



# Local Government Energy Audit Report

Recreation Building

November 19, 2020

*Prepared for:*

Toms River Township  
1810 Warren Point Road  
Toms River, NJ 08754

*Prepared by:*

TRC  
900 Route 9 North  
Woodbridge, NJ 07095

# Disclaimer

---

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

TRC 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 installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. Cost estimates include material and labor pricing associated with installation of primary recommended equipment only. Cost estimates do not include demolition or removal of hazardous waste. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

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

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

Copyright ©2020 TRC. All rights reserved.

Reproduction or distribution of the whole, or any part of the contents of this document without written permission of TRC is prohibited. Neither TRC nor any of its employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any data, information, method, product or process disclosed in this document, or represents that its use will not infringe upon any privately-owned rights, including but not limited to, patents, trademarks or copyrights.

# Table of Contents

---

<b>1</b>	<b>Executive Summary</b> .....	<b>1</b>
1.1	<b>Planning Your Project</b> .....	4
	Pick Your Installation Approach .....	4
	More Options from Around the State.....	6
<b>2</b>	<b>Existing Conditions</b> .....	<b>7</b>
2.1	Site Overview.....	7
2.2	Building Occupancy .....	7
2.3	Building Envelope .....	8
2.4	Lighting Systems.....	8
2.5	Air Handling Systems .....	9
	Heating .....	9
	Air Conditioners .....	9
2.6	Domestic Hot Water.....	9
2.7	Plug Load & Vending Machines.....	10
2.8	Water-Using Systems .....	10
2.9	Process Equipment.....	10
<b>3</b>	<b>Energy Use and Costs</b> .....	<b>11</b>
3.1	Electricity .....	13
3.2	Benchmarking.....	14
	Tracking Your Energy Performance.....	15
<b>4</b>	<b>Energy Conservation Measures</b> .....	<b>16</b>
4.1	Lighting .....	18
	ECM 1: Retrofit Fluorescent Fixtures with LED Lamps and Drivers.....	18
	ECM 2: Retrofit Fixtures with LED Lamps.....	18
4.2	Lighting Controls.....	19
	ECM 3: Install Occupancy Sensor Lighting Controls .....	19
4.3	Measures for Future Consideration .....	20
	Pool System Upgrades.....	20
	Upgrade to a Heat Pump System .....	21
<b>5</b>	<b>Energy Efficient Best Practices</b> .....	<b>22</b>
	Energy Tracking with ENERGY STAR® Portfolio Manager®.....	22
	Weatherization.....	22
	Doors and Windows .....	22
	Motor Maintenance .....	23
	Thermostat Schedules and Temperature Resets .....	23
	AC System Evaporator/Condenser Coil Cleaning .....	23
	Water Heater Maintenance .....	23
	Plug Load Controls.....	24
	Water Conservation .....	24



