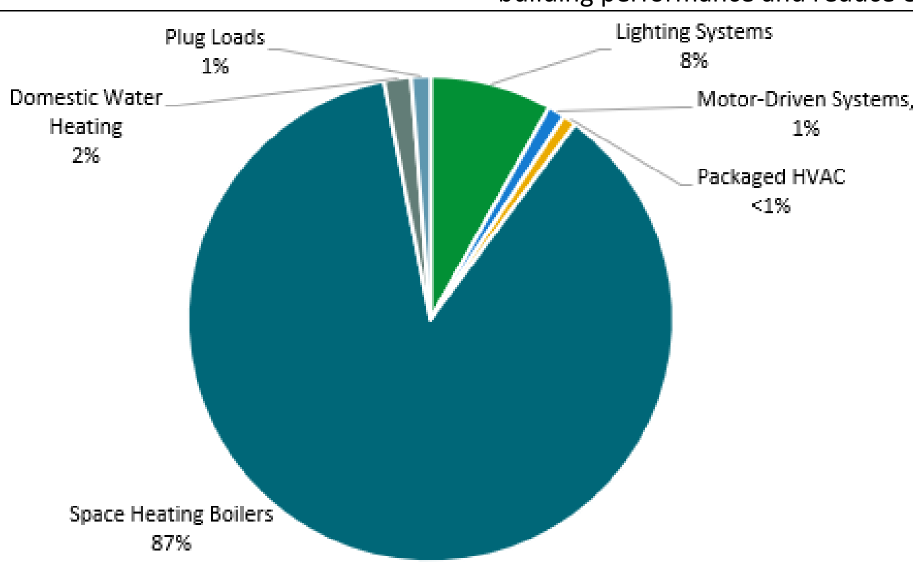


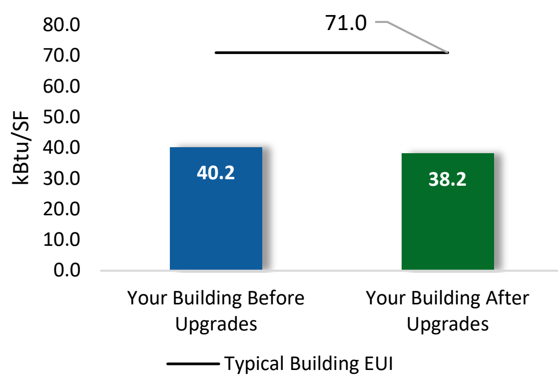
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

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

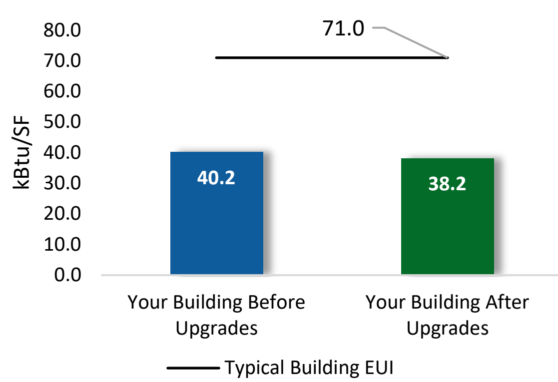
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$32,396
Potential Rebates & Incentives[1]	$6,675
Annual Cost Savings	$3,882
Annual Energy Savings	Electricity: 30,089 kWh Natural Gas: 19 Therms No. 2 Fuel Oil: -90 Gallons
Greenhouse Gas Emission Savings	14 Tons
Simple Payback	6.6 Years
Site Energy Savings (All Utilities)	5%



Scenario 2: Cost Effective Package[2]

Installation Cost	$31,141
Potential Rebates & Incentives	$6,675
Annual Cost Savings	$3,872
Annual Energy Savings	Electricity: 30,015 kWh Natural Gas: 19 Therms No. 2 Fuel Oil: -90 Gallons
Greenhouse Gas Emission Savings	14 Tons
Simple Payback	6.3 Years
Site Energy Savings (all utilities)	5%



On-site Generation Potential

Photovoltaic	None
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**23,288**	**12.3**	**-10**	**$2,993**	**$17,899**	**$3,911**	**$13,988**	**4.7**	**21,878**
ECM 1	Install LED Fixtures	Yes	3,531	1.7	-1	$454	$4,041	$400	$3,641	8.0	3,314
ECM 2	Retrofit Fixtures with LED Lamps	Yes	19,756	10.7	-8	$2,539	$13,858	$3,511	$10,347	4.1	18,564
Lighting Control Measures			**6,728**	**3.6**	**-3**	**$864**	**$13,213**	**$2,750**	**$10,463**	**12.1**	**6,314**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	5,878	3.2	-2	$755	$11,188	$1,490	$9,698	12.8	5,517
ECM 4	Install High/Low Lighting Controls	Yes	850	0.4	0	$109	$2,025	$1,260	$765	7.0	798
Unitary HVAC Measures			**74**	**0.2**	**0**	**$10**	**$1,255**	**$0**	**$1,255**	**126.9**	**74**
ECM 5	Install High Efficiency Air Conditioning Units	No	74	0.2	0	$10	$1,255	$0	$1,255	126.9	74
Domestic Water Heating Upgrade			**0**	**0.0**	**2**	**$16**	**$29**	**$14**	**$14**	**0.9**	**222**
ECM 6	Install Low-Flow DHW Devices	Yes	0	0.0	2	$16	$29	$14	$14	0.9	222
TOTALS (COST EFFECTIVE MEASURES)			**30,015**	**15.9**	**-11**	**$3,872**	**$31,141**	**$6,675**	**$24,466**	**6.3**	**28,415**
TOTALS (ALL MEASURES)			**30,089**	**16.1**	**-11**	**$3,882**	**$32,396**	**$6,675**	**$25,721**	**6.6**	**28,489**

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

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

Figure 2 – Evaluated Energy Improvements

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

1.1 Planning Your Project

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

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

Pick Your Installation Approach

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

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

Options from Around the State

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

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

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

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

Ongoing Electric Savings with Demand Response

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

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for West New York Public School No. 3 (Annex/Reg. Center). This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs.

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

2.1 Site Overview

On August 19, 2021, TRC performed an energy audit at West New York Public School No. 3 (Annex/Reg. Center) located in West New York, New Jersey. TRC met with Rick Solares to review the facility operations and help focus our investigation on specific energy-using systems.

West New York Public School No. 3 (Annex/Reg. Center) is a four-story, 46,190 square foot building built in 1904. The building occupancy was limited to the first floor only. The other spaces were barely being used at the time of the audit. Spaces in the building include classrooms, a gymnasium, offices, a cafeteria, corridors, stairwells, and electrical and mechanical spaces.

2.2 Building Occupancy

The facility is occupied from September through June. The facility is closed on weekends and closes at 4:00 PM on weekdays. During a typical day, the facility is occupied by approximately 20 staff.

Building Name	Weekday/Weekend	Operating Schedule
West New York Public School No. 3 (Annex/Reg. Center)	Weekday	7:00 AM - 4:00 PM
	Weekend	Closed

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

West New York Public School No. 3 (Annex/Reg. Center) is a four-floor building. Building walls are concrete block over structural steel with a brick facade. The roof is pitched with some flat portions. Several parts of the roof are leaky and in poor condition.

