


Local Government Energy Audit Report

Showers and Pumphouses

July 23, 2024

Prepared for:

Cheesequake State Park
300 Gordon Road
Matawan, New Jersey 07747

Prepared by:

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Disclaimer

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

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

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

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

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

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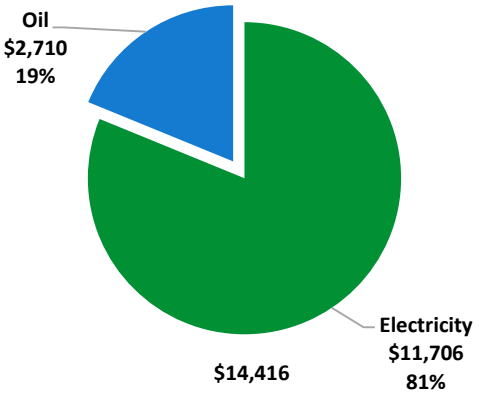
1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Showers and Pumphouses. 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: $14,416 Electricity: 57,349 kWh No. 2 Fuel Oil: 882 Gallons	
ENERGY STAR® Benchmarking Score	N/A *(1-100 scale)*	A standard energy use benchmark is not available for this facility type. This report contains suggestions about how to improve building performance and reduce energy costs.

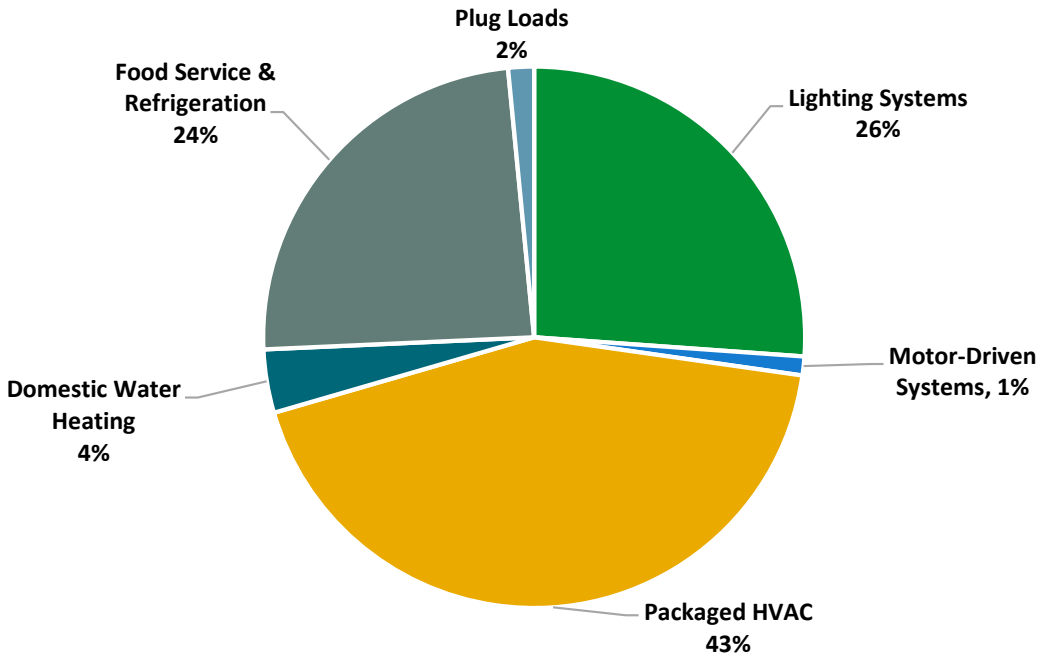


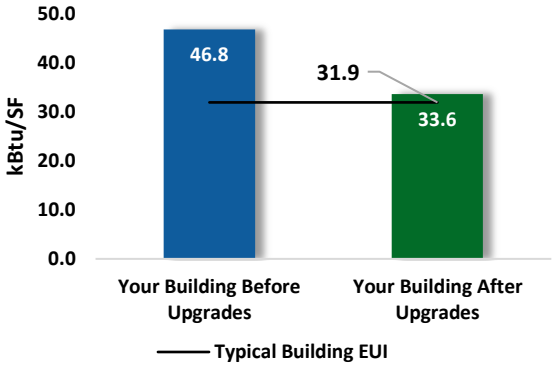
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

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

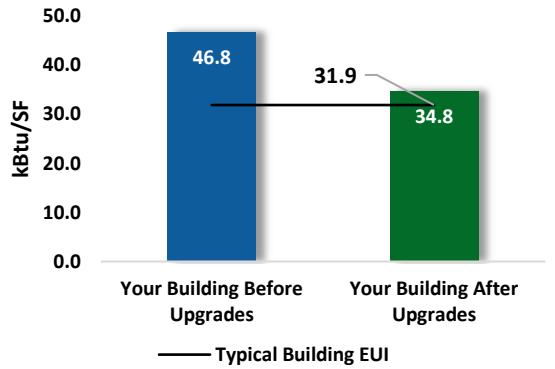
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$31,789
Potential Rebates & Incentives[1]	$2,718
Annual Cost Savings	$4,756
Annual Energy Savings	Electricity: 21,551 kWh No. 2 Fuel Oil: 116 Gallons
Greenhouse Gas Emission Savings	12 Tons
Simple Payback	6.1 Years
Site Energy Savings (All Utilities)	28%



Scenario 2: Cost Effective Package[2]

Installation Cost	$19,265
Potential Rebates & Incentives	$2,718
Annual Cost Savings	$4,282
Annual Energy Savings	Electricity: 19,231 kWh No. 2 Fuel Oil: 116 Gallons
Greenhouse Gas Emission Savings	11 Tons
Simple Payback	3.9 Years
Site Energy Savings (all utilities)	26%



On-site Generation Potential

Photovoltaic	None
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**16,574**	**4.2**	**-5**	**$3,280**	**$8,758**	**$1,446**	**$7,312**	**2.2**	**15,930**
ECM 1	Install LED Fixtures	Yes	5,676	0.0	0	$1,159	$3,152	$600	$2,552	2.2	5,716
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	7,742	3.1	-3	$1,507	$4,475	$670	$3,805	2.5	7,257
ECM 3	Retrofit Fixtures with LED Lamps	Yes	3,155	1.2	-1	$614	$1,131	$176	$955	1.6	2,957
Lighting Control Measures			**1,759**	**0.6**	**-1**	**$343**	**$2,700**	**$350**	**$2,350**	**6.9**	**1,649**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	1,759	0.6	-1	$343	$2,700	$350	$2,350	6.9	1,649
Motor Upgrades			**128**	**0.0**	**0**	**$26**	**$1,330**	**$0**	**$1,330**	**50.9**	**129**
ECM 5	Premium Efficiency Motors	No	128	0.0	0	$26	$1,330	$0	$1,330	50.9	129
Unitary HVAC Measures			**162**	**0.1**	**0**	**$33**	**$942**	**$0**	**$942**	**28.6**	**163**
ECM 6	Install High Efficiency Air Conditioning Units	No	162	0.1	0	$33	$942	$0	$942	28.6	163
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**21**	**$476**	**$5,486**	**$500**	**$4,986**	**10.5**	**3,512**
ECM 7	Install High Efficiency Furnaces	Yes	0	0.0	21	$476	$5,486	$500	$4,986	10.5	3,512
Domestic Water Heating Upgrade			**693**	**0.0**	**0**	**$141**	**$2,019**	**$382**	**$1,637**	**11.6**	**698**
ECM 8	Install Low-Flow DHW Devices	Yes	693	0.0	0	$141	$2,019	$382	$1,637	11.6	698
Food Service & Refrigeration Measures			**205**	**0.0**	**0**	**$42**	**$303**	**$40**	**$263**	**6.3**	**206**
ECM 9	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	205	0.0	0	$42	$303	$40	$263	6.3	206
Custom Measures			**2,030**	**0.0**	**0**	**$415**	**$10,251**	**$0**	**$10,251**	**24.7**	**2,044**
ECM 10	Replace Electric Water Heater with Heat Pump Water Heater	No	2,030	0.0	0	$415	$10,251	$0	$10,251	24.7	2,044
TOTALS (COST EFFECTIVE MEASURES)			**19,231**	**4.9**	**16**	**$4,282**	**$19,265**	**$2,718**	**$16,548**	**3.9**	**21,996**
TOTALS (ALL MEASURES)			**21,551**	**5.1**	**16**	**$4,756**	**$31,789**	**$2,718**	**$29,071**	**6.1**	**24,332**

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

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

Figure 2 – Evaluated Energy Improvements

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

1.1 Planning Your Project

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

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

Pick Your Installation Approach

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

Options from Your Utility Company

Prescriptive and Custom Rebates

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the Prescriptive and Custom Rebates program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval may be required for some incentives. Contact your utility company for more details prior to project installation.

Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized contractor. This program can provide incentives up to 70% or 80% of the cost of selected measures. A Direct Install contractor will assess and verify individual measure eligibility and perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Engineered Solutions

The Engineered Solutions program provides tailored energy-efficiency assistance and turnkey engineering services to municipalities, universities, schools, hospitals, and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. The program provides all professional services from audit, design, construction administration, to commissioning and measurement and verification for custom whole-building energy-efficiency projects. Engineered Solutions allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs.

For more details on these programs please contact your utility provider.

Options from New Jersey's Clean Energy Program

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

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

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

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

Successor Solar Incentive Program (SuSI)

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

Ongoing Electric Savings with Demand Response

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

Large Energy User Program (LEUP)

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

For more details on these programs please visit New Jersey's Clean Energy Program website .

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Showers and Pumphouses. 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 November 13, 2024, TRC performed an energy audit at the Bathhouse Showers, Family Campsite Showers, the Bathhouse Pumphouse, and the Chlorination Pump Station located in Matawan, New Jersey. TRC met with Jonathan Luk to review the facility operations and help focus our investigation on specific energy-using systems.

The bathhouse shower, family campsite showers, bathhouse pumphouse, and chlorination pump Station buildings are single-story buildings with a total 6,795 square foot. Spaces include lifeguard rooms, storage rooms, snack shacks, showers, restrooms, pump rooms, and mechanical spaces. The bathhouse shower is 20% cooled by one window AC unit and no heating is present. The family campsite shower is heated by a forced hot air furnace and electric resistance heat with no cooling present on site. The bathhouse pumphouse and the chlorination pump station have no heating or cooling equipment.

2.2 Building Occupancy

The bathhouse pumphouse is occupied all week from Memorial Day weekend through Labor Day weekend. There are few full-time staff and intermittent public visits. The bathhouse pumphouse and the chlorination pump station are open continuously and are occupied as needed for maintenance.

Building Name	Weekday/Weekend	Operating Schedule
Bathhouse Shower	Weekday	8:00 AM - 8:30 PM
	Weekend	8:00 AM - 8:30 PM
Family Campsite Shower	Weekday	8:00 AM - 8:30 PM
	Weekend	8:00 AM - 8:30 PM
Bathhouse Pumphouse	Weekday	12:00 AM - 12:00 AM
	Weekend	12:00 AM - 12:00 AM
Chlorination Pump Station	Weekday	12:00 AM - 12:00 AM
	Weekend	12:00 AM - 12:00 AM

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

The bathhouse shower building exterior is made of concrete masonry units (CMUs) and is in fair condition. The building roof is a pitched wood deck clad in asphalt shingles. The roof is new and in good condition. The windows are single pane and in fair condition. Facility doors are solid metal with metal frames and are in good condition.

The family campsite shower building exterior is made of wooden panels with a pitched roof clad in asphalt shingles. Windows are on the upper level are single pane and inoperable. The exterior doors are metal and in good condition.

The building exterior for the bathhouse pumphouse and the chlorination pumphouse are made of wooden panels, both equipped with a pitched roof clad in asphalt shingles. There are no windows in these buildings. The exterior doors are metal and in good condition.

Family Campsite Shower Envelope

Bathhouse Shower

Chlorination Pumphouse

Bathhouse Pumphouse

2.4 Lighting Systems

The primary interior lighting system for the bathhouse shower uses 40-Watt T12 linear fluorescent lamps and 32-Watt T8 linear fluorescent lamps. Fixture types include 4-foot and 8-foot-long troffers and surface mounted fixtures with 2-lamp and 4-lamp fixtures. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use less efficient magnetic ballasts. Additional lamps include incandescent and compact fluorescent lamps (CFL) serving smaller spaces such as the restrooms.

All exit signs are 2-Watt LED units. Exterior lighting is made of 100-Watt high-pressure sodium (HPS) wall pack fixtures. Interior lighting is controlled by wall switches and exterior lighting are on a time clock.

The family campsite shower primary interior lighting is provided by 43-Watt incandescent lamp fixtures and 26-Watt CFLs. Exit signs are up to date with 2-Watt LED fixtures. Exterior lighting is provided by 100-Watt high-pressure sodium wall pack fixtures. Interior lighting is controlled by wall switches and exterior lighting are on a time clock.

Both pumphouses are lit by 26-Watt CFLs and/or 43-Watt incandescent lamp fixtures controlled by wall switches. The bathhouse pumphouse is still utilized; however, the chlorination pump station is no longer in use and no electrical consuming equipment runs on site.

Bathhouse Shower: 8-foot Linear Fluorescent T12

2-Watt LED Exit Sign

Family Campsite Shower: 4-foot Linear Fluorescent T8

Bathhouse Shower: High-Pressure Sodium Exterior Fixtures

Chlorination Pumphouse: CFL Fixture

Bathhouse Pumphouse: CFL Fixture

2.5 Air Handling Systems

Unitary Electric HVAC Equipment

The bathhouse shower building has a window AC unit in the lifeguard room. The unit does not have a nameplate and has been estimated as a 1.0-ton unit. The unit is beyond its useful life and has been evaluated for replacement.

Bathhouse Shower: Window AC Unit

Unitary Heating Equipment

The family campsite shower is heated using an No.2 oil-fired furnace and electric resistance heaters.

The oil-fired forced hot air furnace has a heating capacity of 200 MBh operating at a nominal efficiency of 80%. It is beyond its useful life and has been evaluated for replacement. A fractional horsepower Marathon Electric combustion air fan serves the unit and is operating beyond its rated useful life.

An electric resistance heater with a capacity of 5 kW serves the mechanical room.

Family Campsite Shower: Furnace

Family Campsite Shower: Electric Resistance Heater

2.6 Domestic Hot Water

The bathhouse shower and the family campsite shower buildings are equipped with domestic hot water heaters.

The family campsite shower building has one electric water heater with an input capacity of 4.5 kW and a tank capacity of 119 gallons. The unit is in good condition and is operating within its rated useful life.

The bathhouse shower building has two, 65-gallon electric water heater with an input capacity of 12 kW and two, 6-gallon water heaters with an input capacity of 1.65 kW. All four units are in good condition and are operating within their rated useful life.

Bathhouse Shower 65-gallon Water Heater

Family Campsite Water Heater

2.7 Food Service Equipment

The snack shack kitchen at the bathhouse shower has all electric equipment that is used to prepare meals. Most cooking is done using a griddle and a fryer. Equipment is high efficiency and in good condition.

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

Bathhouse Shower Snack Shack: Griddle

Bathhouse Shower Snack Shack: Fryer

2.8 Refrigeration

The kitchen has several stand-up refrigerators with either solid or glass doors and a refrigerator chest. All equipment is standard efficiency and in good condition.

The walk-in medium temperature freezer has a 0.5-ton compressor located in the snack shack and a 25-Watt fan evaporator. A measure to install electronically commutated evaporator fan motors has been evaluated.

Our analysis determined that this building's refrigeration equipment accounts for a relatively high proportion of overall energy use. While cost effective opportunities to replace equipment are limited at this time, we recommend that you work with your refrigeration suppliers to maintain equipment in a way that minimizes energy use. When refrigeration equipment does need to be replaced consider installing high efficiency or ENERGY STAR labeled equipment.

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

Walk-in Freezer

Refrigerator Chest

2.9 Plug Load and Vending Machines

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

Plug loads include fans, microwave ovens and, residential-style refrigerators in the bathhouse shower building.

Microwave Oven

2.10 Water-Using Systems

Kitchen and lavatory faucet flow rates are rated at 1.8 gallons per minute (gpm) and showerheads are rated at 1.5 gpm. The installation of low-flow measures has been evaluated.

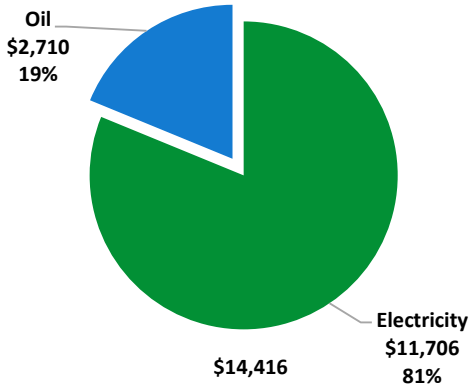
Family Campsite Shower: Sink

Bathhouse Shower: Sink

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	57,349 kWh	$11,706
No. 2 Fuel Oil	882 Gallons	$2,710
Total		**$14,416**



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.