Procurement Strategies ..... 24

**6 On-site Generation .....25**

6.1 Solar Photovoltaic ..... 26

6.2 Combined Heat and Power ..... 27

**7 Project Funding and Incentives.....28**

7.1 SmartStart ..... 29

7.2 Direct Install ..... 30

7.3 Pay for Performance - Existing Buildings..... 31

7.4 Combined Heat and Power ..... 32

7.5 Energy Savings Improvement Program ..... 33

7.6 Transition Incentive (TI) Program..... 34

**8 Energy Purchasing and Procurement Strategies .....35**

8.1 Retail Electric Supply Options..... 35

8.2 Retail Natural Gas Supply Options ..... 35

**Appendix A: Equipment Inventory & Recommendations ..... A-1**

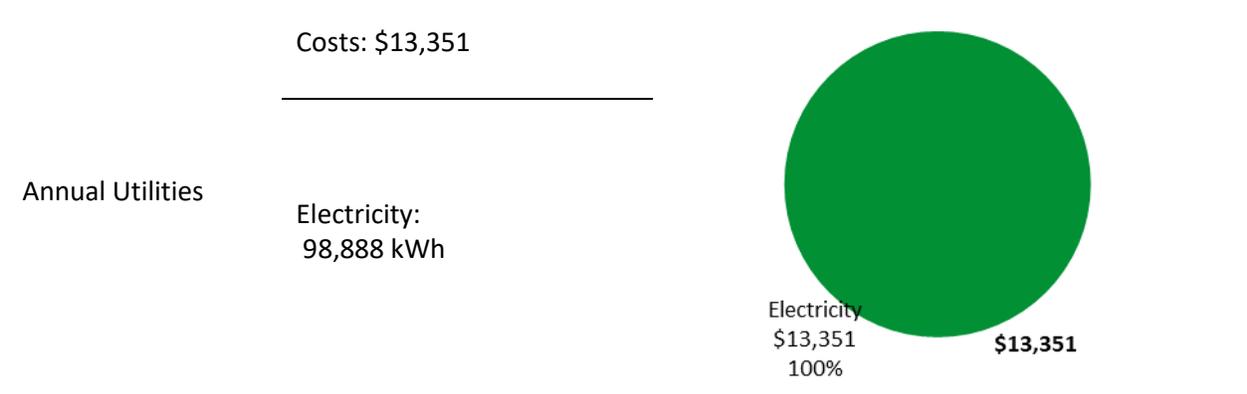
**Appendix B: ENERGY STAR® Statement of Energy Performance..... B-1**

**Appendix C: Glossary .....C-1**

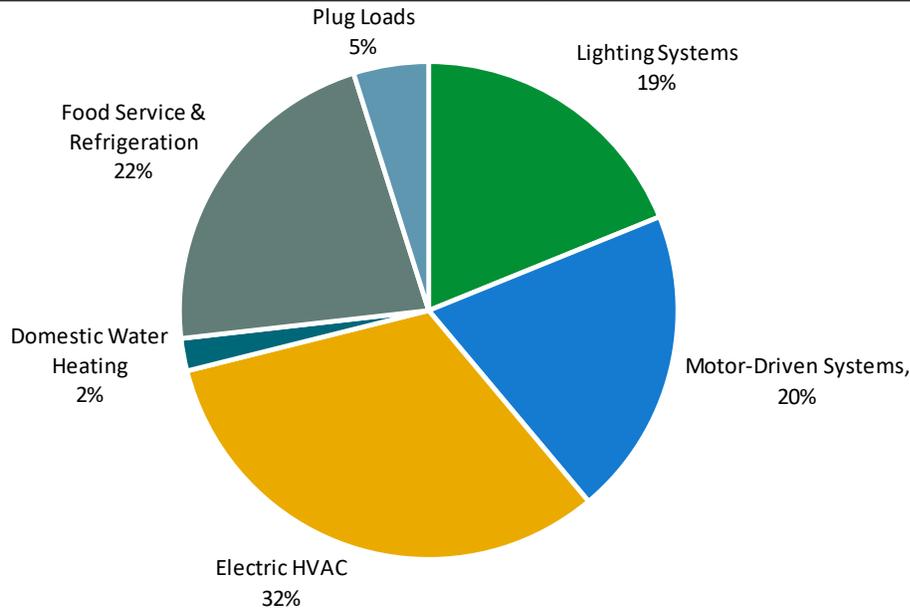
# 1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBP) has sponsored this Local Government Energy Audit (LGEA) report for Recreation Building. 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



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**

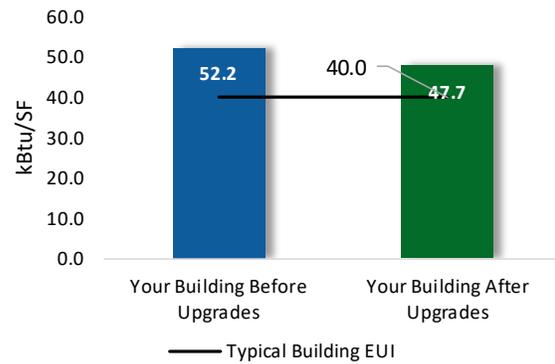
## POTENTIAL IMPROVEMENTS



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.