The windows are single glazed and have aluminum frames. The glass-to-frame seals are in poor condition. The operable window weather seals are also in poor condition, showing evidence of excessive wear. Exterior doors have aluminum frames and no weather stripping. This increased drafts and outside air infiltration.

We strongly recommend that the facility consider making improvements to the building envelope. While typically not cost effective based on energy savings alone, we have provided some guidance on window upgrades in Section 4.5.

Exterior doors

Windows

Facade

Façade showing the roof

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. Additionally, there are some 26W compact fluorescent lamps (CFL). Typically, T8 fluorescent lamps use electronic ballasts. Gymnasium fixtures have manually controlled high bay 250W high pressure sodium fixtures. All exit signs are 2W LED fixtures.

Fixture types include 1- or 2-lamp, 2- or 4-foot-long troffers or surface mounted fixtures and 2-foot fixtures with U-bend tube lamps. All fixtures are in good condition, and the interior lighting levels are generally sufficient. Interior light fixtures are controlled using wall switches. Exterior fixtures include wall packs with 26W CFLs and are controlled by a time clock.

4-foot T8 fixtures

2-foot T8 fixture

4-foot T8 fixture

Exterior lighting – 26W CFL

2.5 Air Handling Systems

Unit Ventilators

Unit ventilators are equipped with supply fan motors and pneumatically controlled outside air dampers and zone valves connected to the steam distribution system. They provide heating to some areas. This system is original to the building and appears to be in fair operating condition. Other areas are served for heating by steam radiators.

Unitary Electric HVAC Equipment

Various offices and classrooms are cooled using window air conditioning (AC) units. These vary in capacity between 0.6 ton to 2 tons. Most of the units are in good condition. They have an average of EER 11.

Window AC unit – Office 218

Window AC unit – Lounge 217

2.6 Heating Steam Systems

Two 3,040 MBh steam boilers serve the building heating load. These boilers have dual burners that are both fuel oil and natural gas fired. The past two seasons, from the time of the audit, the boilers were natural gas fired. The historical data used in this survey, from 2019, indicates that the boiler was using fuel oil during part of that period and using natural gas during the remainder.

The burners are fully modulating with a nominal efficiency of 78%. The boilers are configured in a lead-lag control scheme. Both boilers are required under high load conditions. Installed in 2016, they are in good condition. There is a service contract in place.

A two-pipe steam distribution system serves the building heating terminals, providing steam to radiators and unit ventilators. There are two 0.3 hp boiler feed pumps in the mechanical room. There are two condensate pumps, and the return pipes have insulation that is in good condition.

Steam boilers

Pipe insulation

Oil pumps

Unit ventilators and radiators

2.7 Domestic Hot Water

There are four domestic hot water heaters in the building; three electric and one natural gas fired. Two of the three electric water heaters have an input capacity of 1.5 kW and a 30-gallon tank capacity, while the third water heater has an input capacity of 2 kW and a 6-gallon tank capacity. The gas fired water heater has an input capacity of 75.1 MBh and a 75-gallon tank capacity with an efficiency rating of 80%.

Fractional hp circulating pumps distribute how water to end uses. The domestic hot water pipes are insulated, and the insulation is in good condition.

Gas-fired water heater

Domestic Hot Water (DHW) - Gymnasium

DHW - Female restroom

DHW – Male restroom

2.8 Plug Load and Vending Machines

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

There are approximately 16 computer workstations throughout the facility. Plug loads throughout the building include general cafe and office equipment. There are classroom typical loads such as smart boards, projectors, and fans.

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

Refrigerator

Copier

2.9 Water-Using Systems

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

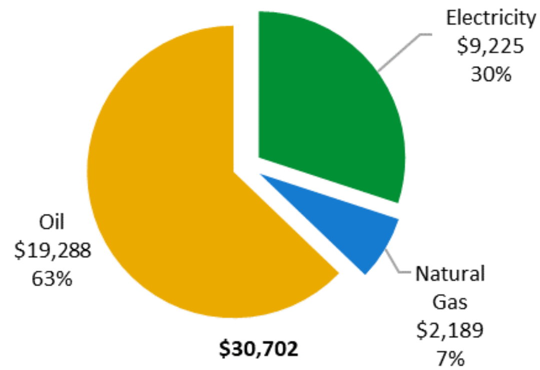
Typical restroom sink

Typical restroom sinks

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	68,640 kWh	$9,225
Natural Gas	2,679 Therms	$2,189
No. 2 Fuel Oil	9,776 Gallons	$19,288
Total		**$30,702**



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

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

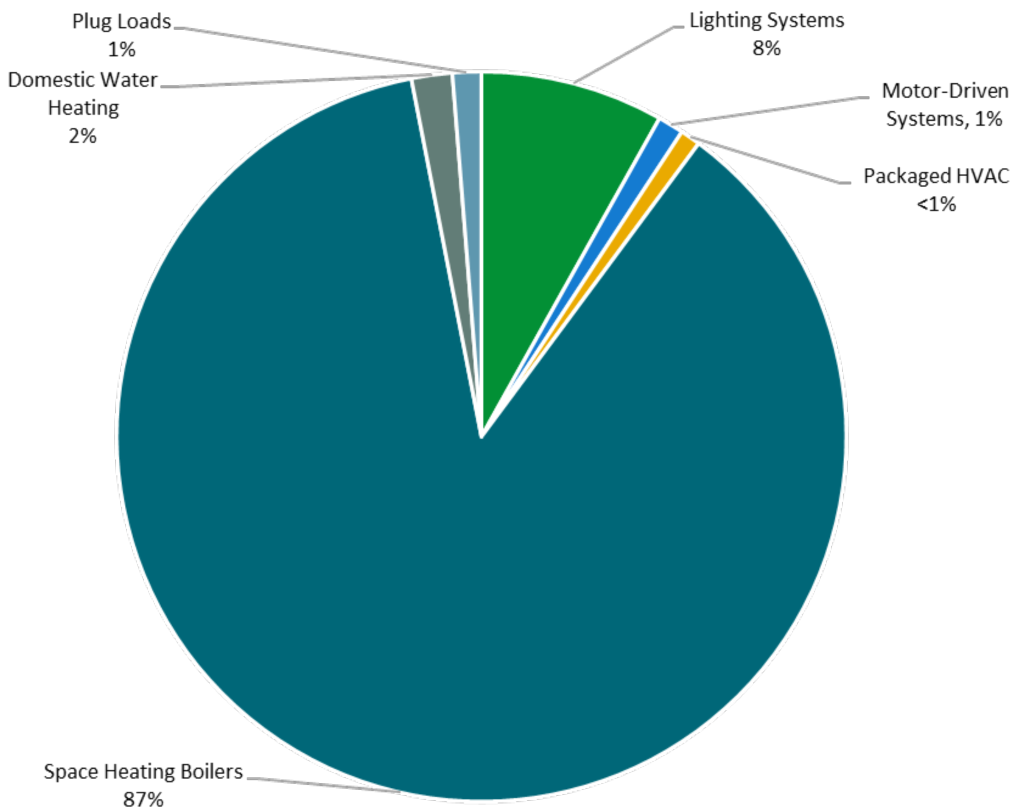
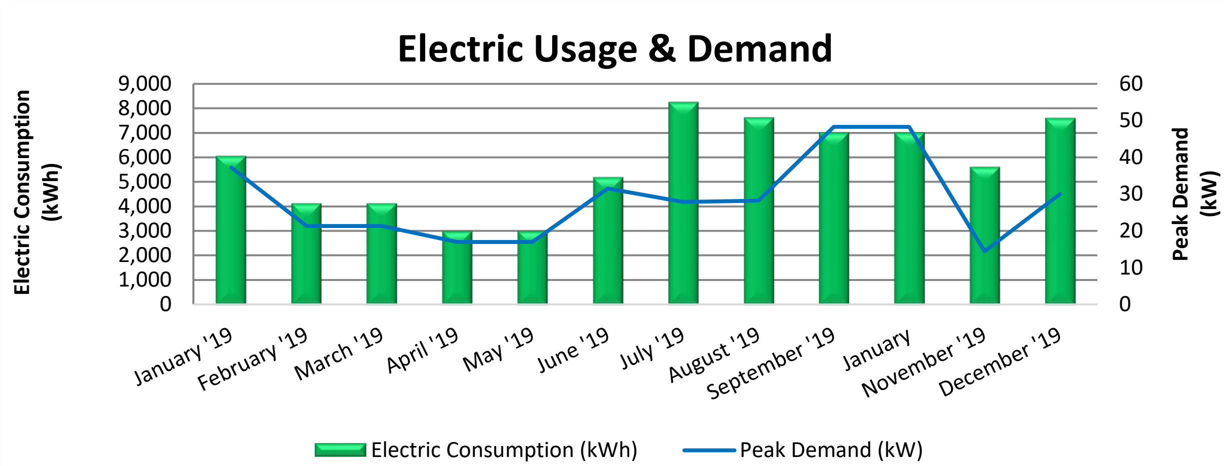