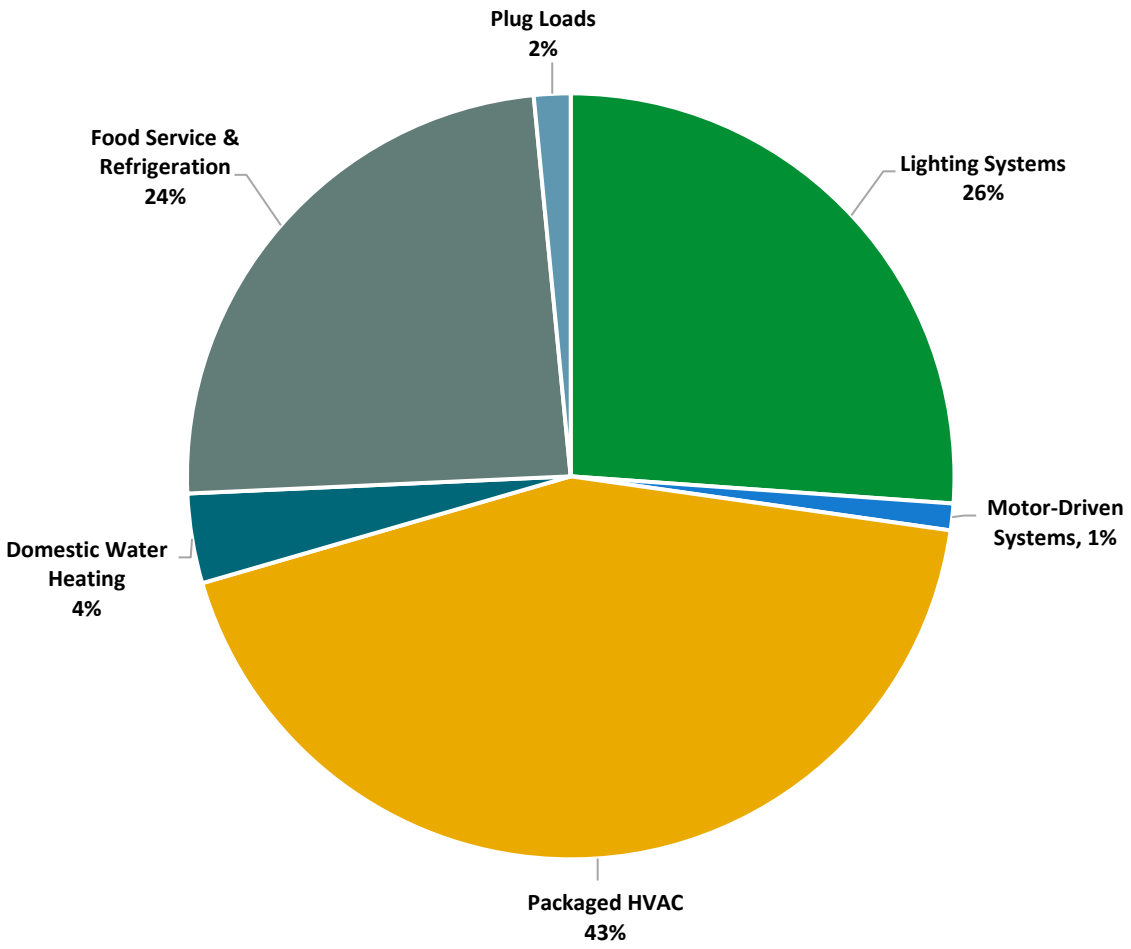
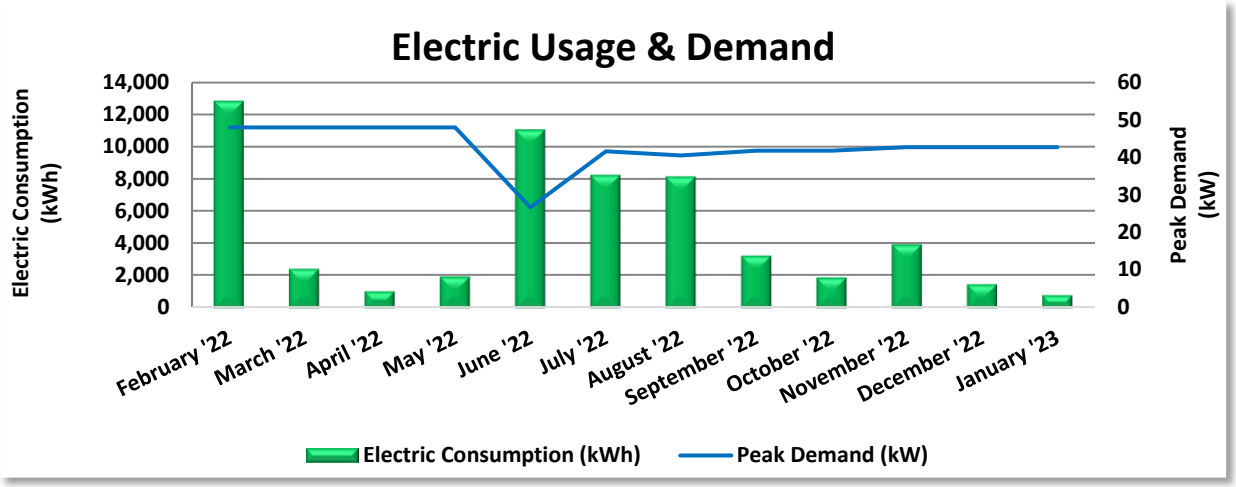


Figure 4 - Energy Balance

3.1 Electricity

JCP&L delivers electricity under rate class General Service Secondary JC_GS1_01D, with electric production provided by Champion Energy Services, a third-party supplier.



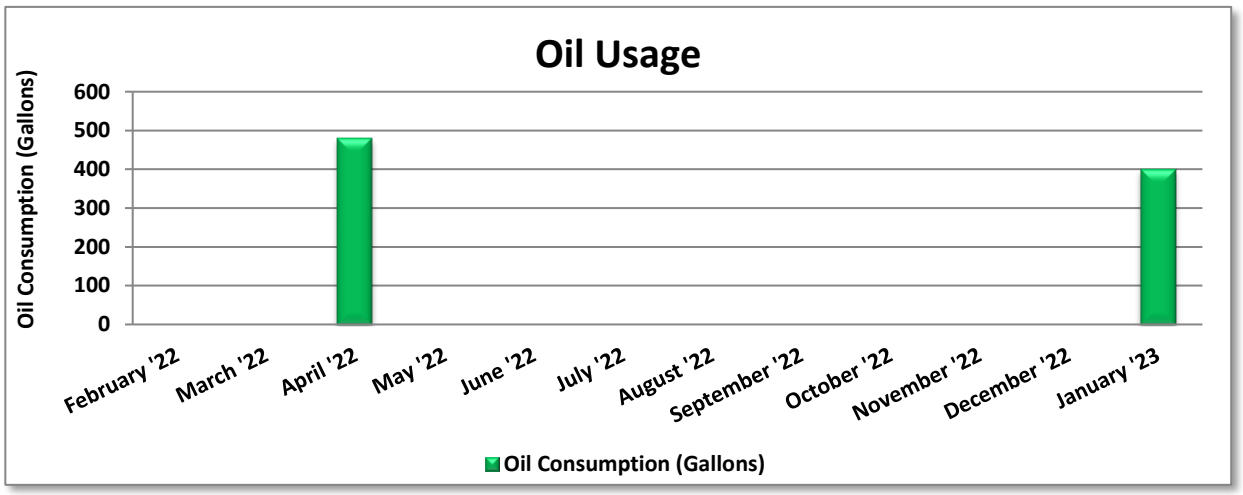
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
2/11/22	28	12,834	48	$172	$2,311
3/14/22	31	2,443	48	$172	$591
4/13/22	30	1,057	48	$172	$402
5/16/22	33	1,975	48	$172	$569
6/13/22	28	11,050	27	$164	$1,708
7/15/22	32	8,260	42	$313	$1,574
8/16/22	32	8,147	41	$304	$1,551
9/15/22	30	3,260	42	$150	$766
10/14/22	29	1,906	42	$150	$536
11/10/22	27	3,960	43	$171	$851
12/13/22	33	1,493	43	$163	$464
1/13/23	31	807	43	$153	$351
Totals	**364**	**57,192**	**48**	**$2,258**	**$11,674**
Annual	**365**	**57,349**	**48**	**$2,264**	**$11,706**

Notes:

- Peak demand of 48 kW occurred in February '22.
- Average demand over the past 12 months was 43 kW.
- The average electric cost over the past 12 months was $0.204/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 No. 2 Fuel Oil

J Swanton Fuel Oil Co delivers no. 2 fuel oil to the project site.



No. 2 Fuel Oil Billing Data			
Period Ending	**Days in Period**	**Oil Usage (Gallons)**	**Fuel Cost**
2/11/22	28	0	$0
3/14/22	31	0	$0
4/13/22	30	480	$1,284
5/16/22	33	0	$0
6/13/22	28	0	$0
7/15/22	32	0	$0
8/16/22	32	0	$0
9/15/22	30	0	$0
10/14/22	29	0	$0
11/10/22	27	0	$0
12/13/22	33	0	$0
1/13/23	31	400	$1,419
Totals	**364**	**880**	**$2,703**
Annual	**365**	**882**	**$2,710**

Notes:

- The average no. 2 fuel oil cost for the past 12 months is $3.071/Gallon, which is the blended rate used throughout the analysis.
- Fuel deliveries do not necessarily correspond to periods of use.

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.