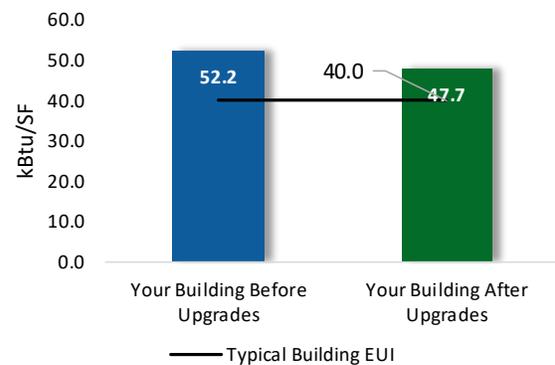
### Scenario 1: Full Package (all evaluated measures)

Installation Cost	\$8,096
Potential Rebates & Incentives <sup>1</sup>	\$2,990
Annual Cost Savings	\$1,148
Annual Energy Savings	Electricity: 8,503 kWh
Greenhouse Gas Emission Savings	4 Tons
Simple Payback	4.4 Years
Site Energy Savings (all utilities)	9%



### Scenario 2: Cost Effective Package<sup>2</sup>

Installation Cost	\$8,096
Potential Rebates & Incentives	\$2,990
Annual Cost Savings	\$1,148
Annual Energy Savings	Electricity: 8,503 kWh
Greenhouse Gas Emission Savings	4 Tons
Simple Payback	4.4 Years
Site Energy Savings (all utilities)	9%



### On-site Generation Potential

Photovoltaic	None
Combined Heat and Power	None

<sup>1</sup> Incentives are based on current SmartStart Prescriptive incentives. Other Program incentives may apply.

<sup>2</sup> 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 Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>			<b>6,641</b>	<b>2.4</b>	<b>0</b>	<b>\$897</b>	<b>\$4,354</b>	<b>\$2,210</b>	<b>\$2,144</b>	<b>2.4</b>	<b>6,687</b>
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	370	0.2	0	\$50	\$344	\$100	\$244	4.9	373
ECM 2	Retrofit Fixtures with LED Lamps	Yes	6,271	2.2	0	\$847	\$4,010	\$2,110	\$1,900	2.2	6,315
<b>Lighting Control Measures</b>			<b>1,862</b>	<b>0.6</b>	<b>0</b>	<b>\$251</b>	<b>\$3,742</b>	<b>\$780</b>	<b>\$2,962</b>	<b>11.8</b>	<b>1,875</b>
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	1,862	0.6	0	\$251	\$3,742	\$780	\$2,962	11.8	1,875
<b>TOTALS (COST EFFECTIVE MEASURES)</b>			<b>8,503</b>	<b>3.0</b>	<b>0</b>	<b>\$1,148</b>	<b>\$8,096</b>	<b>\$2,990</b>	<b>\$5,106</b>	<b>4.4</b>	<b>8,562</b>
<b>TOTALS (ALL MEASURES)</b>			<b>8,503</b>	<b>3.0</b>	<b>0</b>	<b>\$1,148</b>	<b>\$8,096</b>	<b>\$2,990</b>	<b>\$5,106</b>	<b>4.4</b>	<b>8,562</b>

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

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

Figure 2 – Evaluated Energy Improvements

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

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.

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

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	X	X	
ECM 2	Retrofit Fixtures with LED Lamps	X	X	
ECM 3	Install Occupancy Sensor Lighting Controls	X	X	

*Figure 3 – Funding Options*



## New Jersey's Clean Energy Programs At-A-Glance

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

Take the next step by visiting [www.njcleanenergy.com](http://www.njcleanenergy.com) for program details, applications, and to contact a qualified contractor.

### *Individual Measures with SmartStart*

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

### *Turnkey Installation with Direct Install*

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

### *Whole Building Approach with Pay for Performance*

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

## **More Options from Around the State**

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

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

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

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

### *Ongoing Electric Savings with Demand Response*

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

## 2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBP) has sponsored this Local Government Energy Audit (LGEA) Report for Recreation Building. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey’s Clean Energy Program (NJCEP) for implementing ECMs.

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

### 2.1 Site Overview

On June 25, 2020, TRC performed an energy audit at Recreation Building located in Toms River, New Jersey. TRC met with Donald Guardian to review the facility operations and help focus our investigation on specific energy-using systems.

Recreation building is a one-story, 6,464 square foot building built in 1992. Spaces include storage, conference rooms, offices, lobby, kitchen, restrooms, pool, and pool room. The pool room is served by a separate electric meter.

### 2.2 Building Occupancy

The facility is occupied year-round, typically by five full time staff, plus part time staff and a varying number of building users. The building operating hours are provided below.

Building Name	Weekday/Weekend	Operating Schedule
Recreation Building	Weekday	8:00 AM - 4:30 PM
	Weekend	11:00 AM - 6:00 PM 6:00 PM - 8:00 PM (8 months only - not during summer)

*Figure 4 - Building Occupancy Schedule*

## 2.3 Building Envelope

Building walls are made of CMUs with a vinyl weatherboard façade. The facility has a pitched roof with asphalt shingles, observed to be in good condition.