Figure 4 - Energy Balance

3.1 Electricity

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



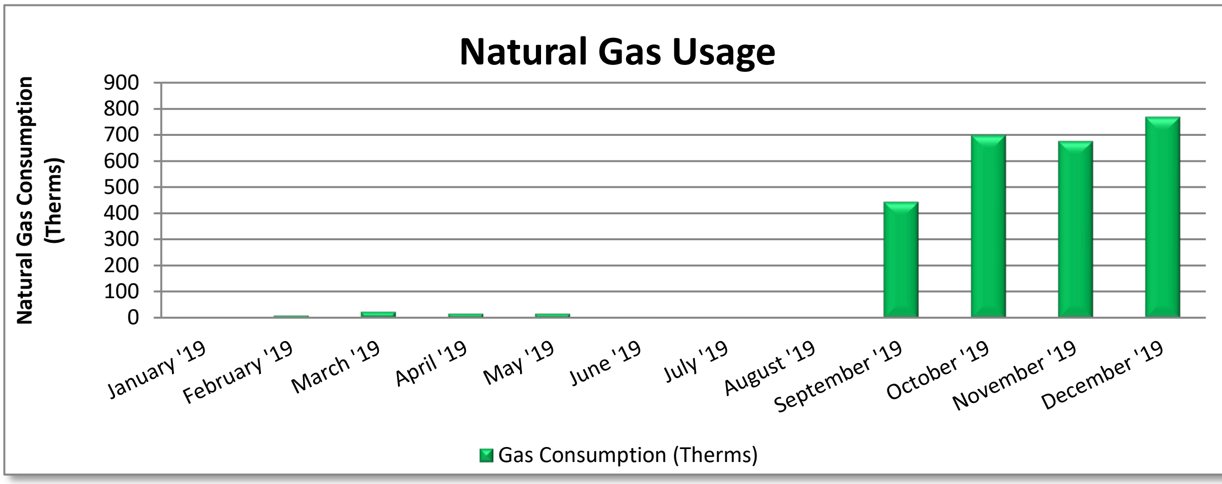
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
1/17/19	30	6,060	37	$146	$754
2/18/19	32	4,140	21	$84	$500
3/19/19	29	4,140	21	$84	$500
4/18/19	30	3,015	17	$95	$413
5/17/19	29	3,015	17	$95	$413
6/18/19	32	5,190	32	$154	$389
7/18/19	30	8,250	28	$384	$1,209
8/16/19	29	7,620	28	$388	$1,152
9/16/19	31	7,005	48	$447	$1,165
10/16/19	30	7,005	48	$447	$1,165
11/14/19	29	5,610	14	$57	$649
12/18/19	34	7,590	30	$118	$917
Totals	**365**	**68,640**	**48**	**$2,499**	**$9,225**
Annual	**365**	**68,640**	**48**	**$2,499**	**$9,225**

Notes:

- Peak demand of 48 kW occurred in September '19.
- Average demand over the past 12 months was 29 kW.
- The average electric cost over the past 12 months was $0.134/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 General Service Gas (GSG), with natural gas supply provided by East Coast Power & Gas, a third-party supplier.



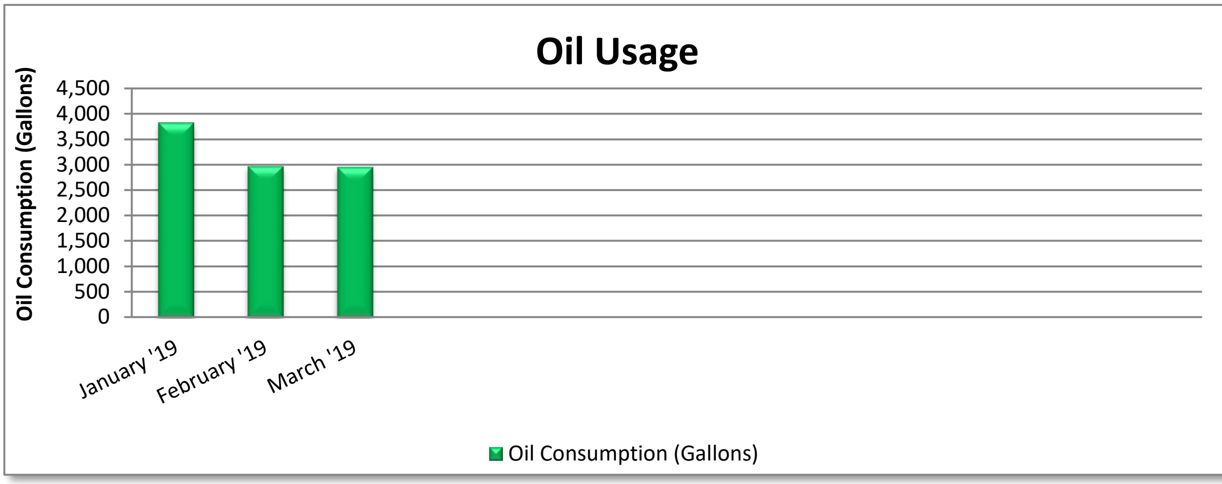
Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
1/17/19	30	4	$19
2/15/19	29	11	$25
3/19/19	32	25	$30
4/18/19	30	18	$29
5/17/19	29	18	$29
6/18/19	32	4	$57
7/18/19	30	4	$19
8/16/19	29	3	$18
8/28/19	12	445	$332
10/16/19	49	700	$523
11/14/19	29	677	$525
12/18/19	34	770	$584
Totals	**365**	**2,679**	**$2,189**
Annual	**365**	**2,679**	**$2,189**

Notes:

- The average gas cost for the past 12 months is $0.817/therm, which is the blended rate used throughout the analysis.
- The relatively low usage at the start of 2019 reflect that the boilers were using fuel oil at the time. Summer use is for domestic water heating.

