Local Government Energy Audit Report

Vineland Police Station

August 26, 2022

Prepared for:
City of Vineland
620 East Plum Street
Vineland, New Jersey 08360

Prepared by:
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New Brunswick, New Jersey 08901

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.

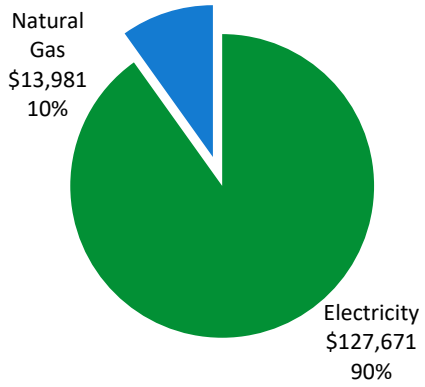
These next generation energy efficiency programs feature new ways of managing and delivering programs historically administered by New Jersey's Clean Energy Program™ (NJCEP). All of the investor-owned gas and electric utility companies will now also offer complementary energy efficiency programs and 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 under development. 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 Vineland Police Building/Station. 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: $141,652 Electricity: 860,080 kWh Natural Gas: 10,592 Therms	
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.

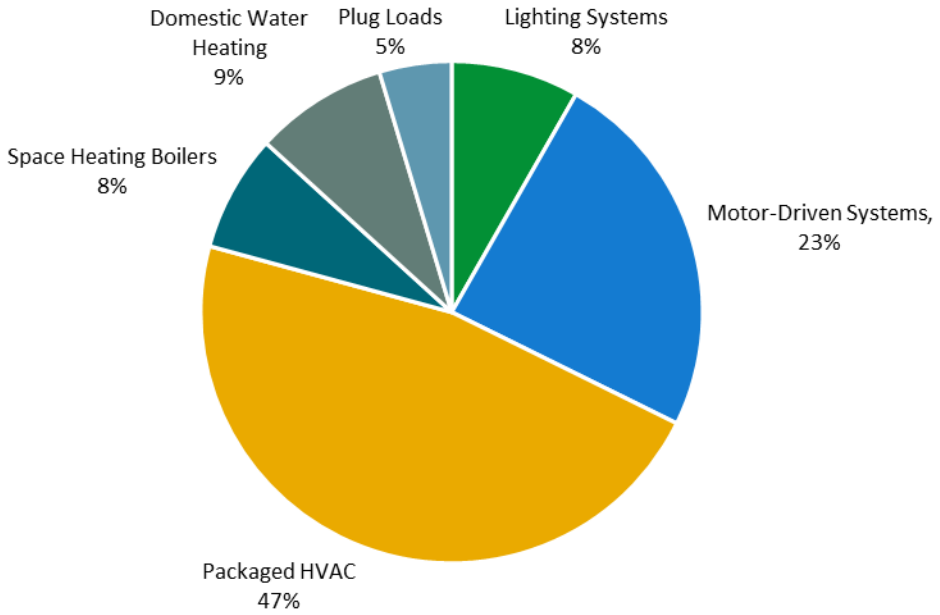


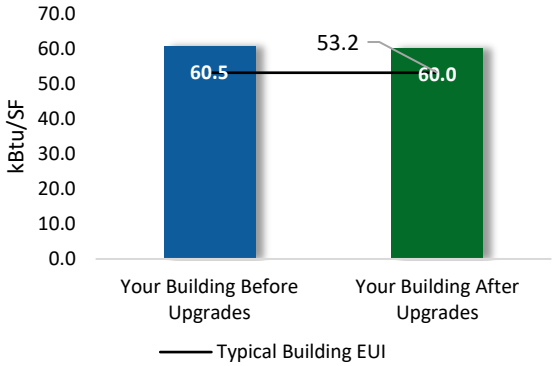
Figure 1 - Energy Use by System

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.

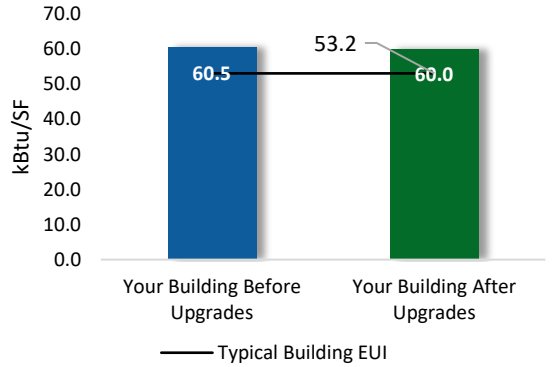
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$1,154
Potential Rebates & Incentives[1]	$205
Annual Cost Savings	$623
Annual Energy Savings	Electricity: 1,954 kWh Natural Gas: 253 Therms
Greenhouse Gas Emission Savings	2 Tons
Simple Payback	1.5 Years
Site Energy Savings (All Utilities)	1%



Scenario 2: Cost Effective Package[2]

Installation Cost	$1,154
Potential Rebates & Incentives	$205
Annual Cost Savings	$623
Annual Energy Savings	Electricity: 1,954 kWh Natural Gas: 253 Therms
Greenhouse Gas Emission Savings	2 Tons
Simple Payback	1.5 Years
Site Energy Savings (all utilities)	1%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade			**0**	**0.0**	**25**	**$333**	**$694**	**$155**	**$539**	**1.6**	**2,957**
ECM 1	Install Low-Flow DHW Devices	Yes	0	0.0	25	$333	$694	$155	$539	1.6	2,957
Food Service & Refrigeration Measures			**1,954**	**0.2**	**0**	**$290**	**$460**	**$0**	**$460**	**1.6**	**1,968**
ECM 2	Vending Machine Control	Yes	1,954	0.2	0	$290	$460	$0	$460	1.6	1,968
TOTALS (COST EFFECTIVE MEASURES)			**1,954**	**0.2**	**25**	**$623**	**$1,154**	**$155**	**$999**	**1.6**	**4,925**
TOTALS (ALL MEASURES)			**1,954**	**0.2**	**25**	**$623**	**$1,154**	**$155**	**$999**	**1.6**	**4,925**

* - 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, such as 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.

Successor Solar Incentive Program (SuSI)

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

Ongoing Electric Savings with Demand Response

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

Large Energy User Program (LEUP)

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

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Vineland Police Building/Station. 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 March 8, 2022, TRC performed an energy audit at Vineland Police Building/Station located in Vineland, New Jersey. TRC met with Herman Torres to review the facility operations and help focus our investigation on specific energy-using systems.

Vineland Police Station is a two-story, 66,000 square foot building with basement, and was built in 2020. Spaces include a gymnasium, offices, cafeteria, corridors, stairwells, kitchen, and mechanical space.

2.2 Building Occupancy

The facility is occupied year-round.

Building Name	Weekday/Weekend	Operating Schedule
Vineland Police Building/Station	Weekday	24/7
	Weekend	24/7

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

The walls consist of a brick and stucco façade over a painted CMU interior finish. The flat roof is supported with steel trusses and a reinforced concrete deck and finished with an insulated layer and covered with a white membrane. Most of the windows are double paned with aluminum frames. The glass-to-frame seals are in good condition. The operable window weather seals are in good condition, showing little evidence of excessive wear. Exterior doors have aluminum frames and are in good condition with undamaged door seals. Degraded window and door seals increase drafts and outside air infiltration.