Windows at the facility are all double paned, clear, reflective, and in good condition. The windows have aluminum or wooden frames.

Exterior doors are aluminum framed glass doors that are in good condition.

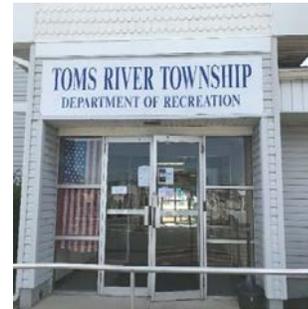
The auditor noted some draft issues, potentially the result of air leaks in the building.



*Façade and window*



*Roof*



*Exterior door*

## 2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. There are a few 40-Watt T12 fixtures in the pool shed. Additionally, there are some 75-Watt incandescent lamps and 10-Watt LED general purpose lamps serving the storage closet and the restroom, respectively. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use magnetic ballasts.

Fixture types include 2-lamp or 4-lamp, 4-foot long troffer fixtures. All fixtures are in good condition.

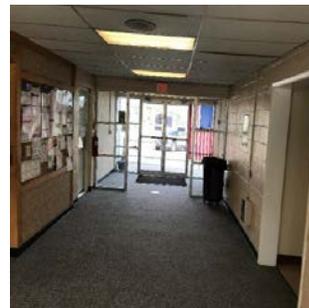
Interior lighting control is mainly accomplished with manual wall switches, Occupancy sensors have been evaluated and recommended as necessary.

Exterior lighting consists of 30-Watt and 45-Watt LED wall pack fixtures controlled using photocells.

Interior lighting levels were generally sufficient.



*Lighting*



*T8 lighting*

## 2.5 Air Handling Systems

### Heating

Heating in the facility is provided by electric baseboard heaters throughout, each with a heating capacity of 1.5 kW.

### Air Conditioners

The storage room has a window AC providing cooling. For analytical purposes, the capacity of this unit has been assumed.

The yoga room, office and storage are cooled using a 5-ton Trane split AC unit with an EER of 14. This unit was installed in 2017 and is in good condition. Conditioned air is distributed to the various rooms by an air handling unit (AHU) equipped with a 1 hp supply fan.



*Electric baseboard heater*



*Split AC unit*



*Window AC unit*



*Air handler*

## 2.6 Domestic Hot Water

There are two electric hot water heaters in the facility.

One of them, 5 kW system installed in 2015, has a 19-gallon tank capacity. This unit serves the office areas and the restrooms.

The other unit has an 80-gallon tank capacity. It is a 24-kW system installed in 2015. This unit serves the kitchen and the backside restrooms.

The hot water heaters are in good condition and is well maintained.



*80-gallon DHW*



*19-gallon DHW*

## 2.7 Plug Load & Vending Machines

You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are five computer workstations throughout the facility. Plug loads throughout the building include general café and office equipment.

## 2.8 Water-Using Systems

The faucets have a flow rate of 1.5 gallons per minute (gpm), toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

## 2.9 Process Equipment

The facility has a public swimming pool that is operated only during the summer. The pool is not equipped with a heating system.

There is a 10 hp well pump and a 2 hp pool pump. Both of these pumps operate at constant speed. Due to lack of information regarding the pump operating schedules, we have not evaluated a measure to install variable frequency drive (VFD) speed controls for these pump motors.