3.3 No. 2 Fuel Oil

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



No. 2 Fuel Oil Billing Data			
Period Ending	**Days in Period**	**Oil Usage (Gallons)**	**Fuel Cost**
1/29/19	51	3,837	$7,181
2/27/19	29	2,979	$5,987
3/20/19	21	2,960	$6,120
12/9/19	264	0	$0
Totals	**365**	**9,776**	**$19,288**
Annual	**365**	**9,776**	**$19,288**

Notes:

- The average no. 2 fuel oil cost for the past 12 months is $1.973/Gallon, which is the blended rate used throughout the analysis.
- For the first part of 2019, the boiler was using fuel oil.
- Fuel deliveries do not necessarily correspond to periods of use.

3.4 Benchmarking

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

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

Benchmarking Score	**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.

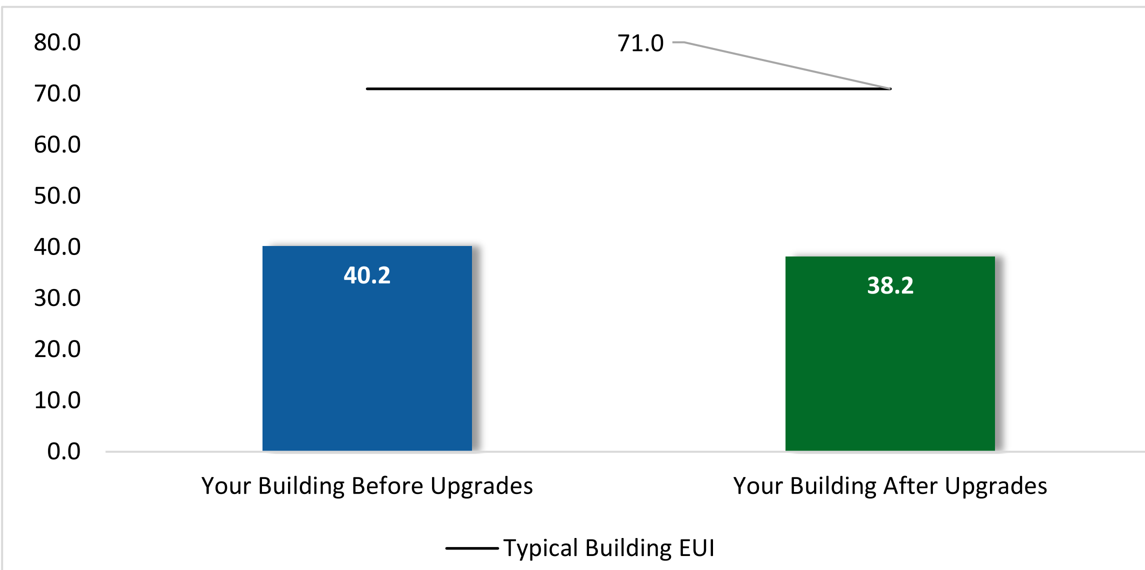


Figure 5 - Energy Use Intensity Comparison[3]

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

[3] Based on all evaluated ECMs

Tracking Your Energy Performance

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

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

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

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

4 Energy Conservation Measures

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

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

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

Financial incentives are based on previously run state rebate programs. New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website. Some measures and proposed upgrades may be eligible for higher incentives than those shown below.

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**23,288**	**12.3**	**-10**	**$2,993**	**$17,899**	**$3,911**	**$13,988**	**4.7**	**21,878**
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ECM 4	Install High/Low Lighting Controls	Yes	850	0.4	0	$109	$2,025	$1,260	$765	7.0	798
Unitary HVAC Measures			**74**	**0.2**	**0**	**$10**	**$1,255**	**$0**	**$1,255**	**126.9**	**74**
ECM 5	Install High Efficiency Air Conditioning Units	No	74	0.2	0	$10	$1,255	$0	$1,255	126.9	74
Domestic Water Heating Upgrade			**0**	**0.0**	**2**	**$16**	**$29**	**$14**	**$14**	**0.9**	**222**
ECM 6	Install Low-Flow DHW Devices	Yes	0	0.0	2	$16	$29	$14	$14	0.9	222
TOTALS			**30,089**	**16.1**	**-11**	**$3,882**	**$32,396**	**$6,675**	**$25,721**	**6.6**	**28,489**

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

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

Figure 6 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**23,288**	**12.3**	**-10**	**$2,993**	**$17,899**	**$3,911**	**$13,988**	**4.7**	**21,878**
ECM 1	Install LED Fixtures	3,531	1.7	-1	$454	$4,041	$400	$3,641	8.0	3,314
ECM 2	Retrofit Fixtures with LED Lamps	19,756	10.7	-8	$2,539	$13,858	$3,511	$10,347	4.1	18,564
Lighting Control Measures		**6,728**	**3.6**	**-3**	**$864**	**$13,213**	**$2,750**	**$10,463**	**12.1**	**6,314**
ECM 3	Install Occupancy Sensor Lighting Controls	5,878	3.2	-2	$755	$11,188	$1,490	$9,698	12.8	5,517
ECM 4	Install High/Low Lighting Controls	850	0.4	0	$109	$2,025	$1,260	$765	7.0	798
Domestic Water Heating Upgrade		**0**	**0.0**	**2**	**$16**	**$29**	**$14**	**$14**	**0.9**	**222**
ECM 6	Install Low-Flow DHW Devices	0	0.0	2	$16	$29	$14	$14	0.9	222
TOTALS		**30,015**	**15.9**	**-11**	**$3,872**	**$31,141**	**$6,675**	**$24,466**	**6.3**	**28,415**

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

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

Figure 7 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**23,288**	**12.3**	**-10**	**$2,993**	**$17,899**	**$3,911**	**$13,988**	**4.7**	**21,878**
ECM 1	Install LED Fixtures	3,531	1.7	-1	$454	$4,041	$400	$3,641	8.0	3,314
ECM 2	Retrofit Fixtures with LED Lamps	19,756	10.7	-8	$2,539	$13,858	$3,511	$10,347	4.1	18,564

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

ECM 1: Install LED Fixtures

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

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

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

Affected building areas: gymnasium fixtures.