Building Windows

Building Roof

Exterior Doors

Side of Building

2.4 Lighting Systems

The primary interior lighting system uses 18-Watt linear LED T8 lamps. There are also a significant number of ambient 2-foot x 2-foot LED fixtures and a few general purpose LED lamps. Fixture types include 1-lamp, 2-lamp or 4-lamp, 4-foot or 8-foot-long troffer, recessed, and surface mounted fixtures. Most fixtures are in good condition. Gymnasium fixtures have sensor controlled linear LED lamps. All exit signs are LED units. Interior lighting levels were generally sufficient. Most lighting fixtures are controlled by occupancy sensors and the remainder by wall switches.

Linear LED Fixture

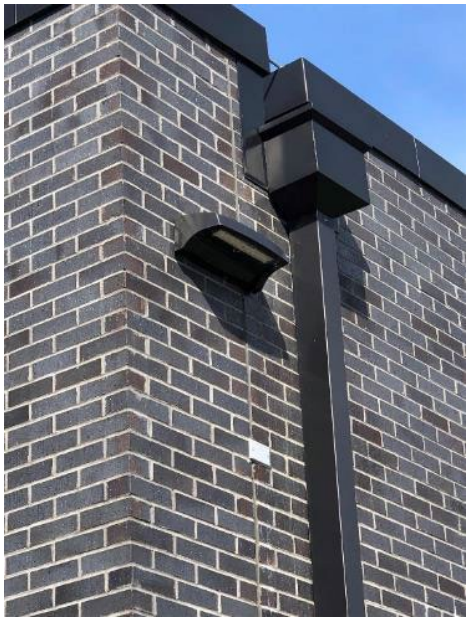
Ambient 2x2 LED Fixture

LED A-Lamp Bulb

LED Exit Sign

Building exterior fixtures include wall packs, flood lights, and canopy lights with LED lamps. There are a significant number of pole mounted flood fixtures, all using LED sources. Exterior light fixtures are controlled by a time clock and switch, depending on the fixture.

LED Pole Flood Light



LED Wallpack

2.5 Air Handling Systems

Unitary Electric HVAC Equipment

Various office areas throughout the facility are conditioned by unitary electric HVAC equipment, mainly split air conditioning (AC) systems. These are all operating within their useful life, in good condition, and are relatively high efficiency. Their cooling capacity ranges between 5 tons and 16 tons with an energy efficiency rating (EER) of 17. There are also two variable refrigerant flow (VRF) split air-source heat pumps (HP), a 1-ton and 10-ton unit with varying heating capacity ratings.

Outdoor Condensing Unit

Unitary Heating Equipment

The garage is heated by suspended unit heater supplied by the hot water from the boilers. This unit is in good condition. Equipment is controlled by a manual dial thermostat.

Unit Heater

Packaged Units

The police department is served by multiple gas-fired packaged roof top units with direct expansion (DX) cooling, including:

Unit	Cooling Capacity (tons)	Heating Capacity (MBh)
RTU-1	11.00	156.00
RTU-2	7.00	72.90
RTU-3	13.00	156.00
RTU-4	16.00	218.70
RTU-5	4.00	49.00
RTU-6	15.00	156.00
RTU-7	4.00	49.00
RTU-8	10.00	168.00
RTU-9	10.00	72.90

Refer to Appendix A for detailed information about each unit.

Packaged Rooftop Unit

Air Handling Units (AHUs)

An area of the building is conditioned by an air handling unit equipped with a supply fan motor, hot water heating coil, and refrigerant coil for cooling. This unit is associated with the larger split air conditioning (AC) system described above. The heating coil is supplied by the hot water boiler, which is described in the section that follows. The supply fan motor is assumed to be 1.5 hp, equipped with a variable speed drive.

2.6 Heating Hot Water Systems

Two Aerco Int. 472 MBh condensing hot water boilers serve a portion of the building's heating load at a nominal efficiency of 94%. The boilers are configured in a lead-lag control scheme. Installed in 2020, they are in good condition. The hydronic distribution system is a heating-only system. The boilers serve a primary/secondary distribution system with two, 1.5 hp variable speed (VFD) controlled pumps circulating the primary loop and two, 5.0 hp VFD controlled heating hot water pumps operating in lead/lag fashion on the secondary loop. The boilers provide hot water to convectors throughout the building and to the suspended unit heater. Supply and return pipe insulation are in good condition.

Hydronic Boilers

2.7 Domestic Hot Water

Hot water is produced by two, 100-gallon, 200 MBh gas-fired, condensing storage water heaters with an efficiency rating of up to 97%. Two, 0.2 hp circulation pumps distribute water to end uses and operate continuously. The domestic hot water pipes are insulated, and the insulation is in good condition.

Storage Hot Water Tanks

2.8 Plug Load and Vending Machines

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

There are 136 computer workstations throughout the facility. Plug loads include general cafe and office equipment. There are several residential-style refrigerators, monitors, and coffee machines throughout the building. They vary in condition and efficiency.

There is one refrigerated beverage vending machine and one non-refrigerated vending machine. They do not appear to be equipped with occupancy-based controls.

Coffee Machine

Water Cooler

Refrigerated Vending Machine

Large Copier Machine

2.9 Water-Using Systems

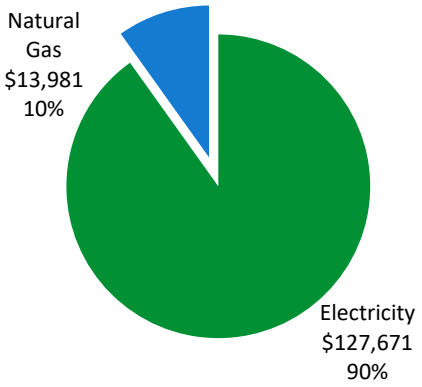
There are six restrooms with toilets, urinals, and sinks. Faucet flow rates are at 2.2 gallons per minute (gpm) or higher. The locker rooms have two restrooms with showers and showerheads are rated at 2.5 gpm. Both locker rooms are frequently used.

Restroom Faucet

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	860,080 kWh	$127,671
Natural Gas	10,592 Therms	$13,981
Total		**$141,652**



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.