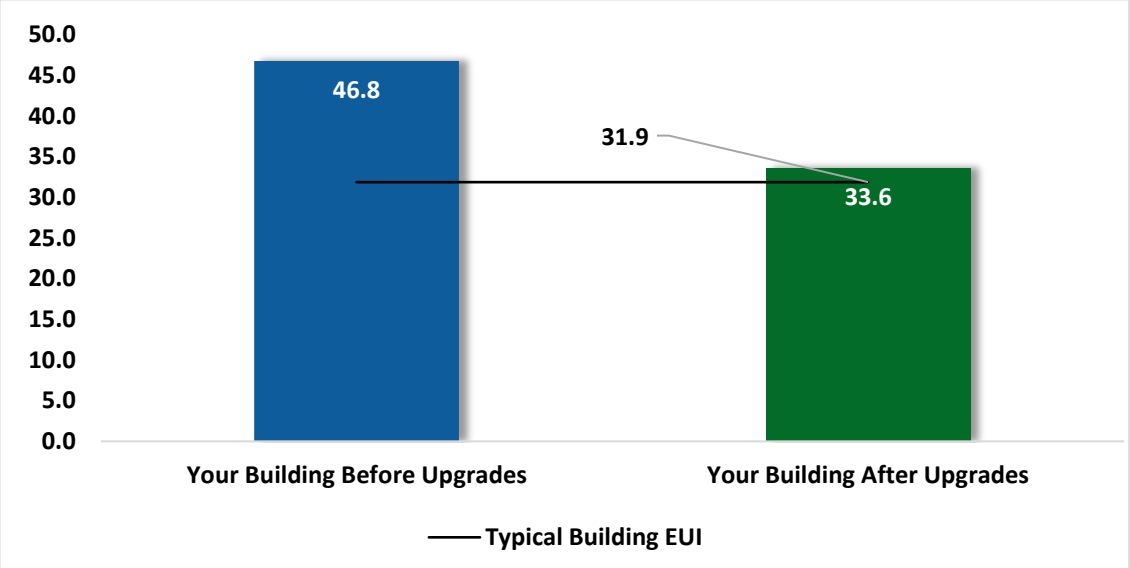


Figure 5 - Energy Use Intensity Comparison[3]

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 have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

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

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

4 Energy Conservation Measures

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

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

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

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

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**16,574**	**4.2**	**-5**	**$3,280**	**$8,758**	**$1,446**	**$7,312**	**2.2**	**15,930**
ECM 1	Install LED Fixtures	Yes	5,676	0.0	0	$1,159	$3,152	$600	$2,552	2.2	5,716
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	7,742	3.1	-3	$1,507	$4,475	$670	$3,805	2.5	7,257
ECM 3	Retrofit Fixtures with LED Lamps	Yes	3,155	1.2	-1	$614	$1,131	$176	$955	1.6	2,957
Lighting Control Measures			**1,759**	**0.6**	**-1**	**$343**	**$2,700**	**$350**	**$2,350**	**6.9**	**1,649**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	1,759	0.6	-1	$343	$2,700	$350	$2,350	6.9	1,649
Motor Upgrades			**128**	**0.0**	**0**	**$26**	**$1,330**	**$0**	**$1,330**	**50.9**	**129**
ECM 5	Premium Efficiency Motors	No	128	0.0	0	$26	$1,330	$0	$1,330	50.9	129
Unitary HVAC Measures			**162**	**0.1**	**0**	**$33**	**$942**	**$0**	**$942**	**28.6**	**163**
ECM 6	Install High Efficiency Air Conditioning Units	No	162	0.1	0	$33	$942	$0	$942	28.6	163
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**21**	**$476**	**$5,486**	**$500**	**$4,986**	**10.5**	**3,512**
ECM 7	Install High Efficiency Furnaces	Yes	0	0.0	21	$476	$5,486	$500	$4,986	10.5	3,512
Domestic Water Heating Upgrade			**693**	**0.0**	**0**	**$141**	**$2,019**	**$382**	**$1,637**	**11.6**	**698**
ECM 8	Install Low-Flow DHW Devices	Yes	693	0.0	0	$141	$2,019	$382	$1,637	11.6	698
Food Service & Refrigeration Measures			**205**	**0.0**	**0**	**$42**	**$303**	**$40**	**$263**	**6.3**	**206**
ECM 9	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	205	0.0	0	$42	$303	$40	$263	6.3	206
Custom Measures			**2,030**	**0.0**	**0**	**$415**	**$10,251**	**$0**	**$10,251**	**24.7**	**2,044**
ECM 10	Replace Electric Water Heater with Heat Pump Water Heater	No	2,030	0.0	0	$415	$10,251	$0	$10,251	24.7	2,044
TOTALS			**21,551**	**5.1**	**16**	**$4,756**	**$31,789**	**$2,718**	**$29,071**	**6.1**	**24,332**

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

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

Figure 6 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**16,574**	**4.2**	**-5**	**$3,280**	**$8,758**	**$1,446**	**$7,312**	**2.2**	**15,930**
ECM 1	Install LED Fixtures	5,676	0.0	0	$1,159	$3,152	$600	$2,552	2.2	5,716
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	7,742	3.1	-3	$1,507	$4,475	$670	$3,805	2.5	7,257
ECM 3	Retrofit Fixtures with LED Lamps	3,155	1.2	-1	$614	$1,131	$176	$955	1.6	2,957
Lighting Control Measures		**1,759**	**0.6**	**-1**	**$343**	**$2,700**	**$350**	**$2,350**	**6.9**	**1,649**
ECM 4	Install Occupancy Sensor Lighting Controls	1,759	0.6	-1	$343	$2,700	$350	$2,350	6.9	1,649
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**21**	**$476**	**$5,486**	**$500**	**$4,986**	**10.5**	**3,512**
ECM 7	Install High Efficiency Furnaces	0	0.0	21	$476	$5,486	$500	$4,986	10.5	3,512
Domestic Water Heating Upgrade		**693**	**0.0**	**0**	**$141**	**$2,019**	**$382**	**$1,637**	**11.6**	**698**
ECM 8	Install Low-Flow DHW Devices	693	0.0	0	$141	$2,019	$382	$1,637	11.6	698
Food Service & Refrigeration Measures		**205**	**0.0**	**0**	**$42**	**$303**	**$40**	**$263**	**6.3**	**206**
ECM 9	Refrigerator/Freezer Case Electrically Commutated Motors	205	0.0	0	$42	$303	$40	$263	6.3	206
TOTALS		**19,231**	**4.9**	**16**	**$4,282**	**$19,265**	**$2,718**	**$16,548**	**3.9**	**21,996**

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

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

Figure 7 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**16,574**	**4.2**	**-5**	**$3,280**	**$8,758**	**$1,446**	**$7,312**	**2.2**	**15,930**
ECM 1	Install LED Fixtures	5,676	0.0	0	$1,159	$3,152	$600	$2,552	2.2	5,716
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	7,742	3.1	-3	$1,507	$4,475	$670	$3,805	2.5	7,257
ECM 3	Retrofit Fixtures with LED Lamps	3,155	1.2	-1	$614	$1,131	$176	$955	1.6	2,957

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

ECM 1: Install LED Fixtures

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

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

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

Affected Building Areas:

Bathhouse Shower: exterior wall packs

Family Campsite Shower: exterior socketed fixtures

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

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

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

Affected Building Areas:

Bathhouse Shower: lifeguard storage room, restrooms, snack shack, snack shack storage, and the storage room.

ECM 3: Retrofit Fixtures with LED Lamps

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

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

Affected Building Areas:

Bathhouse Shower: lifeguard room, lifeguard DHW room, lifeguard restroom 1, lifeguard restroom 2, lifeguard shower, men's restroom DHW room 1, men's restroom DHW room 2, snack shack, and snack shack restroom

Family Campsite Shower: mechanical room, men's restroom, and women's restroom

Bathhouse Pumphouse: pumphouse

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**1,759**	**0.6**	**-1**	**$343**	**$2,700**	**$350**	**$2,350**	**6.9**	**1,649**
ECM 4	Install Occupancy Sensor Lighting Controls	1,759	0.6	-1	$343	$2,700	$350	$2,350	6.9	1,649

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

ECM 4: Install Occupancy Sensor Lighting Controls

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

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

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

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

Affected Building Areas:

Bathhouse Shower: lifeguard room, men's restroom, snack shack, snack shack storage room, and women's restroom

Family Campsite Shower: men's restroom and women's restroom

4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**128**	**0.0**	**0**	**$26**	**$1,330**	**$0**	**$1,330**	**50.9**	**129**
ECM 5	Premium Efficiency Motors	128	0.0	0	$26	$1,330	$0	$1,330	50.9	129

ECM 5: Premium Efficiency Motors

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

Affected Motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Mechanical Room - Family Campsite Shower	Furnace Exhaust Fan	1	Exhaust Fan	0.3	Exhaust Fan
Mechanical Room - Family Campsite Shower	Combustion Air Fan	1	Combustion Air Fan	0.3	Combustion Air Fan

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

4.4 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**162**	**0.1**	**0**	**$33**	**$942**	**$0**	**$942**	**28.6**	**163**
ECM 6	Install High Efficiency Air Conditioning Units	162	0.1	0	$33	$942	$0	$942	28.6	163

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

ECM 6: Install High Efficiency Air Conditioning Units

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

Affected Units:

The Bathhouse Shower: lifeguard room

4.5 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**21**	**$476**	**$5,486**	**$500**	**$4,986**	**10.5**	**3,512**
ECM 7	Install High Efficiency Furnaces	0	0.0	21	$476	$5,486	$500	$4,986	10.5	3,512

ECM 7: Install High Efficiency Furnaces

Replace standard efficiency furnaces with condensing furnaces. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases, which can significantly improve furnace efficiency. Savings result from improved system efficiency.