ECM 2: Retrofit Fixtures with LED Lamps

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

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

Affected Building Areas: all areas with fluorescent fixtures with T8 tubes and CFL lamps.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**6,728**	**3.6**	**-3**	**$864**	**$13,213**	**$2,750**	**$10,463**	**12.1**	**6,314**
ECM 3	Install Occupancy Sensor Lighting Controls	5,878	3.2	-2	$755	$11,188	$1,490	$9,698	12.8	5,517
ECM 4	Install High/Low Lighting Controls	850	0.4	0	$109	$2,025	$1,260	$765	7.0	798

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

ECM 3: Install Occupancy Sensor Lighting Controls

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

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

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

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

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

ECM 4: Install High/Low Lighting Controls

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

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

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

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

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

Affected Building Areas: hallways and stairwells.

4.3 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**74**	**0.2**	**0**	**$10**	**$1,255**	**$0**	**$1,255**	**126.9**	**74**
ECM 5	Install High Efficiency Air Conditioning Units	74	0.2	0	$10	$1,255	$0	$1,255	126.9	74

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

ECM 5: Install High Efficiency AC Units

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

Affected Units: Storage 219 and Lounge 2nd floor Window ACs. Note that the unit serving the Head Nurse's office was not operating. While it should be replaced, there is no associated savings for the measure.

4.4 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**2**	**$16**	**$29**	**$14**	**$14**	**0.9**	**222**
ECM 6	Install Low-Flow DHW Devices	0	0.0	2	$16	$29	$14	$14	0.9	222

ECM 6: Install Low-Flow DHW Devices

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

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

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

4.5 Measures for Future Consideration

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

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

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

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

Window Replacements

Energy efficient windows are an important consideration when improving the building envelope. The heat transfer through the glass panes are responsible for a significant portion of the facility's heating and cooling energy consumption. We recommend replacing single-pane windows with double-pane windows, and we recommend models that are gas-filled with low-e coatings to reduce heat loss. Windows should be selected with low U-factors to maximize energy savings. The U-factor is the rate at which the window conducts non-solar heat flow and is a key indicator of performance. The lower the U-factor, the higher the efficiency of the window. Window frames and sashes should be efficient as well. If metal frames are specified or required by code, the frame extrusions should have a thermal break to reduce conduction through the frame. As part of the installation, the window frames should be properly sealed with caulk materials to ensure the mitigation of air infiltration. Building envelopes that limit air infiltration and that have adequate fenestrations play a key role in optimizing heating and cooling efficiency, controlling moisture, and providing occupant comfort. Window system replacement is an expensive upgrade that generally involves architectural elements. We recommend this as a measure for further study.

5 Energy Efficient Best Practices

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

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

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

Energy Tracking with ENERGY STAR Portfolio Manager

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

Weatherization

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

Window Treatments/Coverings

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

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

Lighting Maintenance

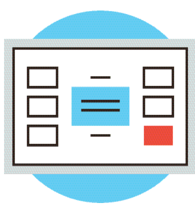
- Clean lamps, reflectors and lenses of dirt, dust, oil, and smoke buildup every six to twelve months. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust. Together, this can reduce total light output by up to 60% while still drawing full power.

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

Motor Maintenance

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

Thermostat Schedules and Temperature Resets



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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the AC or 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. Steam traps are automatic valves that remove condensate from the system. If the traps fail closed, condensate can build up in the steam supply side of the trap, which reduces the flow in the steam lines and thermal capacity of the radiators. Or they may fail open, allowing steam into the condensate return lines resulting in wasted energy, water, and hammering. Losses can be significantly reduced by testing and replacing equipment as they start to fail. Repair or replace traps that are blocked or allowing steam to pass. Inspect steam traps as part of a regular steam system maintenance plan.

Thermostatic Radiator Valve Installations

We recommend investigating the installation of thermostatic control valves for existing radiators. Traditionally radiators have manual valves that are used to control the flow through the radiator. Replacing these manual valves with thermostatic control valves allows for automatic modulation of the steam or hot water flow to maintain the temperature setting. The valve will incrementally close as space temperature increases. This will allow a maximum temperature to be set per area/room. Using thermostatic control valves will result in energy savings by reducing the overheating of spaces throughout the facility.

Boiler Maintenance

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

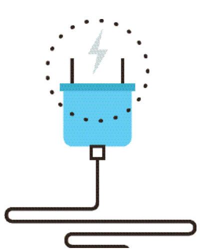
Water Heater Maintenance

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

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

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

Plug Load Controls



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

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense® ratings for urinals is 0.5 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.

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

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

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

6 On-site Generation

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

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

6.1 Solar Photovoltaic

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

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has no potential for installing a PV array.

This facility does not appear to meet the minimum criteria for a cost-effective solar PV installation. To be cost-effective, a solar PV array needs certain minimum criteria, such as sufficient and sustained electric demand and sufficient flat or south-facing rooftop or other unshaded space on which to place the PV panels.

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.

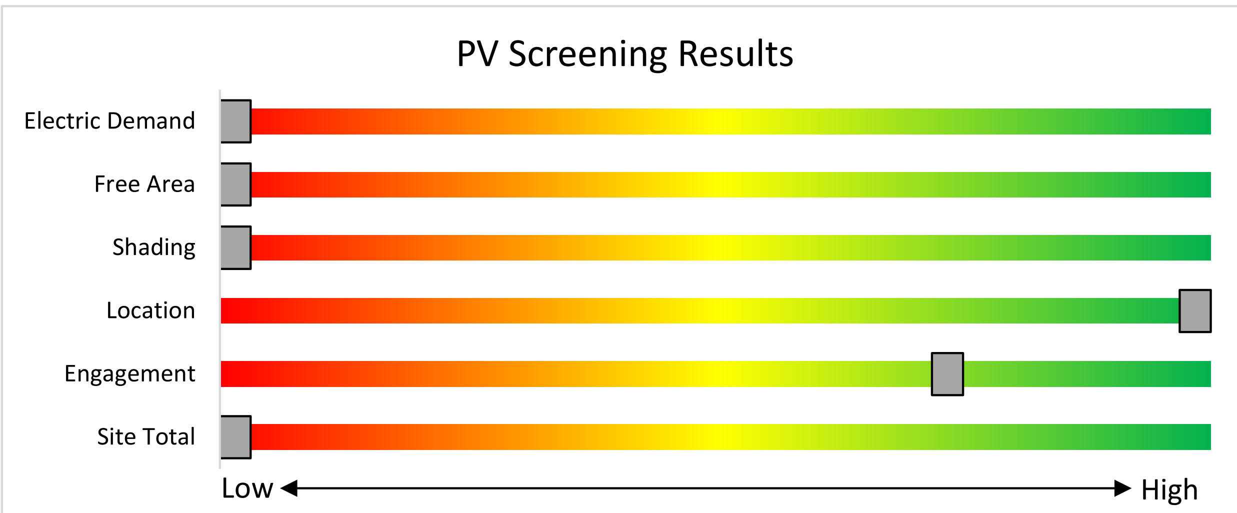


Figure 8 - Photovoltaic Screening

Successor Solar Incentive Program (SuSI)

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

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

Successor Solar Incentive Program (SuSI): https://www.njcleanenergy.com/renewable-energy/programs/susi-program