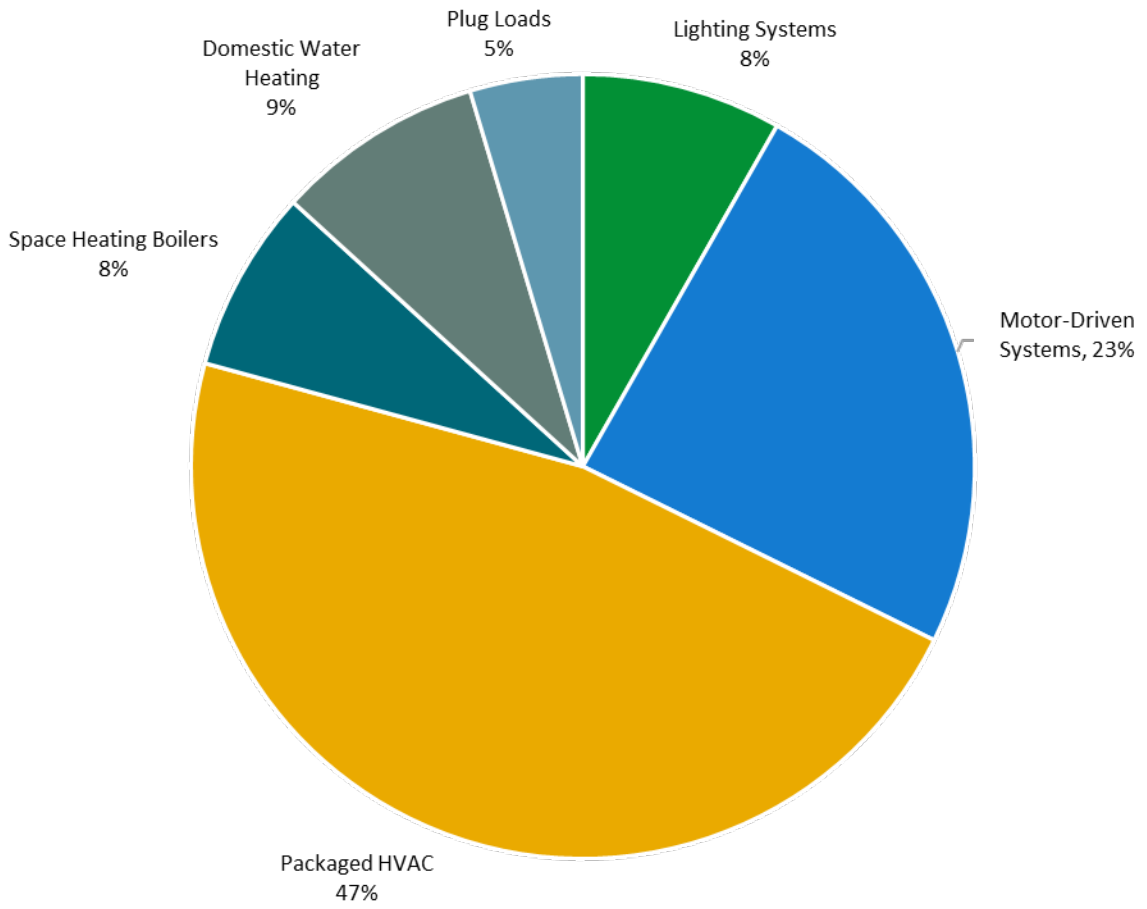
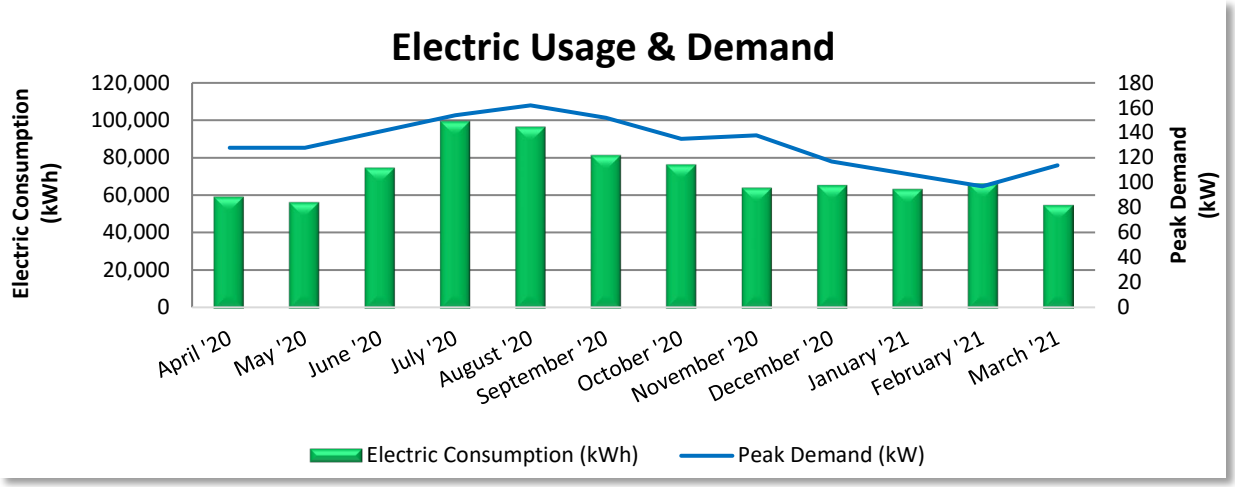


Figure 4 - Energy Balance

3.1 Electricity

City of Vineland delivers electricity under rate class Comm Service Rate GLP20 (Demand) Winter.



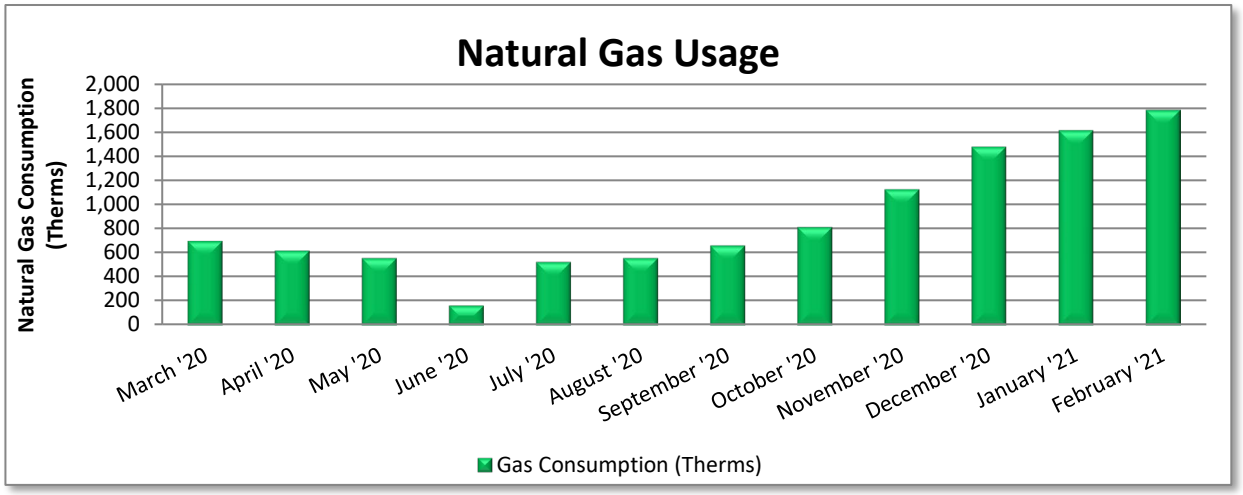
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
4/23/20	31	59,520	128	$1,312	$8,654
5/21/20	28	56,560	128	$1,312	$8,580
6/19/20	29	74,880	141	$1,481	$11,373
7/23/20	34	99,520	154	$1,617	$14,760
8/24/20	32	96,400	162	$1,701	$14,432
9/22/20	29	81,520	152	$1,596	$12,364
10/22/20	30	76,560	135	$1,384	$11,190
11/19/20	28	64,320	138	$1,415	$9,668
12/21/20	32	65,680	117	$1,199	$9,625
1/22/21	32	63,600	107	$1,097	$9,259
2/24/21	33	66,400	97	$994	$9,511
3/23/21	27	55,120	114	$1,169	$8,254
Totals	**365**	**860,080**	**162**	**$16,276**	**$127,671**
Annual	**365**	**860,080**	**162**	**$16,276**	**$127,671**