Note: these units produce acidic condensate that require proper drainage.

Affected Units:

Family Campsite Shower: forced air furnace

4.6 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**693**	**0.0**	**0**	**$141**	**$2,019**	**$382**	**$1,637**	**11.6**	**698**
ECM 8	Install Low-Flow DHW Devices	693	0.0	0	$141	$2,019	$382	$1,637	11.6	698

ECM 8: Install Low-Flow DHW Devices

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

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

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

4.7 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**205**	**0.0**	**0**	**$42**	**$303**	**$40**	**$263**	**6.3**	**206**
ECM 9	Refrigerator/Freezer Case Electrically Commutated Motors	205	0.0	0	$42	$303	$40	$263	6.3	206

ECM 9: Refrigerator/Freezer Case Electrically Commutated Motors

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

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

4.8 Custom Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Custom Measures		**2,030**	**0.0**	**0**	**$415**	**$10,251**	**$0**	**$10,251**	**24.7**	**2,044**
ECM 10	Replace Electric Water Heater with Heat Pump Water Heater	2,030	0.0	0	$415	$10,251	$0	$10,251	24.7	2,044

CM 10: Replace Electric Water Heater with Heat Pump Water Heater

A typical electric water heater uses electric resistance coils to heat water at a coefficient of performance (COP) of 1. Air source heat pump water heaters (HPWH) use a refrigeration cycle to transfer heat from the surrounding air to the domestic water. The typical average COP for a HPWH is about 2.5, so they require significantly less electricity to produce the same amount of hot water as a traditional electric water heater. There are two types of HPWH, those integrated with the heat pump and storage tank in the same unit, and those that are split into two sections (with the storage tank separate from the heat pump). The following addresses integrated HPWH.

HPWH reject cold air. As such, they need to be installed in an unconditioned space of about 750 cubic feet with good ventilation. Ideal locations are garages, large enclosed, unconditioned storage areas, or areas with excess heat such as a furnace or boiler room.[4] The HPWH will also produce condensate so accommodations for draining the condensate need to be provided.

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

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

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

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

Weatherization

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

Lighting Maintenance

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

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

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

Motor Maintenance

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

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.

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

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

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

use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

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

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

Procurement Strategies

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

6 On-site Generation

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

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

6.1 Solar Photovoltaic

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

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

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

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

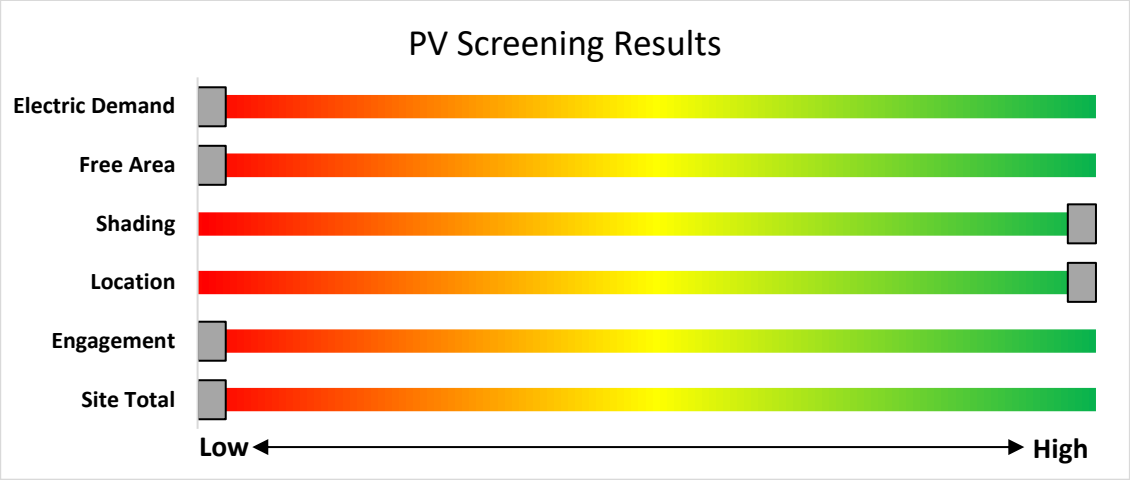


Figure 8 - Photovoltaic Screening

Successor Solar Incentive Program (SuSI)

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

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

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

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

6.2 Combined Heat and Power

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

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

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

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

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

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

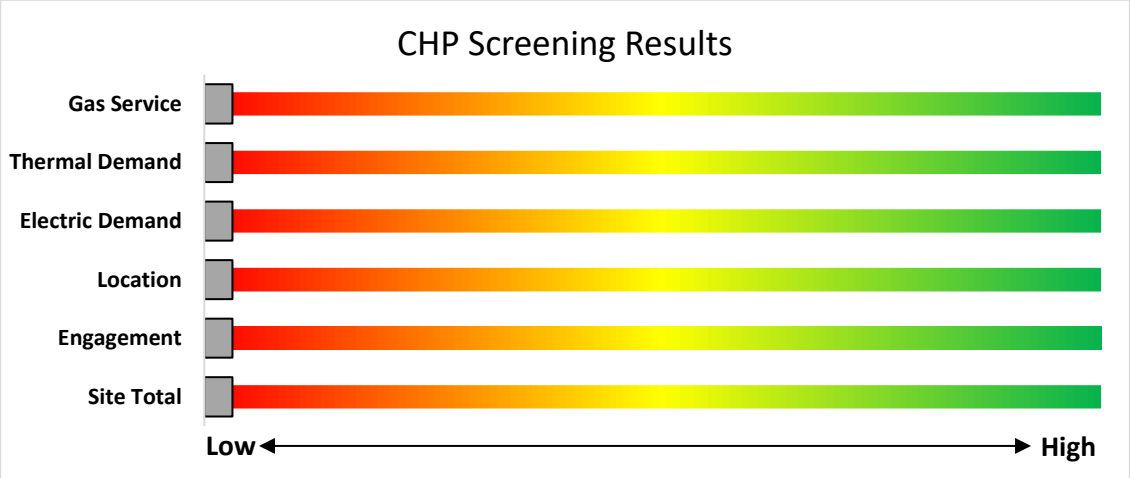


Figure 9 - Combined Heat and Power Screening

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

7 ELECTRIC VEHICLES (EV)

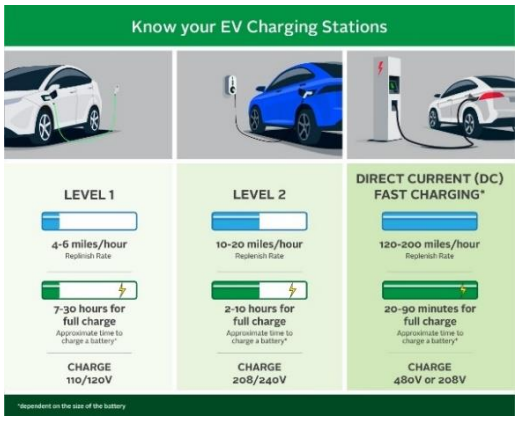
All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes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