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

6.2 Combined Heat and Power

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

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

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

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

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

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

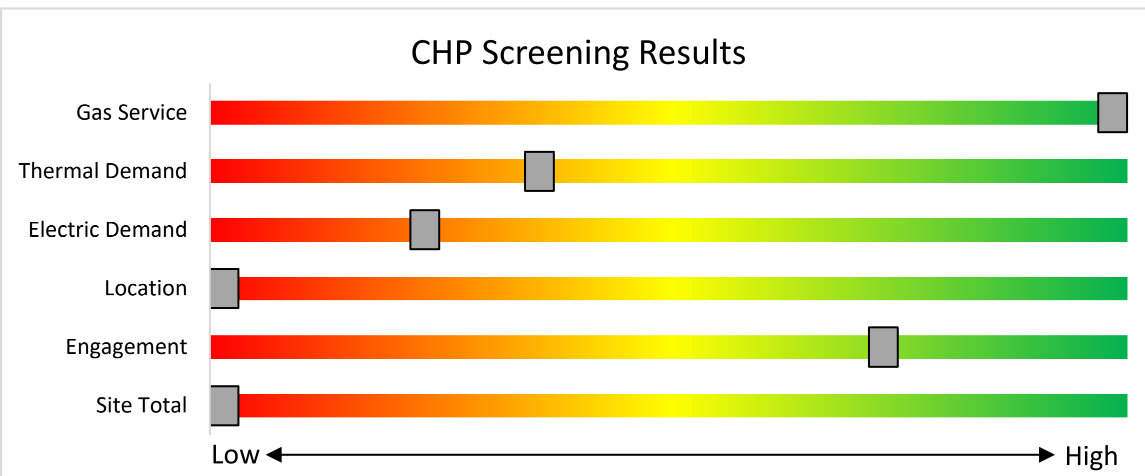


Figure 9 - Combined Heat and Power Screening

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

7 Project Funding and Incentives

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

7.1 Utility Energy Efficiency Programs

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

8 New Jersey's Clean Energy Programs

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

8.1 Combined Heat and Power

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

Incentives

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

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

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

How to Participate

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

8.2 Energy Savings Improvement Program

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

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

How to Participate

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

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

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

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

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

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

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

8.3 Successor Solar Incentive Program (SuSI)

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

Administratively Determined Incentive (ADI) Program

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

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

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

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

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

The ADI Program online portal is now open to new registrations effective August 28, 2021.

Competitive Solar Incentive Program

The Competitive Solar Incentive (CSI) Program will provide competitively set incentives for grid supply projects and net metered non-residential projects greater than 5MW. The program is currently under development with the goal of holding the first solicitation by early-to-mid 2022. For updates, please continue to check the Solar Proceedings page on the New Jersey's Clean Energy Program website.