Notes:

- Peak demand of 162 kW occurred in August 2020.
- Average demand over the past 12 months was 131 kW.
- The average electric cost over the past 12 months was $0.148/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

South Jersey Gas delivers natural gas under rate class GSGMOBGSS.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
4/13/20	32	700	$956
5/12/20	29	619	$865
6/11/20	30	557	$820
7/15/20	34	165	$192
8/17/20	33	526	$594
9/16/20	30	557	$646
10/15/20	29	662	$813
11/16/20	32	812	$1,069
12/16/20	30	1,124	$1,497
1/14/21	29	1,477	$1,941
2/11/21	28	1,611	$2,175
3/12/21	29	1,782	$2,414
Totals	**365**	**10,592**	**$13,981**
Annual	**365**	**10,592**	**$13,981**

Notes:

- The average gas cost for the past 12 months is $1.320/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

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

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

Benchmarking Score	**N/A**

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

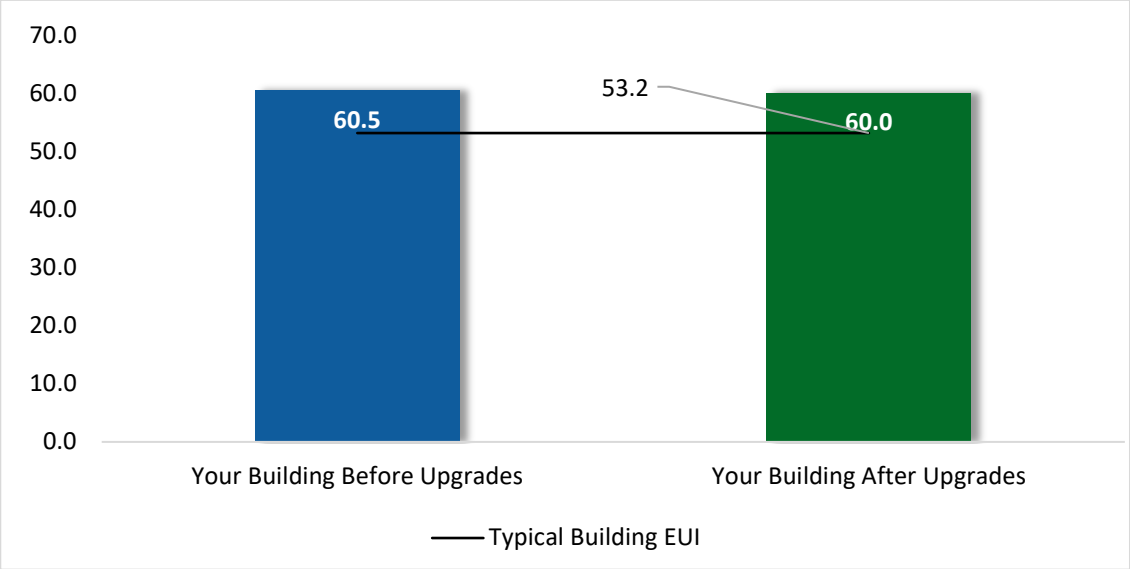


Figure 5 - Energy Use Intensity Comparison[3]

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)
Domestic Water Heating Upgrade			**0**	**0.0**	**25**	**$333**	**$694**	**$155**	**$539**	**1.6**	**2,957**
ECM 1	Install Low-Flow DHW Devices	Yes	0	0.0	25	$333	$694	$155	$539	1.6	2,957
Food Service & Refrigeration Measures			**1,954**	**0.2**	**0**	**$290**	**$460**	**$0**	**$460**	**1.6**	**1,968**
ECM 2	Vending Machine Control	Yes	1,954	0.2	0	$290	$460	$0	$460	1.6	1,968
TOTALS			**1,954**	**0.2**	**25**	**$623**	**$1,154**	**$155**	**$999**	**1.6**	**4,925**

* - 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)
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ECM 1	Install Low-Flow DHW Devices	0	0.0	25	$333	$694	$155	$539	1.6	2,957
Food Service & Refrigeration Measures		**1,954**	**0.2**	**0**	**$290**	**$460**	**$0**	**$460**	**1.6**	**1,968**
ECM 2	Vending Machine Control	1,954	0.2	0	$290	$460	$0	$460	1.6	1,968
TOTALS		**1,954**	**0.2**	**25**	**$623**	**$1,154**	**$155**	**$999**	**1.6**	**4,925**

* - 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 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**	**25**	**$333**	**$694**	**$155**	**$539**	**1.6**	**2,957**
ECM 1	Install Low-Flow DHW Devices	0	0.0	25	$333	$694	$155	$539	1.6	2,957

ECM 1: 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

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.

4.2 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**1,954**	**0.2**	**0**	**$290**	**$460**	**$0**	**$460**	**1.6**	**1,968**
ECM 2	Vending Machine Control	1,954	0.2	0	$290	$460	$0	$460	1.6	1,968

ECM 2: Vending Machine Control

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

5 Energy Efficient Best Practices

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

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.

Doors and Windows

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

Window Treatments/Coverings

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

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.

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

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

Lighting Controls

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

Motor Maintenance

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

Fans to Reduce Cooling Load

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

Economizer Maintenance

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

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time,

filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

Ductwork Maintenance

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

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

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

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

Boiler Maintenance

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

Furnace Maintenance

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

Label HVAC Equipment

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

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

Optimize HVAC Equipment Schedules

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

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

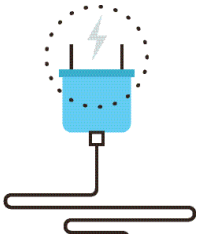
Water Heater Maintenance

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

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

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

Plug Load Controls



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

Water Conservation

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

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

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

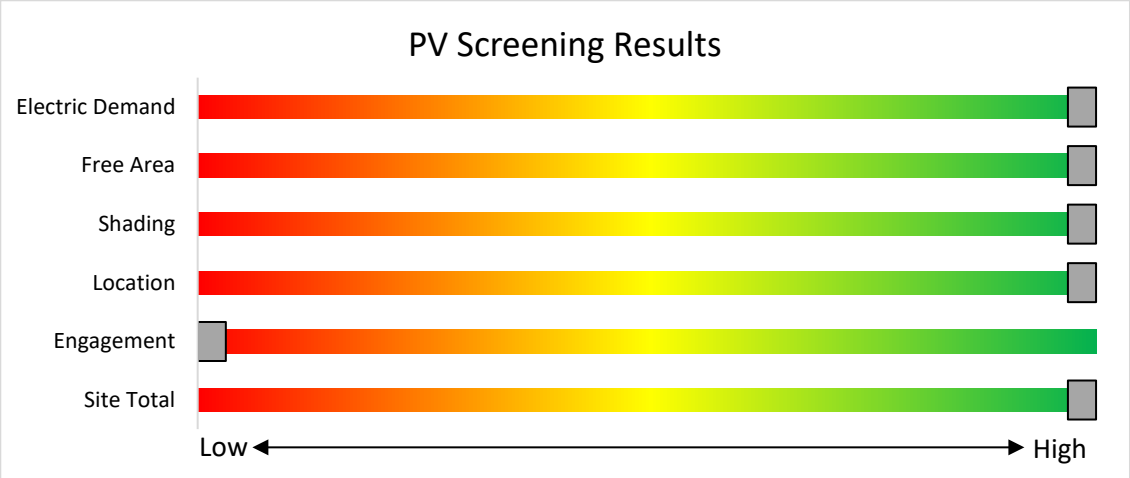
6.1 Solar Photovoltaic

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 high potential for installing a PV array.