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

7.1 Electric Vehicle Charging

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

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



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

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

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

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

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

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

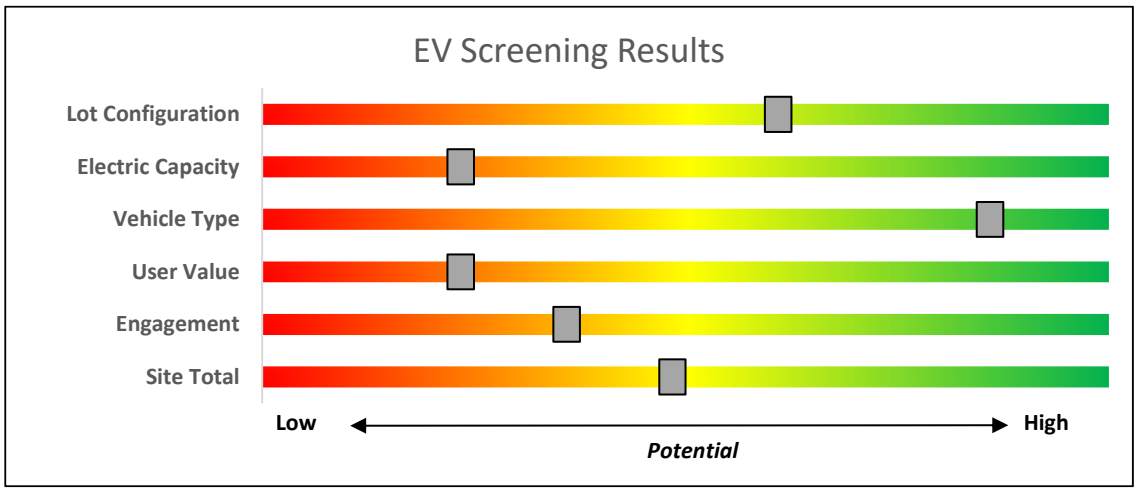


Figure 10 – EV Charger Screening

Electric Vehicle Programs Available

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

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

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

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

8 PROJECT FUNDING AND INCENTIVES

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

8.1 Utility Energy Efficiency Programs

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

Prescriptive and Custom

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

Equipment Examples

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

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

Direct Install

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

Incentives

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

How to Participate

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

Engineered Solutions

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

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

8.2 New Jersey's Clean Energy Programs

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

Large Energy Users

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

Incentives

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

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

How to Participate

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

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

Combined Heat and Power

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

Incentives

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

Successor Solar Incentive Program (SuSI)

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

Administratively Determined Incentive (ADI) Program

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

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

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

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

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

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

Competitive Solar Incentive Program

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

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

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

Energy Savings Improvement Program

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

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

How to Participate

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

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

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

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

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

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

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

9 PROJECT DEVELOPMENT

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

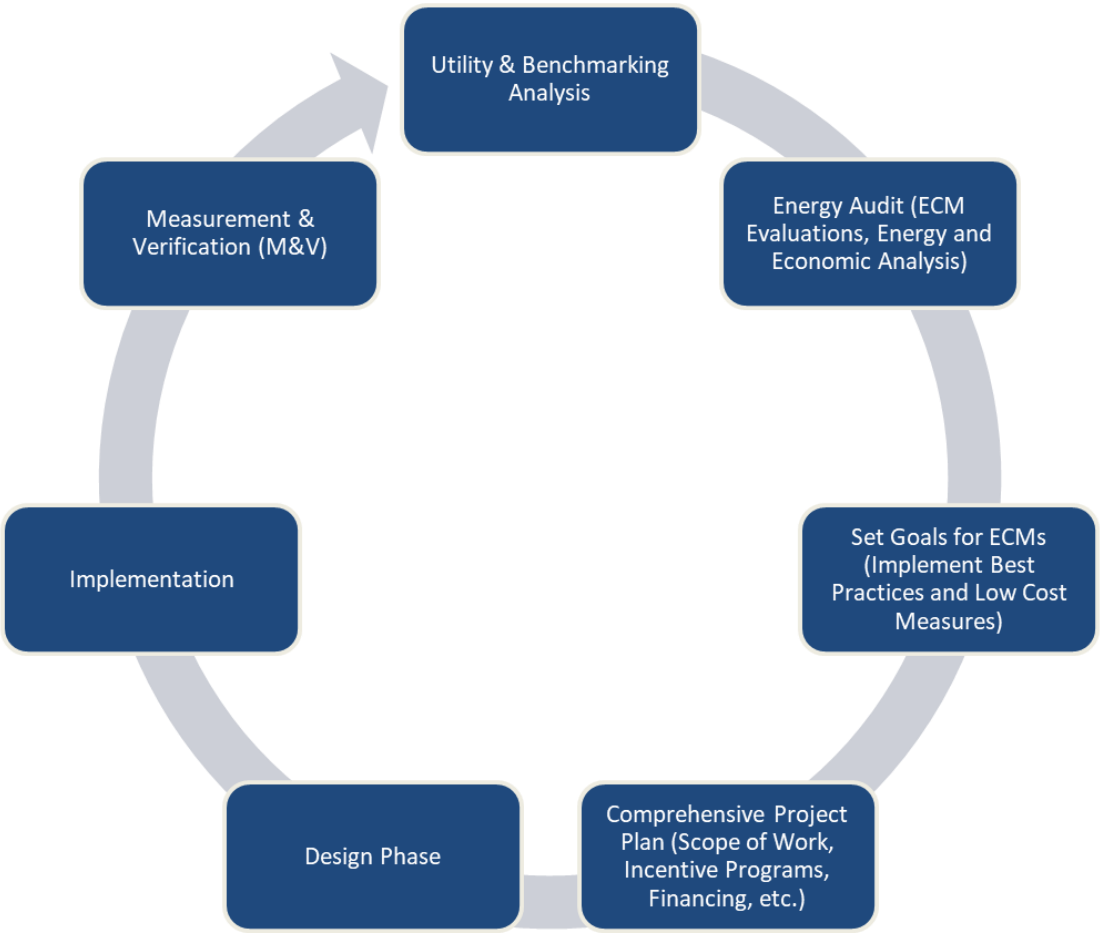


Figure 11 – Project Development Cycle

10 Energy Purchasing and Procurement Strategies

10.1 Retail Electric Supply Options

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

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

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

10.2 Retail Natural Gas Supply Options

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

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

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

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

[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
Exterior Wall Pack - Bathhouse Shower	10	High-Pressure Sodium: (1) 100W Lamp	Timeclock		138	4,380	1	Fixture Replacement	No	10	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	30	4,380	0.0	4,730	0	$966	$2,626	$500	2.2
Life Guard Room - Bathhouse Shower	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Life Guard Room - Bathhouse Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	2,200	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	2,200	0.0	86	0	$17	$17	$1	1.0
Life Guard Room - Bathhouse Shower	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,200	3, 4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,518	0.2	527	0	$103	$489	$95	3.8
Lifeguard DHW Room - Bathhouse Shower	1	Compact Fluorescent: (1) 26W A19 Screw-In Lamp	Wall Switch	S	26	1,000	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	19	1,000	0.0	8	0	$1	$17	$1	11.0
Lifeguard DHW Room - Bathhouse Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	1,000	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	1,000	0.0	39	0	$8	$17	$1	2.1
Lifeguard Restroom 1 - Bathhouse Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	2,200	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	2,200	0.0	86	0	$17	$17	$1	1.0
Lifeguard Restroom 2 - Bathhouse Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	2,200	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	2,200	0.0	86	0	$17	$17	$1	1.0
Lifeguard Shower - Bathhouse Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	2,200	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	2,200	0.0	86	0	$17	$17	$1	1.0
Lifeguard Storage Room - Bathhouse Shower	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Lifeguard Storage Room - Bathhouse Shower	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	1,000	2	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	1,000	0.2	186	0	$36	$257	$40	6.0
Men's Restroom - Bathhouse Shower	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Men's Restroom - Bathhouse Shower	13	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	2,200	2, 4	Relamp & Reballast	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,518	0.8	2,100	-1	$409	$1,164	$165	2.4
Men's Restroom - Bathhouse Shower	7	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	2,200	2, 4	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,518	0.7	1,802	-1	$351	$1,171	$175	2.8
Men's Restroom DHW Room 1 - Bathhouse Shower	1	Compact Fluorescent: (1) 26W A19 Screw-In Lamp	Wall Switch	S	26	1,000	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	19	1,000	0.0	8	0	$1	$17	$1	11.0
Men's Restroom DHW Room 1 - Bathhouse Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	1,000	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	1,000	0.0	39	0	$8	$17	$1	2.1
Men's Restroom DHW Room 2 - Bathhouse Shower	1	Compact Fluorescent: (1) 26W A19 Screw-In Lamp	Wall Switch	S	26	1,000	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	19	1,000	0.0	8	0	$1	$17	$1	11.0
Men's Restroom DHW Room 2 - Bathhouse Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	1,000	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	1,000	0.0	39	0	$8	$17	$1	2.1
Snack Shack - Bathhouse Shower	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Snack Shack - Bathhouse Shower	7	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	2,200	2, 4	Relamp & Reballast	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,518	0.4	1,131	0	$220	$751	$105	2.9
Snack Shack - Bathhouse Shower	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,200	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,200	0.1	314	0	$61	$146	$40	1.7
Snack Shack Restroom - Bathhouse Shower	1	Compact Fluorescent: (1) 26W A19 Screw-In Lamp	Wall Switch	S	26	1,500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	19	1,500	0.0	11	0	$2	$17	$1	7.3
Snack Shack Storage - Bathhouse Shower	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	1,500	2, 4	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,035	0.2	330	0	$64	$476	$65	6.4
Storage Room - Bathhouse Shower	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	1,000	2	Relamp & Reballast	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.1	127	0	$25	$138	$20	4.7
Women's Restroom - Bathhouse Shower	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	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
Women's Restroom - Bathhouse Shower	12	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	2,200	2, 4	Relamp & Reballast	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,518	0.7	1,939	-1	$377	$1,095	$155	2.5
Women's Restroom - Bathhouse Shower	6	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	S	158	2,200	2, 4	Relamp & Reballast	Yes	6	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,518	0.6	1,544	-1	$301	$1,042	$155	3.0
Exterior Socket - Family Campsite Shower	2	High-Pressure Sodium: (1) 100W Lamp	Timeclock		138	4,380	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	30	4,380	0.0	946	0	$193	$525	$100	2.2
Mechanical Room - Family Campsite Shower	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Mechanical Room - Family Campsite Shower	3	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	1,500	3	Relamp	No	3	LED Lamps: A19 Lamps	Wall Switch	7	1,500	0.1	175	0	$34	$52	$3	1.4
Mechanical Room - Family Campsite Shower	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	1,500	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,500	0.1	181	0	$35	$146	$40	3.0
Men's Restroom - Family Campsite Shower	8	Compact Fluorescent: (1) 26W A19 Screw-In Lamp	Wall Switch	S	26	2,800	3, 4	Relamp	Yes	8	LED Lamps: A19 Lamps	Occupancy Sensor	19	1,932	0.1	312	0	$61	$408	$43	6.0
Men's Restroom - Family Campsite Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	2,800	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	2,800	0.0	109	0	$21	$17	$1	0.8
Men's Restroom - Family Campsite Shower	3	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	2,800	3, 4	Relamp	Yes	3	LED Lamps: A19 Lamps	Occupancy Sensor	7	1,932	0.1	346	0	$67	$322	$38	4.2
Women's Restroom - Family Campsite Shower	8	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	2,800	3, 4	Relamp	Yes	8	LED Lamps: A19 Lamps	Occupancy Sensor	7	1,932	0.3	923	0	$180	$408	$43	2.0
Women's Restroom - Family Campsite Shower	1	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch	S	43	2,800	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	7	2,800	0.0	109	0	$21	$17	$1	0.8
Women's Restroom - Family Campsite Shower	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Pumphouse	1	Compact Fluorescent: 1L - A19-26W	Wall Switch	S	26	1,000	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	18	1,000	0.0	8	0	$2	$17	$1	9.9
Chlorination Pumphouse	1	Compact Fluorescent: 1L - A19-26W	Wall Switch	S	26	0		None	No	1	Compact Fluorescent: 1L - A19-26W	Wall Switch	26	0	0.0	0	0	$0	$0	$0	0.0
Chlorination Pumphouse	1	Incandescent: Inc-A19-43W-1L-S/L-SPL-ES	Wall Switch	S	43	0		None	No	1	Incandescent: Inc-A19-43W-1L-S/L-SPL-ES	Wall Switch	43	0	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
Mechanical Room - Family Campsite Shower	Furnace Exhaust Fan	1	Exhaust Fan	0.3	60.0%	No	Marathon Electric	2WK48S17T2001F	B	2,745	5	Yes	69.5%	No		0.0	87	0	$18	$448	$0	25.1
Mechanical Room - Family Campsite Shower	Combustion Air Fan	1	Combustion Air Fan	0.3	62.5%	No	Marathon Electric	3PB48S34S369D	B	1,800	5	Yes	69.5%	No		0.0	41	0	$8	$882	$0	106.5