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

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

9 Project Development

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

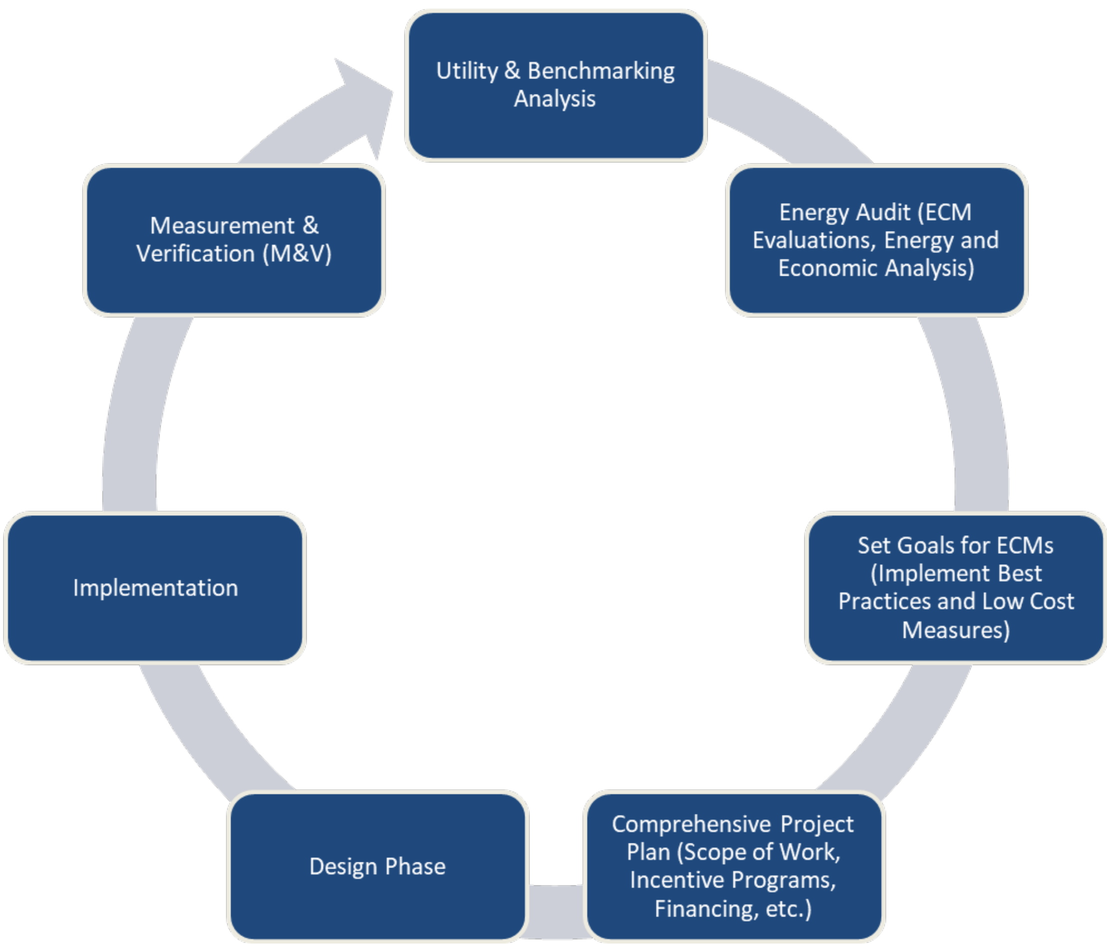


Figure 10 – Project Development Cycle

10 Energy Purchasing and Procurement Strategies

10.1 Retail Electric Supply Options

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

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

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

10.2 Retail Natural Gas Supply Options

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

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

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

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

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

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

TRC

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 101	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Classroom 102	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Classroom 106	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Classroom 107	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.5	1,011	0	$130	$708	$155	4.3
Classroom 108	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Classroom 110	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Corridor 1st	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 1st	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	1,920	2, 4	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,325	0.2	372	0	$48	$596	$320	5.8
Corridor 1st	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None		62	1,920	2, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,325	0.2	355	0	$46	$371	$180	4.2
Corridor 1st	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	None		114	1,920	2, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,325	0.1	312	0	$40	$371	$110	6.5
Corridor 220	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,920	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,920	0.0	70	0	$9	$37	$10	3.0
Corridor 220	1	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch		110	1,920		None	No	1	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch	110	1,920	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	1,920	2, 4	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,325	0.2	465	0	$60	$633	$400	3.9
Head Nurses Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.1	168	0	$22	$189	$40	6.9
Janitorial Closet 1	1	Compact Fluorescent: (2) 26W Double Biaxial Plug-In Lamps	Wall Switch		52	1,152	2	Relamp	No	1	LED Lamps: GX23 (Plug-In) Lamps	Wall Switch	37	1,152	0.0	19	0	$2	$25	$2	9.4
Lounge 104	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Main Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.1	168	0	$22	$189	$40	6.9
Main Office	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,259	0.2	472	0	$61	$705	$95	10.1
Office - 105	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Office - 1st Floor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.1	168	0	$22	$189	$40	6.9
Office - 212	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Office - 213	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Office - 214	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Office - 216	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office - 218	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.2	337	0	$43	$416	$75	7.9
Office - 220	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Restroom - 107	1	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch		63	1,824	2	Relamp	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	1,824	0.0	58	0	$7	$65	$12	7.1
Restroom - 110	1	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch		63	1,824	2	Relamp	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	1,824	0.0	58	0	$7	$65	$12	7.1
Restroom - 220	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,824	0.0	66	0	$9	$37	$10	3.1
Stairs A	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs A	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch		33	1,920	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,920	0.0	34	0	$4	$33	$6	6.1
Stairs A	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	None		32	1,920	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,325	0.1	186	0	$24	$343	$55	12.1
Stairs A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,920	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,920	0.0	70	0	$9	$37	$10	3.0
Stairs B	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs B	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	None		32	1,920	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	None	15	1,920	0.0	37	0	$5	$18	$5	2.8
Stairs B	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,920	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,325	0.2	443	0	$57	$453	$85	6.5
Stairs B	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	1,920	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,920	0.0	61	0	$8	$72	$10	7.9
Stairs C	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs C	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	1,920	2, 3	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,325	0.1	186	0	$24	$343	$55	12.1
Storage 103	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.3	426	0	$55	$562	$115	8.2
Storage 109	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.3	426	0	$55	$562	$115	8.2
Storage 110	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,152	0.0	42	0	$5	$37	$10	4.9
Storage 211	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.3	426	0	$55	$562	$115	8.2
Storage 219	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.3	426	0	$55	$562	$115	8.2
Storage 220	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.3	426	0	$55	$562	$115	8.2
Storage Archives	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	1,152	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	795	0.5	639	0	$82	$708	$155	6.7
Storage B1	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.5	639	0	$82	$708	$155	6.7
Storage B5	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	1,152	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,152	0.0	22	0	$3	$18	$5	4.7
Storage B5	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.4	532	0	$68	$635	$135	7.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Storage BK	14	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	1,152	2, 3	Relamp	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	795	1.0	1,312	-1	$169	$1,292	$315	5.8
Conference 217a	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.1	168	0	$22	$189	$40	6.9
Janitorial 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	1,152	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,152	0.0	22	0	$3	$18	$5	4.7
Lounge 217	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.3	674	0	$87	$562	$115	5.2
Lounge 2nd Floor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.1	168	0	$22	$189	$40	6.9
Storage 215	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.3	426	0	$55	$562	$115	8.2
Gymnasium	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gymnasium	8	High-Pressure Sodium: (1) 250W Lamp	Wall Switch		295	1,824	1, 3	Fixture Replacement	Yes	8	LED - Fixtures: High-Bay	Occupancy Sensor	75	1,259	1.8	3,904	-2	$501	$4,311	$435	7.7
Gymnasium	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch		33	1,824	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,824	0.0	32	0	$4	$33	$6	6.4
Basement Exit Stairs	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,920	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,325	0.1	177	0	$23	$189	$40	6.5
Boiler Room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Boiler Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch		22	1,824	2	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	1,824	0.0	27	0	$3	$16	$3	3.8
Boiler Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.1	168	0	$22	$189	$40	6.9
Boiler Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	1,824	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,259	0.3	594	0	$76	$562	$115	5.9
Boiler Room	1	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch		110	1,824		None	No	1	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch	110	1,824	0.0	0	0	$0	$0	$0	0.0
Cafeteria	2	Exit Signs: LED - 2 W Lamp	None		6	8,322		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,322	0.0	0	0	$0	$0	$0	0.0
Cafeteria	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	1,824	2	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,824	0.0	35	0	$5	$18	$5	2.9
Cafeteria	10	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch		110	1,824	3	None	Yes	10	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Occupancy Sensor	110	1,259	0.3	684	0	$88	$270	$35	2.7
Corridor Basement	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor Basement	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch		32	1,920	2, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	1,325	0.0	93	0	$12	$262	$80	15.2
Corridor Basement	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,920	2, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,325	0.2	355	0	$46	$371	$180	4.2
Corridor Basement	6	Linear Fluorescent - T8: 8' T8 (59W) - 2L	Wall Switch		110	1,920	4	None	Yes	6	Linear Fluorescent - T8: 8' T8 (59W) - 2L	High/Low Control	110	1,325	0.2	432	0	$56	$225	$210	0.3
Corridor Basement	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	1,920	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	1,920	0.0	61	0	$8	$72	$10	7.9
Electrical Room - Telecommunications	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,152	0.0	42	0	$5	$37	$10	4.9
Electrical Room 1	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.2	266	0	$34	$453	$85	10.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Electrical Room 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,152	0.0	42	0	$5	$37	$10	4.9
Kitchen	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.2	337	0	$43	$416	$75	7.9
Office - Nurse (Old)	2	Linear Fluorescent - T8: 8' T8 (59W) - 1L	Wall Switch		58	1,824		None	No	2	Linear Fluorescent - T8: 8' T8 (59W) - 1L	Wall Switch	58	1,824	0.0	0	0	$0	$0	$0	0.0
Restroom - Female Basement	8	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,259	0.3	630	0	$81	$850	$115	9.1
Restroom - Male Basement	8	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,259	0.3	630	0	$81	$850	$115	9.1
Restroom - Nurse (Old)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,824	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,259	0.1	168	0	$22	$189	$40	6.9
Storage B2	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2, 3	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	795	0.8	1,011	0	$130	$1,234	$260	7.5
Storage B2 #2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	1,152	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,152	0.0	42	0	$5	$37	$10	4.9
Exterior	10	Compact Fluorescent: (1) 26W Double Biaxial Plug-In Lamp	Photocell		26	4,380	2	Relamp	No	10	LED Lamps: GX23 (Plug-In) Lamps	Photocell	19	4,380	0.0	307	0	$41	$125	$10	2.8