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

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



Potential	High	
System Potential	107	kW DC STC
Electric Generation	127,477	kWh/yr
Displaced Cost	$18,920	/yr
Installed Cost	$278,200	

Figure 8 - Photovoltaic Screening

Successor Solar Incentive Program (SuSI)

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

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

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

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

6.2 Combined Heat and Power

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

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

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

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

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. The low or infrequent thermal load is 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.

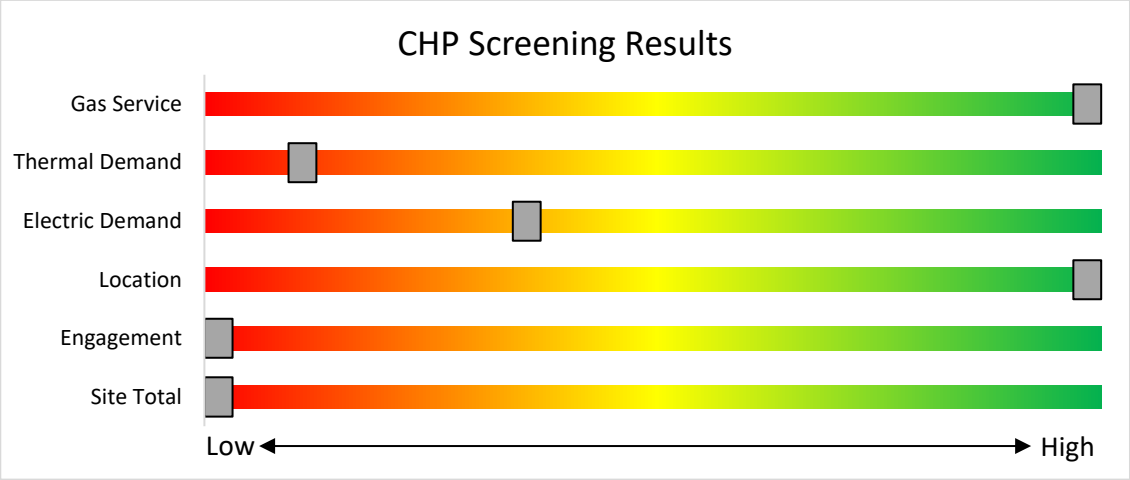


Figure 9 - Combined Heat and Power Screening

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

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

These new utility programs are rolling out in the spring and summer of 2021. Keep up to date with developments by visiting:

https://www.njcleanenergy.com/transition

8 New Jersey's Clean Energy Programs

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

8.1 Large Energy Users

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

Incentives

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

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

How to Participate

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

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

8.2 Combined Heat and Power

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

Incentives

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

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

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

How to Participate

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

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.

8.4 Energy Savings Improvement Program

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

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

How to Participate

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

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

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

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

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

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

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

9 PROJECT DEVELOPMENT

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

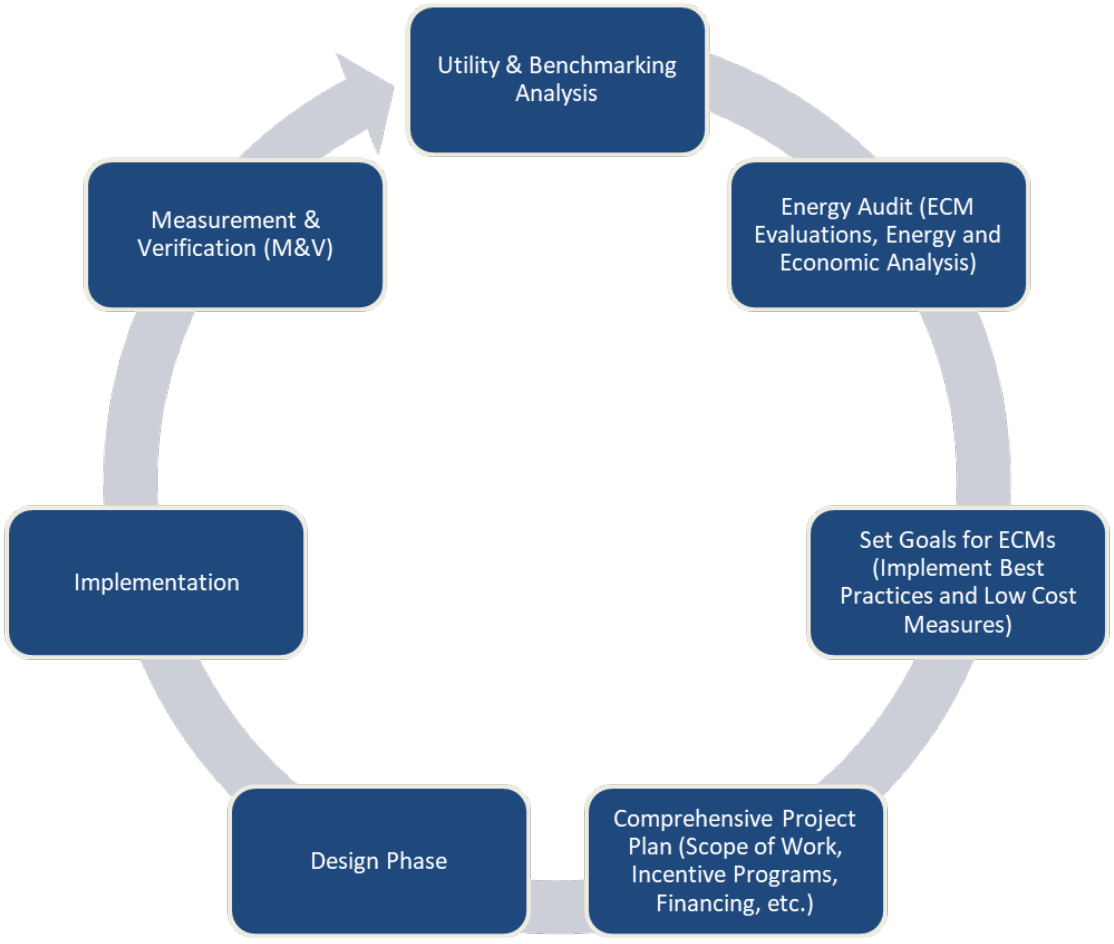


Figure 10 – Project Development Cycle

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].