*2 hp pool pump*



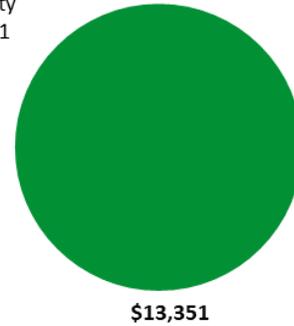
*10 hp well pump*

### 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.

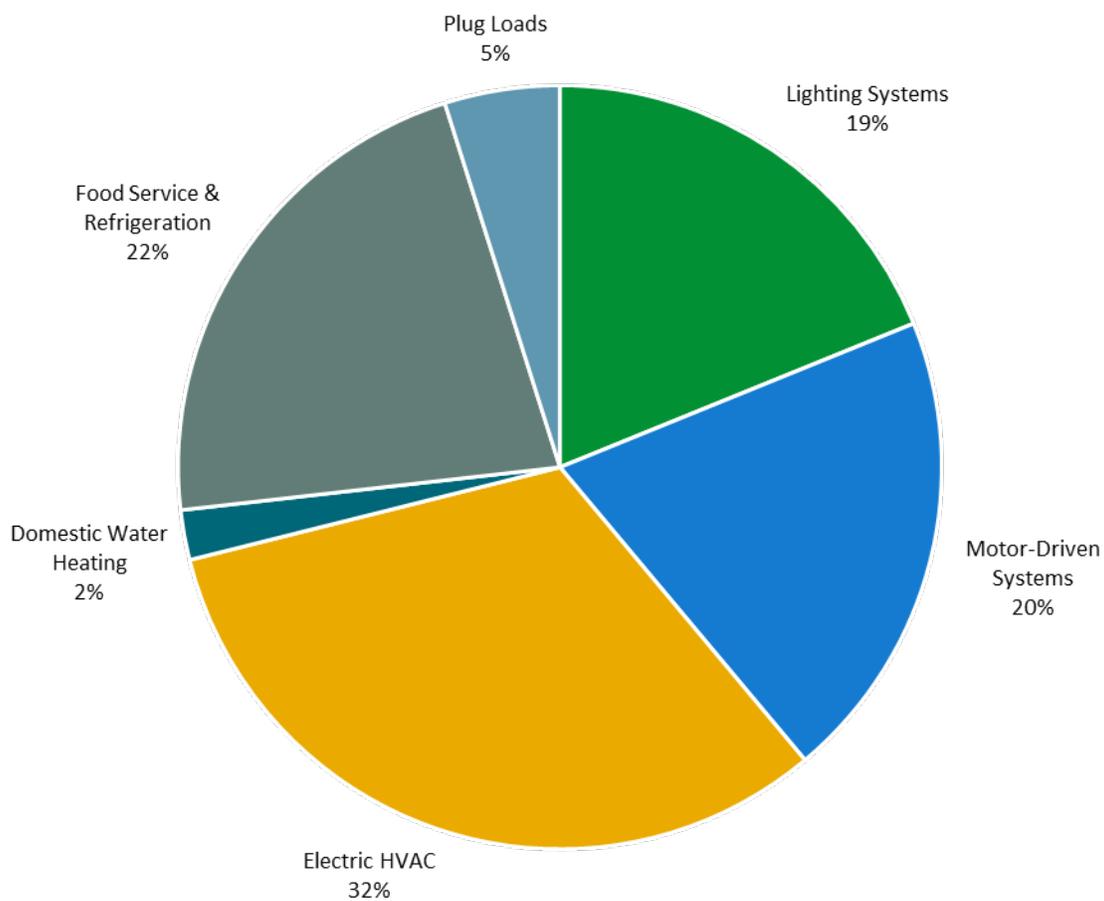
Utility Summary		
Fuel	Usage	Cost
Electricity	98,888 kWh	\$13,351
<b>Total</b>		<b>\$13,351</b>

Electricity  
\$13,351  
100%



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

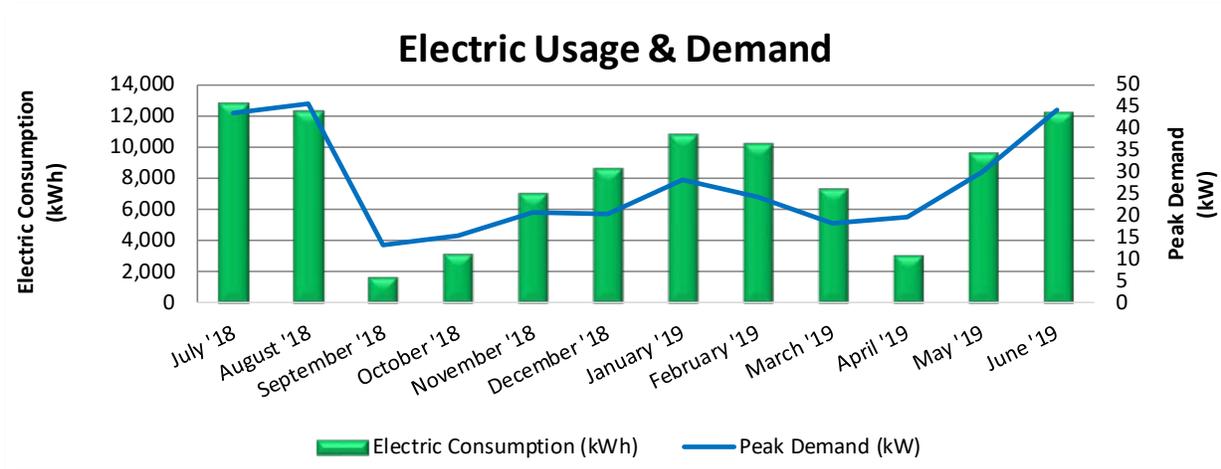
The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated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