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
Life Guard Room - Family Campsite Shower	Electric Resistance Heat	1	Electric Resistance Heat		17.32		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
Mechanical Room - Family Campsite Shower	Forced Hot Air Furnace	1	Forced Air Furnace		200.00		0.8 Et	Jackson and Church - Flexaire	SDF_20-OFU	B	7	Yes	1	Forced Air Furnace		200.00		0.97 AFUE	0.0	0	21	$476	$5,486	$500	10.5
Life Guard Room - Bathhouse Shower	Window AC Unit	1	Window AC	1.00		9.80		Unknown	Unknown	B	6	Yes	1	Window AC	1.00		12.00		0.1	162	0	$33	$942	$0	28.6

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Manufacturer	Model	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room - Family Campsite Shower	DHW Tank	1	Storage Tank Water Heater (> 50 Gal)	Bradford White	LE2120ET3	W		No						0.0	0	0	$0	$0	$0	0.0
Lifeguard DHW Room - Bathhouse Shower	DHW Tank	1	Storage Tank Water Heater (> 50 Gal)	AO Smith	DSE 65A	W		No						0.0	0	0	$0	$0	$0	0.0
Men's Restroom DHW Room 1 - Bathhouse Shower	DHW Tank	1	Storage Tank Water Heater (> 50 Gal)	AO Smith	DSE 65A	W		No						0.0	0	0	$0	$0	$0	0.0
Men's Restroom DHW Room 2 - Bathhouse Shower	DHW Tank	1	Storage Tank Water Heater (≤ 50 Gal)	AO Smith	EJC-6 200	W		No						0.0	0	0	$0	$0	$0	0.0
Snack Shack - Bathhouse Shower	DHW Tank	1	Storage Tank Water Heater (≤ 50 Gal)	AO Smith	EJC-6 200	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)**	*Fuel Type*	**Total Peak kW Savings**	**Total Annual kWh Savings**	**Total Annual MMBtu Savings**	**Total Annual Energy Cost Savings**	**Estimated M&L Cost ($)**	**Total Incentives**	*Total Net Cost*	*Payback w/o Incentives in Years*	**Simple Payback w/ Incentives in Years**
Snack Shack - Bathhouse Shower	8	1	Faucet Aerator (Kitchen)	1.80	1.50	Electric	0.0	7	0	$2	$7	$2	$5.17	4.77	3.4
Lifeguard Restroom 1 - Bathhouse Shower	8	1	Faucet Aerator (Lavatory)	1.80	0.50	Electric	0.0	32	0	$7	$7	$4	$3.59	1.10	0.6
Lifeguard Restroom 2 - Bathhouse Shower	8	1	Faucet Aerator (Lavatory)	1.80	0.50	Electric	0.0	32	0	$7	$7	$4	$3.59	1.10	0.6
Men's Restroom - Bathhouse Shower	8	4	Faucet Aerator (Lavatory)	1.80	0.50	Electric	0.0	128	0	$26	$29	$14	$14.34	1.10	0.6
Snack Shack Restroom - Bathhouse Shower	8	1	Faucet Aerator (Lavatory)	1.80	0.50	Electric	0.0	32	0	$7	$7	$4	$3.59	1.10	0.6
Women's Restroom - Bathhouse Shower	8	4	Faucet Aerator (Lavatory)	1.80	0.50	Electric	0.0	128	0	$26	$29	$14	$14.34	1.10	0.6
Lifeguard Shower - Bathhouse Shower	8	1	Showerhead	1.50	1.50	Electric	0.0	0	0	$0	$89	$15	$74.30	0.00	0.0
Men's Restroom - Bathhouse Shower	8	7	Showerhead	1.50	1.50	Electric	0.0	0	0	$0	$625	$105	$520.10	0.00	0.0
Women's Restroom - Bathhouse Shower	8	7	Showerhead	1.50	1.50	Electric	0.0	0	0	$0	$625	$105	$520.10	0.00	0.0
Men's Restroom DHW Room 1 - Bathhouse Shower	8	1	Faucet Aerator (Kitchen)	2.00	1.50	Electric	0.0	12	0	$3	$7	$2	$5.17	2.86	2.1
Men's Restroom - Family Campsite Shower	8	3	Faucet Aerator (Lavatory)	1.80	0.50	Electric	0.0	96	0	$20	$22	$11	$10.76	1.10	0.6
Women's Restroom - Family Campsite Shower	8	3	Faucet Aerator (Lavatory)	1.80	0.50	Electric	0.0	96	0	$20	$22	$11	$10.76	1.10	0.6
Men's Restroom - Family Campsite Shower	8	3	Showerhead	1.80	1.50	Electric	0.0	62	0	$13	$268	$45	$222.90	21.17	17.6
Women's Restroom - Family Campsite Shower	8	3	Showerhead	1.80	1.50	Electric	0.0	62	0	$13	$268	$45	$222.90	21.17	17.6
Mechanical Room - Family Campsite Shower	8	1	Faucet Aerator (Kitchen)	1.80	1.50	Electric	0.0	7	0	$2	$7	$2	$5.17	4.77	3.4

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Manufacturer	Model	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Snack Shack - Bathhouse Shower	1	Medium Temp Freezer (0F to 30F)	Kolpak		9	Yes	No	No	0.0	205	0	$42	$303	$40	6.3