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

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

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Anti crime unit	2	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	2	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Anti crime unit	27	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	27	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Basement	2	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	2	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Basement	83	LED - Linear Tubes: T8E-18W-2L-4ft	Daylight Dimming	S	36	6,814		None	No	83	LED - Linear Tubes: T8E-18W-2L-4ft	Daylight Dimming	36	6,814	0.0	0	0	$0	$0	$0	0.0
Corridor 2	3	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	3	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 2	7	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	7	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Detective Bureau	2	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	2	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Detective Bureau	27	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	27	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Entrance	1	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	1	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Entrance	5	LED - Linear Tubes: T8E-18W-4L-4ft	Occupancy Sensor	S	72	7,836		None	No	5	LED - Linear Tubes: T8E-18W-4L-4ft	Occupancy Sensor	72	7,836	0.0	0	0	$0	$0	$0	0.0
Evidence Office	2	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	2	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Evidence Office	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Evidence Office 2	2	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	2	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Evidence Office 2	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Evidence Office 3	1	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	1	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Evidence Office 3	18	LED - Linear Tubes: T8E-22W-1L-8ft	Occupancy Sensor	S	22	7,836		None	No	18	LED - Linear Tubes: T8E-22W-1L-8ft	Occupancy Sensor	22	7,836	0.0	0	0	$0	$0	$0	0.0
Exterior 1	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch		10	4,380		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	20	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Timeclock		60	4,380		None	No	20	LED - Fixtures: Large Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	60	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	4	LED - Linear Tubes: T8E-18W-1L-4ft	Timeclock		18	4,380		None	No	4	LED - Linear Tubes: T8E-18W-1L-4ft	Timeclock	18	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	2	LED - Fixtures: Wall Pack	Timeclock		35	4,380		None	No	2	LED - Fixtures: Wall Pack	Timeclock	35	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 1	2	LED - Fixtures: Wall Pack	None		75	4,380		None	No	2	LED - Fixtures: Wall Pack	None	75	4,380	0.0	0	0	$0	$0	$0	0.0
Female Restroom 1	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Garage 1	1	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	1	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Garage 1	10	LED - Linear Tubes: T8E-22W-1L-8ft	Occupancy Sensor	S	22	7,836		None	No	10	LED - Linear Tubes: T8E-22W-1L-8ft	Occupancy Sensor	22	7,836	0.0	0	0	$0	$0	$0	0.0
Interview room	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Interview room 2	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Interview room 3	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Interview room 4	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Locker Room 1 Female	6	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	6	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 1 Female	7	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	7	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Locker Room 1 Female	66	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	S	18	7,836		None	No	66	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	18	7,836	0.0	0	0	$0	$0	$0	0.0
Locker Room 1 Male	6	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	6	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 1 Male	7	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	7	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Locker Room 1 Male	6	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	S	18	7,836		None	No	6	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	18	7,836	0.0	0	0	$0	$0	$0	0.0
Main Hallway	7	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	7	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Main Hallway	3	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	S	10	7,836		None	No	3	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	7,836	0.0	0	0	$0	$0	$0	0.0
Main Hallway	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Main hallway 2	1	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	1	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Main hallway 2	6	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	6	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Male Restroom 1	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Process Room	2	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	2	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Process Room	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	S	35	8,736		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	35	8,736	0.0	0	0	$0	$0	$0	0.0
Process Room	3	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	S	18	7,836		None	No	3	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	18	7,836	0.0	0	0	$0	$0	$0	0.0
Reception	5	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	5	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Report Writing	1	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	1	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Report Writing	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Report Writing 2	1	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	1	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Report Writing 2	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Restroom - Unisex 1	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Restroom - Unisex 2	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Stairs 1	1	LED - Linear Tubes: T8E-18W-1L-4ft	Wall Switch		18	8,736		None	No	1	LED - Linear Tubes: T8E-18W-1L-4ft	Wall Switch	18	8,736	0.0	0	0	$0	$0	$0	0.0
Stairs 1 (1)	10	LED - Linear Tubes: T8E-18W-1L-4ft	Wall Switch		18	8,736		None	No	10	LED - Linear Tubes: T8E-18W-1L-4ft	Wall Switch	18	8,736	0.0	0	0	$0	$0	$0	0.0
Admin Suite	2	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	2	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Admin Suite	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Comm Center	4	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	4	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Comm Center	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Gymnasium 1	15	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	S	18	7,836		None	No	15	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	18	7,836	0.0	0	0	$0	$0	$0	0.0
Gymnasium 2	4	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	4	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Gymnasium 2	2	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	S	18	7,836		None	No	2	LED - Linear Tubes: T8E-18W-1L-4ft	Occupancy Sensor	18	7,836	0.0	0	0	$0	$0	$0	0.0
Internal Affairs	8	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	8	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Interview 5	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Main Hallway 2	6	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	6	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Main Hallway 2	5	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	S	10	7,836		None	No	5	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	7,836	0.0	0	0	$0	$0	$0	0.0
Main Hallway 2	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Patrol Division	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Restroom - Unisex 3	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Restroom - Unisex 4	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	1	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0
Training Room	2	Exit Signs: ExitSign-LED-2W-1L	None		2	8,760		None	No	2	Exit Signs: ExitSign-LED-2W-1L	None	2	8,760	0.0	0	0	$0	$0	$0	0.0
Training Room	26	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	S	35	7,836		None	No	26	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	35	7,836	0.0	0	0	$0	$0	$0	0.0