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Boiler Room	2	Boiler Feed Water Pump	0.3	70.0%	No			W	600		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	Combustion Air Fan	1.0	85.5%	No			W	600		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	Combustion Air Fan	2.0	86.5%	No			W	600		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	2	Condensate Pump	1.0	84.5%	No			W	600		No	84.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	Condensate Pump	1.0	84.5%	No			W	600		No	84.5%	No		0.0	0	0	$0	$0	$0	0.0
Kitchen	Kitchen	1	Exhaust Fan	0.3	60.0%	No			W	1,920		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Restroom - Female Basement	Restroom - Female Basement	1	Exhaust Fan	0.3	60.0%	No			W	1,920		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Restroom - Male Basement	Restroom - Male Basement	1	Exhaust Fan	0.3	60.0%	No			W	1,920		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage B2	Storage B2	1	Fan Coil Unit	0.3	60.0%	No			W	600		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	DHW Circulation Pump	0.2	60.0%	No			W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	Process Pump	0.3	60.0%	No			W	600		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	Process Pump	0.3	60.0%	No			W	600		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	Process Pump	0.3	60.0%	No			W	600		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	Process Pump	0.3	60.0%	No			W	600		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0

Packaged HVAC Inventory & Recommendations

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 102	Classroom 102	1	Window AC	1.25		10.80		LG	LW1512ERS	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 106	Classroom 106	1	Window AC	2.00		11.20		Frigidaire	FFRE25	W		No							0.0	0	0	$0	$0	$0	0.0
Classroom 108	Classroom 108	1	Window AC	1.25		10.80		LG	LW1512ERS	W		No							0.0	0	0	$0	$0	$0	0.0
Head Nurses Office	Head Nurses Office	1	Window AC	1.00		10.00		Frigidaire		B		No							0.0	0	0	$0	$0	$0	0.0
Lounge 104	Lounge 104	1	Window AC	1.00		10.00		LG	Unknown	W		No							0.0	0	0	$0	$0	$0	0.0
Main Office	Main Office	1	Window AC	1.00		10.00		LG	Unknown	W		No							0.0	0	0	$0	$0	$0	0.0
Office - 105	Office - 105	1	Window AC	2.00		11.20		Frigidaire	FFRE25	W		No							0.0	0	0	$0	$0	$0	0.0
Office - 212	Office - 212	1	Window AC	1.17		11.80		GE	AEM14AVL1	W		No							0.0	0	0	$0	$0	$0	0.0
Office - 213	Office - 213	1	Window AC	1.17		11.80		GE	AEM14AVL1	W		No							0.0	0	0	$0	$0	$0	0.0
Office - 214	Office - 214	1	Window AC	1.17		11.80		GE	AEM14AVL1	W		No							0.0	0	0	$0	$0	$0	0.0
Office - 216	Office - 216	1	Window AC	1.17		11.80		GE	AEM14AVL1	W		No							0.0	0	0	$0	$0	$0	0.0
Office - 218	Office - 218	1	Window AC	1.17		11.80		GE	AEM14AVL1	W		No							0.0	0	0	$0	$0	$0	0.0
Office - 220	Office - 220	1	Window AC	1.17		11.80		GE	AEM14AVL1	W		No							0.0	0	0	$0	$0	$0	0.0
Storage 219	Storage 219	1	Window AC	0.75		9.80		Unknown	Unknown	B	5	Yes	1	Window AC	0.75		12.00		0.1	35	0	$5	$612	$0	130.8
Storage 220	Storage 220	1	Window AC	0.75		10.30		Frigidaire	Unknown	W		No							0.0	0	0	$0	$0	$0	0.0
Conference 217a	Conference 217a	1	Window AC	1.17		11.80		GE	AEM14AVL1	W		No							0.0	0	0	$0	$0	$0	0.0
Lounge 217	Lounge 217	1	Window AC	2.00		11.20		Frigidaire	FFRE25	W		No							0.0	0	0	$0	$0	$0	0.0
Lounge 2nd Floor	Lounge 2nd Floor	1	Window AC	0.83		9.80		GE	AGN10ACG1	B	5	Yes	1	Window AC	0.83		12.00		0.1	39	0	$5	$643	$0	123.5
Storage 215	Storage 215	1	Window AC	0.67		9.80		Frigidaire	FFRH0822R15	W		No							0.0	0	0	$0	$0	$0	0.0

Space Heating Boiler Inventory & Recommendations

		Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Boiler room	Various	1	Forced Draft Steam Boiler	3,040	HB Smith	28HE-12	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler room	Various	1	Forced Draft Steam Boiler	3,040	HB Smith	28HE-12	W		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	**Area(s)/System(s) Served**	System Quantity	System Type	Manufacturer	Model	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Gymnasium	Gymnasium	1	Storage Tank Water Heater (≤ 50 Gal)	Rheem	PRO E6 1 RH POU	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler Room	1	Storage Tank Water Heater (> 50 Gal)	Rheem	42V75F	W		No						0.0	0	0	$0	$0	$0	0.0
Restroom - Female Basement	Restroom - Female Basement	1	Storage Tank Water Heater (≤ 50 Gal)	Hubbel	HE30-1 5SLA	W		No						0.0	0	0	$0	$0	$0	0.0
Restroom - Male Basement	Restroom - Male Basement	1	Storage Tank Water Heater (≤ 50 Gal)	Hubbel	HE30-1 5SLA	W		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restroom	6	4	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	2	$16	$29	$14	0.9

Plug Load Inventory

	Existing Conditions					
Location	**Quantity**	**Equipment Description**	**Energy Rate (W)**	**ENERGY STAR Qualified?**	**Manufacturer**	**Model**
Annex Registration Center	6	Coffee Machine	400	No		
Annex Registration Center	16	Desktop	145	No		
Annex Registration Center	1	Fan (Poratable)	60	No		
Annex Registration Center	4	Microwave	900	No		
Annex Registration Center	3	Paper Shredder	200	No		
Annex Registration Center	10	Printer (Medium/Small)	60	No		
Annex Registration Center	4	Printer (Copier)	200	No		
Annex Registration Center	3	Refrigerator (mini)	80	No		
Annex Registration Center	2	Refrigerator (Residential)	200	No		
Annex Registration Center	3	Smart Board	5	No		
Annex Registration Center	1	Television	100	No		
Annex Registration Center	2	Toaster Oven	1,200	No		
Annex Registration Center	1	Water Cooler	500	No		

APPENDIX B: ENERGY STAR STATEMENT OF ENERGY PERFORMANCE

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

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ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

West New York Public School No. 3 (Annex/Registration Center)

Primary Property Type: Mixed Use Property
Gross Floor Area (ft²): 46,190
Built: 1904

For Year Ending: December 31, 2019
Date Generated: December 17, 2021

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
West New York Public School No. 3 (Annex/Registration Center) 5401 Polk Street West New York, New Jersey 07093	West New York Board of Education 6028 Broadway West New York, NJ 07093 (201) 553-4000	Dean Austin 6028 Broadway West New York, NJ 07093 (201) 553-4000 x 30063 daustin@wnyschools.net

Property ID: 15345004

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
37.6 kBtu/ft²

Source EUI
47.3 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	298,952 (17%)
Fuel Oil (No. 2) (kBtu)	1,204,180 (69%)
Electric - Grid (kBtu)	234,274 (14%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	71
National Median Source EUI (kBtu/ft²)	89.3
% Diff from National Median Source EUI	-47%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	127

Signature & Stamp of Verifying Professional

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

LP Signature: ______________________ Date: ___________

Licensed Professional

____ ________
,
(____)____-______
____

Professional Engineer or Registered Architect Stamp

APPENDIX C: GLOSSARY

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

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

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