*Figure 5 - Energy Balance*

### 3.1 Electricity

JCP&L delivers electricity under rate class General Service Secondary JC\_GS3\_1F, with electric production provided by South Jersey Energy, a third-party supplier.



Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
8/9/18	30	12,779	44		\$1,578
9/10/18	32	12,308	46		\$1,599
10/9/18	29	1,661	13		\$355
11/8/18	30	3,176	16		\$527
12/7/18	29	7,030	21		\$958
1/10/19	34	8,599	20		\$1,118
2/8/19	29	10,812	28		\$1,405
3/11/19	31	10,231	24		\$1,341
4/9/19	29	7,393	18		\$1,026
5/9/19	30	3,115	20		\$536
6/10/19	32	9,590	30		\$1,283
7/10/19	30	12,194	44		\$1,627
<b>Totals</b>	<b>365</b>	<b>98,888</b>	<b>46</b>	<b>\$0</b>	<b>\$13,351</b>
<b>Annual</b>	<b>365</b>	<b>98,888</b>	<b>46</b>	<b>\$0</b>	<b>\$13,351</b>

Notes:

- Peak demand of 46 kW occurred in August 2018.
- Average demand over the past 12 months was 27 kW.
- This chart combines 12 month of usage for the main meter (92,474 kWh/year) and 12 months of usage for the pool house, 6,414 kWh per year.
- The average electric cost over the past 12 months was \$0.135/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.

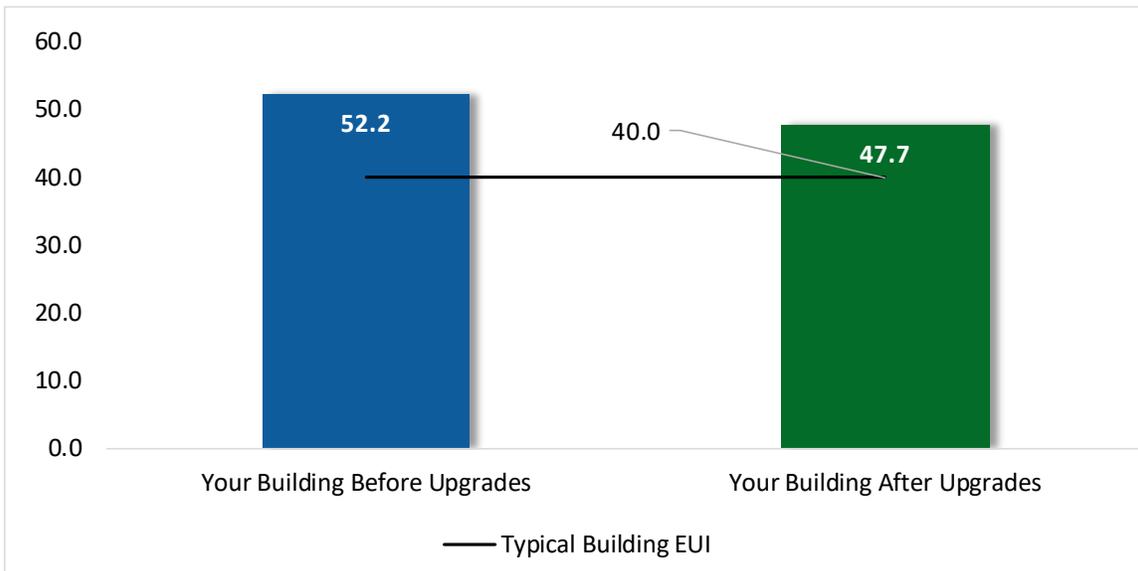
### 3.2 Benchmarking

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.