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Exterior	RTU-4	1	Supply Fan	7.5	91.0%	Yes	<not visible>	<not visible>	W	8,760		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-4	1	Exhaust Fan	5.0	89.5%	Yes	<not visible>	<not visible>	W	8,760		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-1	1	Supply Fan	5.0	89.5%	Yes	<not visible>	<not visible>	W	8,760		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-1	1	Exhaust Fan	3.0	89.5%	Yes	<not visible>	<not visible>	W	8,760		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-8	1	Supply Fan	2.0	86.5%	Yes	<not visible>	<not visible>	W	8,760		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-8	1	Exhaust Fan	1.0	85.5%	Yes	<not visible>	<not visible>	W	8,760		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-5	1	Supply Fan	2.0	86.5%	Yes	<not visible>	<not visible>	W	8,760		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-5	1	Exhaust Fan	1.0	85.5%	Yes	<not visible>	<not visible>	W	8,760		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-9	1	Supply Fan	3.0	89.5%	Yes	<not visible>	<not visible>	W	8,760		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-9	1	Exhaust Fan	3.0	89.5%	Yes	<not visible>	<not visible>	W	8,760		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-7	1	Supply Fan	1.0	85.5%	Yes	<not visible>	<not visible>	W	8,760		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-7	1	Exhaust Fan	1.0	85.5%	Yes	<not visible>	<not visible>	W	8,760		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-6	1	Supply Fan	3.0	89.5%	Yes	<not visible>	<not visible>	W	8,760		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-6	1	Exhaust Fan	2.0	86.5%	Yes	<not visible>	<not visible>	W	8,760		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-3	1	Supply Fan	5.0	89.5%	Yes	<not visible>	<not visible>	W	8,760		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-3	1	Exhaust Fan	3.0	89.5%	Yes	<not visible>	<not visible>	W	8,760		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-2	1	Supply Fan	2.0	86.5%	Yes	<not visible>	<not visible>	W	8,760		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-2	1	Exhaust Fan	1.0	85.5%	Yes	<not visible>	<not visible>	W	8,760		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Basement	Boilers	2	Heating Hot Water Pump	1.5	86.5%	Yes	Armstrong	4001513-064	W	5,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Basement	Boilers	2	Heating Hot Water Pump	5.0	86.5%	Yes	Marathon	UVH 152TTDBD6007 BB1	W	5,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Basement	AHU	1	Supply Fan	1.5	86.5%	Yes	Trane	UCCAG03C0C0EUA33	W	5,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Garage	Unit Heater	1	Supply Fan	0.3	65.0%	No	<not visible>	<not visible>	W	4,380		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	Exhaust Fan	1	Exhaust Fan	0.3	85.0%	No	Greenheck	6-098-A-X	W	2,745		No	85.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior	Exhaust Fan	1	Exhaust Fan	0.3	85.0%	No	Greenheck	6B-091-4-X	W	2,745		No	85.0%	No		0.0	0	0	$0	$0	$0	0.0
Basement	Elevator Motor	1	Other	25.0	75.5%	No	Nidec Motor Corp.	A027708996-0002M0004	W	730		No	75.5%	No		0.0	0	0	$0	$0	$0	0.0
Garage	Garage doors	2	Other	3.0	70.0%	No	<not visible>	<not visible>	W	548		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Basement	DHW Circ. Pump	2	DHW Circulation Pump	0.2	65.0%	No	Bell & Gossett	LR-15BWR	W	8,760		No	65.0%	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
Exterior	RTU-4	1	Package Unit	16.00	218.70	18.30	0.81 AFUE	AAON	RN-016-3-0-EA09-344	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-1	1	Package Unit	11.00	156.00	18.80	0.8 AFUE	AAON	RN-011-3-0-EA09-3FB	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-8	1	Package Unit	10.00	168.00	17.20	0.8 AFUE	AAON	RN-010-3-0-EA09-3LB	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-5	1	Package Unit	4.00	49.00	17.40	0.8166666666666667 AFUE	AAON	RQ-004-3-V-EA09-31B	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-9	1	Package Unit	10.00	72.90	17.20	0.81 AFUE	AAON	RN-010-3-0-EA09-32B	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-7	1	Package Unit	4.00	49.00	17.40	0.8166666666666667 AFUE	AAON	RQ-004-3-V-EA09-31B	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-6	1	Package Unit	15.00	156.00	20.20	0.8 AFUE	AAON	RN-015-3-0-EA09-3F4	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-3	1	Package Unit	13.00	156.00	17.60	0.8 AFUE	AAON	RN-013-3-0-EA09-3F5	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	RTU-2	1	Package Unit	7.00	72.90	18.80	0.81 AFUE	AAON	RN-007-3-0-EA09-32B	W		No							0.0	0	0	$0	$0	$0	0.0
Garage	Unit Heater	1	Unit Heater		N/A			Vulcan	<not visible>	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	Condesing unit	1	Split-System	5.00		17.00		Trane	4TTA7060A4000AA	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior	Condesing unit	1	Ductless Mini-Split AC	10.00	135.00	14.00	0.8 AFUE	Mitsubishi	PURY-P120TLMU-A	W		No							0.0	0	0	$0	$0	$0	0.0
Server Room	Mini-Split	1	Ductless Mini-Split AC	1.00	135.00	14.00	0.8 AFUE	Mitsubishi	PKFY-P12NHMU-E2	W		No							0.0	0	0	$0	$0	$0	0.0
Basement	Various	1	Split-System	16.00		17.00		Stulz	SCS-MC-056-DEC-02	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
Basement	Police Station	2	Condensing Hot Water Boiler	472	Aerco Int.	1C6M0D225	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
Basement	Police Station	2	Storage Tank Water Heater (> 50 Gal)	Bradford White Corporation	EF100T199E3N2	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
Evidence Offices	1	5	Faucet Aerator (Kitchen)	2.20	1.50	0.0	0	2	$26	$36	$10	1.0
Process Room	1	1	Faucet Aerator (Kitchen)	2.20	1.50	0.0	0	0	$5	$7	$2	1.0
Admin Suite	1	1	Faucet Aerator (Kitchen)	2.20	1.50	0.0	0	0	$5	$7	$2	1.0
Comm Center	1	1	Faucet Aerator (Kitchen)	2.20	1.50	0.0	0	0	$5	$7	$2	1.0
Main Hallway 2	1	1	Faucet Aerator (Kitchen)	2.20	1.50	0.0	0	0	$5	$7	$2	1.0
Corridor 2	1	1	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	1	$13	$7	$4	0.3
Restrooms	1	12	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	11	$150	$86	$43	0.3
Locker Rooms	1	6	Showerhead	2.50	1.50	0.0	0	9	$124	$536	$90	3.6

Plug Load Inventory

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
Anti crime unit	1	Coffee Machine	900	No		
Corridor 2	6	Coffee Machine	900	No		
Detective Bureau	1	Coffee Machine	900	No		
Evidence Office	1	Coffee Machine	900	No		
Evidence Office 2	1	Coffee Machine	900	No		
Comm Center	1	Coffee Machine	900	No		
Internal Affairs	1	Coffee Machine	900	No		
Anti crime unit	21	Desktop	145	No		
Corridor 2	4	Desktop	145	No		
Detective Bureau	21	Desktop	145	No		
Evidence Office	11	Desktop	145	No		
Evidence Office 2	2	Desktop	145	No		
Evidence Office 3	2	Desktop	145	No		
Process Room	1	Desktop	145	No		
Reception	3	Desktop	145	No		
Report Writing	2	Desktop	145	No		
Report Writing 2	2	Desktop	145	No		
Admin Suite	1	Desktop	145	No		
Comm Center	56	Desktop	145	No		
Internal Affairs	6	Desktop	145	No		
Interview 5	1	Desktop	145	No		
Patrol Division	2	Desktop	145	No		
Training Room	1	Desktop	145	No		
Anti crime unit	1	Microwave	900	No		
Basement	1	Microwave	900	No		
Corridor 2	6	Microwave	900	No		
Detective Bureau	1	Microwave	900	No		
Evidence Office	1	Microwave	900	No		
Evidence Office 2	1	Microwave	900	No		
Admin Suite	1	Microwave	900	No		
Comm Center	1	Microwave	900	No		
Main Hallway 2	1	Microwave	900	No		
Process Room	2	Printer (Medium/Small)	100	No		
Corridor 2	1	Printer/Copier (Large)	250	No		
Evidence Office	1	Printer/Copier (Large)	250	No		