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	Manufacturer	Model	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Snack Shack - Bathhouse Shower	1	Stand-Up Refrigerator, Glass Door (31 - 50 cu. ft.)	TRUE	GDM-43-HC-TSL01	No		No	0.0	0	0	$0	$0	$0	0.0
Snack Shack - Bathhouse Shower	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	TRUE	T-19	No		No	0.0	0	0	$0	$0	$0	0.0
Snack Shack - Bathhouse Shower	1	Refrigerator Chest	Vestfrost	SCF1310	No		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	Manufacturer	Model	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Snack Shack - Bathhouse Shower	1	Self-Contained Unit (<175 lbs/day), Batch	Manitowoc	QD0453	No		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	Manufacturer	Model	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Snack Shack - Bathhouse Shower	1	Electric Griddle (4 Feet Width)	Vulcan	HEC36D	Yes		No	0.0	0	0	$0	$0	$0	0.0
Snack Shack - Bathhouse Shower	2	Electric Fryer	Ablo and Ceceilware	Unknown	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
Men's Restroom - Bathhouse Shower	3	Fan (Ceiling)	60			
Women's Restroom - Bathhouse Shower	3	Fan (Ceiling)	60			
Lifeguard Storage Room - Bathhouse Shower	1	Microwave	900			
Snack Shack - Bathhouse Shower	1	Microwave	900			
Life Guard Room - Bathhouse Shower	1	Refrigerator (Residential)	350			

Custom (High Level) Measure Analysis

Electric Tank Water Heater to HPWH

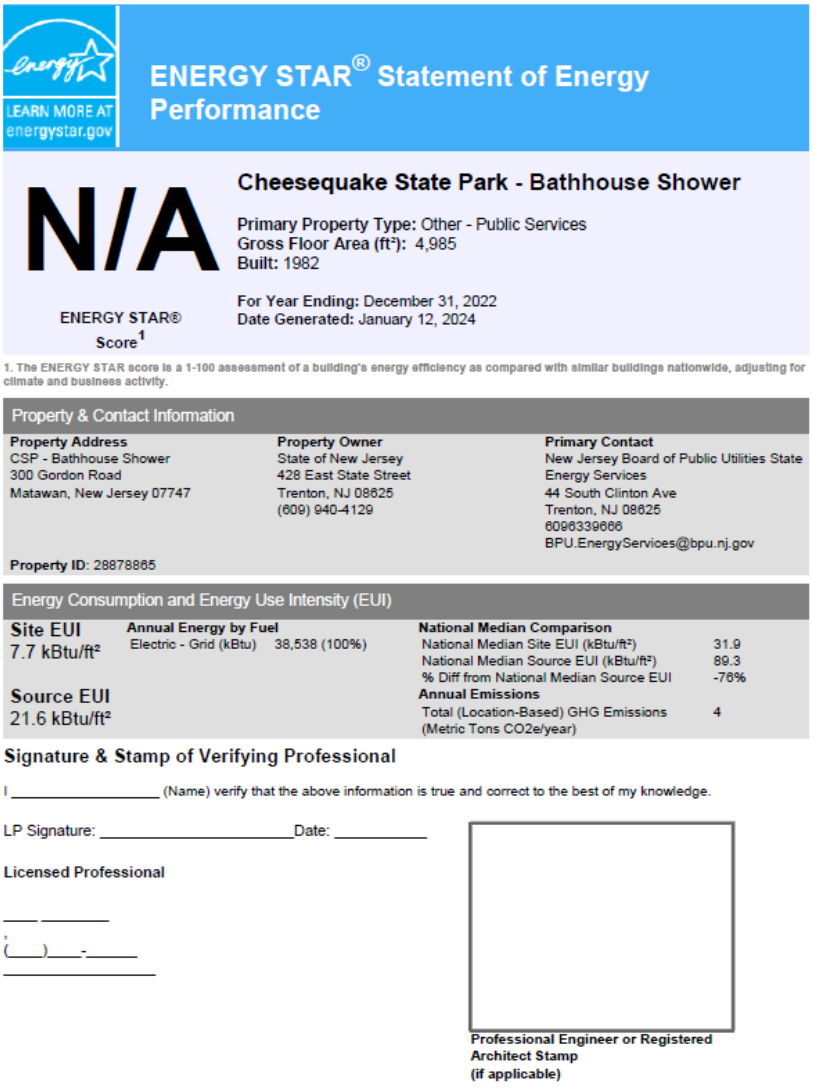
NOTE: HPWH calculation should not be used for existing water heaters with a storage capacity greater than 120 gal.

Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis										
Description	Area(s)/System(s) Served	SF of Area Served	Fuel Type	Input Capacity per Unit (kW)	Tank Capacity per Unit (Gal)	Description	COP	Tank Capacity per Unit (Gal)	Estimated Unit Cost	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Payback w/ Incentives in Years
Storage Tank Water Heater (>50 Gal)	Mechanical Room - Family	700	Electric	4.5	119	Heat Pump Water Heater	2.5	119	$4,544.73	0.00	258	0	$53	$4,545	$0	$0	$0	$4,545	85.75	85.75
Storage Tank Water Heater (>50 Gal)	Lifeguard DHW Room - Bathhouse Shower	2,400	Electric	12.0	65	Heat Pump Water Heater	2.5	65	$2,853.07	0.00	886	0	$181	$2,853	$0	$0	$0	$2,853	15.76	15.76
Storage Tank Water Heater (>50 Gal)	Men's Restroom DHW Room - Bathhouse Shower	2,400	Electric	12.0	65	Heat Pump Water Heater	2.5	65	$2,853.07	0.00	886	0	$181	$2,853	$0	$0	$0	$2,853	15.76	15.76

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.

NJCEP uses the EPA's ENERGY STAR Portfolio Manager system to generate baseline energy usage results and comparable building EUIs. Portfolio Manager is specifically designed for benchmarking energy consumption within a building. NJCEP is unable to provide an ENERGY STAR Statement of Energy Performance (SEP) for these facilities due to their building type. Site utility bills have been entered into Portfolio Manager. We encourage you to keep the utility bills updated monthly within Portfolio Manager for energy and cost savings purposes.



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ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

Cheesequake State Park - Bathhouse Shower

Primary Property Type: Other - Public Services
Gross Floor Area (ft²): 4,985
Built: 1982

For Year Ending: December 31, 2022
Date Generated: January 12, 2024

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
CSP - Bathhouse Shower 300 Gordon Road Matawan, New Jersey 07747	State of New Jersey 428 East State Street Trenton, NJ 08625 (609) 940-4129	New Jersey Board of Public Utilities State Energy Services 44 South Clinton Ave Trenton, NJ 08625 6096339666 BPU.EnergyServices@bpu.nj.gov

Property ID: 28878865

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
7.7 kBtu/ft²

Source EUI
21.6 kBtu/ft²

Annual Energy by Fuel		
Electric - Grid (kBtu)	38,538 (100%)	

National Median Comparison	
National Median Site EUI (kBtu/ft²)	31.9
National Median Source EUI (kBtu/ft²)	89.3
% Diff from National Median Source EUI	-76%
Annual Emissions	
Total (Location-Based) GHG Emissions (Metric Tons CO2e/year)	4

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)

ENERGY STAR® Statement of Energy Performance

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Cheesequake State Park - Family Campsite Shower

N/A

ENERGY STAR® Score[1]

Primary Property Type: Other - Public Services
Gross Floor Area (ft²): 1,460
Built: 1972

For Year Ending: December 31, 2022
Date Generated: January 12, 2024

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
CSP - Family Campsite Shower
300 Gordon Road
Matawan, New Jersey 07747

Property Owner
State of New Jersey
428 East State Street
Trenton, NJ 08625
(609) 940-4129

Primary Contact
New Jersey Board of Public Utilities State Energy Services
44 South Clinton Ave
Trenton, NJ 08625
6096339666
BPU.EnergyServices@bpu.nj.gov

Property ID: 28878866

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
103.3 kBtu/ft²

Source EUI
255.2 kBtu/ft²

Annual Energy by Fuel

Fuel Oil (No. 2) (kBtu)	27,641 (18%)
Electric - Grid (kBtu)	123,105 (82%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	36.1
National Median Source EUI (kBtu/ft²)	89.3
% Diff from National Median Source EUI	186%

Annual Emissions

Total (Location-Based) GHG Emissions (Metric Tons CO2e/year)	13

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)

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

Cheesequake State Park - Pump House

N/A

ENERGY STAR® Score[1]

Primary Property Type: Other - Public Services
Gross Floor Area (ft²): 150
Built: 1958

For Year Ending: December 31, 2022
Date Generated: January 11, 2024

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
CSP - Bathhouse Pump House
300 Gordon Road
Matawan, New Jersey 07747

Property Owner
State of New Jersey
428 East State Street
Trenton, NJ 08625
(609) 940-4129

Primary Contact
New Jersey Board of Public Utilities State Energy Services
44 South Clinton Ave
Trenton, NJ 08625
6096339666
BPU.EnergyServices@bpu.nj.gov

Property ID: 28878868

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
237.4 kBtu/ft²

Source EUI
664.7 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	35,610	(100%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	31.9
National Median Source EUI (kBtu/ft²)	89.3
% Diff from National Median Source EUI	645%

Annual Emissions

Total (Location-Based) GHG Emissions (Metric Tons CO2e/year)	3

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, which is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp.
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp.
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money, and the environment.
psig	Pounds per square inch gauge
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

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