<b>Benchmarking Score</b>	<b>N/A</b>
---------------------------	------------

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



*Figure 6 - Energy Use Intensity Comparison<sup>3</sup>*

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

<sup>3</sup> Based on all evaluated ECMs

### **Tracking Your Energy Performance**

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

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

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

For more information on ENERGY STAR® and Portfolio Manager®, visit their website<sup>4</sup>.

---

<sup>4</sup> <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1>.

## 4 ENERGY CONSERVATION MEASURES

---

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

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

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

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

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 Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>			<b>6,641</b>	<b>2.4</b>	<b>0</b>	<b>\$897</b>	<b>\$4,354</b>	<b>\$2,210</b>	<b>\$2,144</b>	<b>2.4</b>	<b>6,687</b>
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	370	0.2	0	\$50	\$344	\$100	\$244	4.9	373
ECM 2	Retrofit Fixtures with LED Lamps	Yes	6,271	2.2	0	\$847	\$4,010	\$2,110	\$1,900	2.2	6,315
<b>Lighting Control Measures</b>			<b>1,862</b>	<b>0.6</b>	<b>0</b>	<b>\$251</b>	<b>\$3,742</b>	<b>\$780</b>	<b>\$2,962</b>	<b>11.8</b>	<b>1,875</b>
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	1,862	0.6	0	\$251	\$3,742	\$780	\$2,962	11.8	1,875
<b>TOTALS</b>			<b>8,503</b>	<b>3.0</b>	<b>0</b>	<b>\$1,148</b>	<b>\$8,096</b>	<b>\$2,990</b>	<b>\$5,106</b>	<b>4.4</b>	<b>8,562</b>

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

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

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>6,641</b>	<b>2.4</b>	<b>0</b>	<b>\$897</b>	<b>\$4,354</b>	<b>\$2,210</b>	<b>\$2,144</b>	<b>2.4</b>	<b>6,687</b>
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	370	0.2	0	\$50	\$344	\$100	\$244	4.9	373
ECM 2	Retrofit Fixtures with LED Lamps	6,271	2.2	0	\$847	\$4,010	\$2,110	\$1,900	2.2	6,315
<b>Lighting Control Measures</b>		<b>1,862</b>	<b>0.6</b>	<b>0</b>	<b>\$251</b>	<b>\$3,742</b>	<b>\$780</b>	<b>\$2,962</b>	<b>11.8</b>	<b>1,875</b>
ECM 3	Install Occupancy Sensor Lighting Controls	1,862	0.6	0	\$251	\$3,742	\$780	\$2,962	11.8	1,875
<b>TOTALS</b>		<b>8,503</b>	<b>3.0</b>	<b>0</b>	<b>\$1,148</b>	<b>\$8,096</b>	<b>\$2,990</b>	<b>\$5,106</b>	<b>4.4</b>	<b>8,562</b>

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

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

Figure 8 – Cost Effective ECMs

## 4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Upgrades</b>		<b>6,641</b>	<b>2.4</b>	<b>0</b>	<b>\$897</b>	<b>\$4,354</b>	<b>\$2,210</b>	<b>\$2,144</b>	<b>2.4</b>	<b>6,687</b>
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	370	0.2	0	\$50	\$344	\$100	\$244	4.9	373
ECM 2	Retrofit Fixtures with LED Lamps	6,271	2.2	0	\$847	\$4,010	\$2,110	\$1,900	2.2	6,315

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

### **ECM 1: 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:** T-12 fluorescent lamps in the pool shed.

### **ECM 2: Retrofit Fixtures with LED Lamps**

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

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

**Affected building areas:** all areas with fluorescent fixtures with T8 tubes and incandescent lamps.

## 4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO <sub>2</sub> e Emissions Reduction (lbs)
<b>Lighting Control Measures</b>		<b>1,862</b>	<b>0.6</b>	<b>0</b>	<b>\$251</b>	<b>\$3,742</b>	<b>\$780</b>	<b>\$2,962</b>	<b>11.8</b>	<b>1,875</b>
ECM 3	Install Occupancy Sensor Lighting Controls	1,862	0.6	0	\$251	\$3,742	\$780	\$2,962	11.8	1,875

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

### **ECM 3: Install Occupancy Sensor Lighting Controls**

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

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

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

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

**Affected building areas:** offices, conference rooms, restrooms, and storage rooms.

### 4.3 Measures for Future Consideration

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

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

- evaluate these measures further
- develop firm costs
- determine measure savings
- prepare detailed implementation plans.