	Existing Conditions					
Location	**Quantity**	**Equipment Description**	**Energy Rate (W)**	**ENERGY STAR Qualified?**	**Manufacturer**	**Model**
Reception	1	Printer/Copier (Large)	250	No		
Admin Suite	1	Printer/Copier (Large)	250	No		
Comm Center	1	Printer/Copier (Large)	250	No		
Internal Affairs	1	Printer/Copier (Large)	250	No		
Anti crime unit	3	Refrigerator (Mini)	60	No		
Corridor 2	6	Refrigerator (Mini)	60	No		
Detective Bureau	3	Refrigerator (Mini)	60	No		
Evidence Office	1	Refrigerator (Mini)	60	No		
Evidence Office 2	3	Refrigerator (Mini)	60	No		
Evidence Office 3	2	Refrigerator (Mini)	60	No		
Admin Suite	2	Refrigerator (Mini)	60	No		
Comm Center	2	Refrigerator (Mini)	60	No		
Internal Affairs	1	Refrigerator (Mini)	60	No		
Basement	1	Refrigerator (Residential)	200	No		
Evidence Office 3	6	Refrigerator (Residential)	200	No		
Main Hallway 2	1	Refrigerator (Residential)	200	No		
Corridor 2	3	Television	80	No		
Entrance	2	Television	80	No		
Evidence Office 3	1	Television	80	No		
Main hallway 2	1	Television	80	No		
Process Room	1	Television	80	No		
Admin Suite	1	Television	80	No		
Comm Center	1	Television	80	No		
Gymnasium 2	3	Television	80	No		
Main Hallway 2	1	Television	80	No		
Training Room	2	Television	80	No		
Basement	1	Toaster Oven	1,200	No		
Corridor 2	1	Toaster Oven	1,200	No		
Anti crime unit	1	Water Cooler	250	No		
Corridor 2	2	Water Cooler	250	No		
Detective Bureau	1	Water Cooler	250	No		
Evidence Office	1	Water Cooler	250	No		
Evidence Office 2	1	Water Cooler	250	No		
Comm Center	1	Water Cooler	250	No		
Main Hallway 2	1	Water Cooler	250	No		

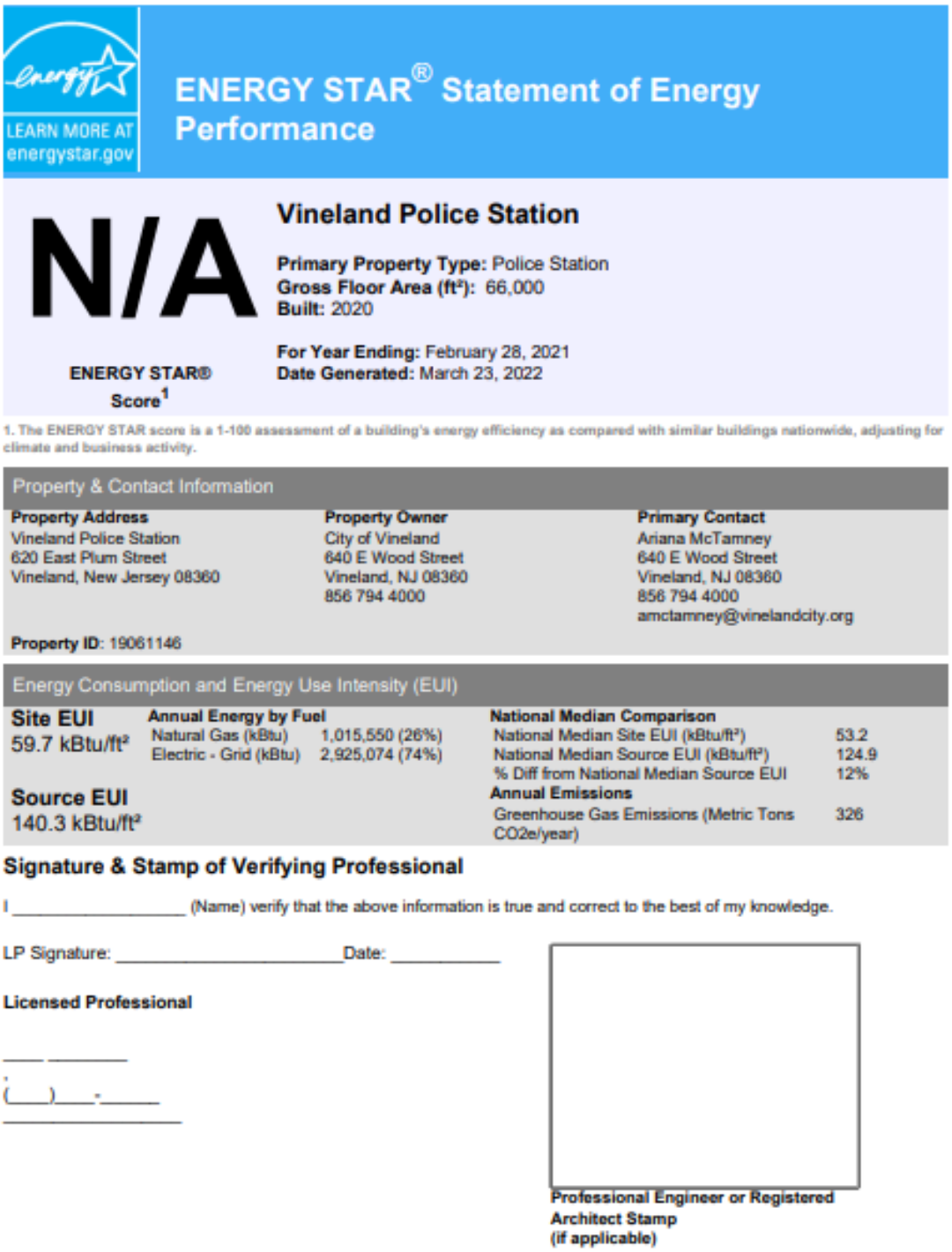
	Existing Conditions					
Location	**Quantity**	**Equipment Description**	**Energy Rate (W)**	**ENERGY STAR Qualified?**	**Manufacturer**	**Model**
Main Hallway	1	Bio-Refrigerator	400	No		
Main Hallway 2	1	Bio-Refrigerator	400	No		

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Main Hallway 2	1	Non-Refrigerated	2	Yes	0.0	343	0	$51	$230	$0	4.5
Main Hallway 2	1	Refrigerated	2	Yes	0.2	1,612	0	$239	$230	$0	1.0

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]

Vineland Police Station

Primary Property Type: Police Station
Gross Floor Area (ft²): 66,000
Built: 2020

For Year Ending: February 28, 2021
Date Generated: March 23, 2022

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Vineland Police Station 620 East Plum Street Vineland, New Jersey 08360	City of Vineland 640 E Wood Street Vineland, NJ 08360 856 794 4000	Ariana McTamney 640 E Wood Street Vineland, NJ 08360 856 794 4000 amctamney@vinelandcity.org

Property ID: 19061146

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
59.7 kBtu/ft²

Source EUI
140.3 kBtu/ft²

Annual Energy by Fuel		National Median Comparison	
Natural Gas (kBtu)	1,015,550 (26%)	National Median Site EUI (kBtu/ft²)	53.2
Electric - Grid (kBtu)	2,925,074 (74%)	National Median Source EUI (kBtu/ft²)	124.9
		% Diff from National Median Source EUI	12%
		Annual Emissions	
		Greenhouse Gas Emissions (Metric Tons CO2e/year)	326

Signature & Stamp of Verifying Professional

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

LP Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-____
_____

Professional Engineer or Registered Architect Stamp (if applicable)

APPENDIX C: GLOSSARY

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

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

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