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

#### **Pool System Upgrades**

The facility includes a pool for which several energy savings options could be further investigated. In general, there are a few options to improve the pool system. These measures are beyond the scope of this LGEA report and it is recommended that a contractor who specializes in pool systems be consulted.

- 1) *If pool heating is desired, consider the installation of a solar pool hot water system.* Solar hot water heating systems are used to preheat pool water using solar panels and heat exchangers. Because the water is pre-heated, less heating energy is required by fossil fuel sources to bring pool water up to the required temperatures
- 2) *Reduce turnover of pool water.* Regulations require that pool water be circulated through filtering systems so that that pool water is regularly “replaced” by filtered water, measured by “turnover”. The turnover rate of a swimming pool is the amount of time it takes for the pumping and filtration systems to cycle all of the water in the pool one time, meaning all of the water in the pool has been filtered and cleaned. In cases where the turnover is higher than required by state laws or local ordinance, variable speed drives can often be used to control the speed of the circulation pumps, saving energy. In some jurisdictions the turnover rate can be reduced when the pool is not occupied for a significant period of time. A pool expert can measure the turnover and evaluate whether the filtration system can accommodate reduced flow.
- 3) *Install an automatic pool cover.* Installing a pool cover will reduce the energy use (if the pool is heated), or otherwise help maintain water temperatures through better heat retention. Consider installing a retractable pool cover which will reduce pool water evaporation during unoccupied periods of time. Evaporation occurs when the pool water is heated to a temperature above the temperature of the air. Reducing evaporation from the pool surface will result in water savings, reduced chemical treatment and pool water heating energy (if any). Implementation of this measure would require installation of pool cover, reel system and control system.

### **Upgrade to a Heat Pump System**

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

Electric resistance heat, including electric furnaces and baseboard heaters can be inexpensive to install but often expensive to run. Facilities with these systems can save substantial energy at a moderate cost by installing a heat pump when they replace a central air conditioner. Even in buildings without central air-conditioning, there are opportunities to save energy when an existing electric furnace needs to be replaced, as well as opportunities to install ductless electric heat pumps in buildings with baseboard electric heaters. Electric heat pumps have high coefficient of performance (COP) ratings and are substantially more efficient than traditional electric heating systems. Further investigation is required to determine whether installing a heat pump system is a cost-effective solution when replacing existing electrical heating systems.

## 5 ENERGY EFFICIENT BEST PRACTICES

---

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

Operation and maintenance (O&M) plans enhance the operational efficiency of HVAC and other energy intensive systems and could save between 5 to 20 percent 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, planned capital upgrades, and 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 will 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 can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions<sup>5</sup>. 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 and thus providing energy savings and increased occupant comfort.

### **Doors and Windows**

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

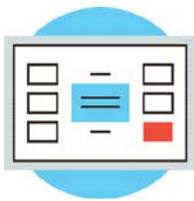
---

<sup>5</sup> <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.

## **Thermostat Schedules and Temperature Resets**



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

## **AC System Evaporator/Condenser Coil Cleaning**

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

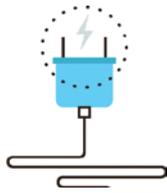
## **Water Heater Maintenance**

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

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

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

## Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips<sup>6</sup>. Your local utility may offer incentives or rebates for this equipment.

## Water Conservation



Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense<sup>®</sup> 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<sup>®</sup> website<sup>7</sup> or download a copy of EPA's "WaterSense<sup>®</sup> at Work: Best Management Practices for Commercial and Institutional Facilities"<sup>8</sup> to get ideas for creating a water management plan and best practices for a wide range of water using systems.

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

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

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

## Procurement Strategies

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

---

<sup>6</sup> For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" <http://www.nrel.gov/docs/fy13osti/54175.pdf>, or "Plug Load Best Practices Guide" <http://www.advancedbuildings.net/plug-load-best-practices-guide-offices>.

<sup>7</sup> <https://www.epa.gov/watersense>.

<sup>8</sup> <https://www.epa.gov/watersense/watersense-work-0>.

## 6 ON-SITE GENERATION

---

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

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

## 6.1 Solar Photovoltaic

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

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

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

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

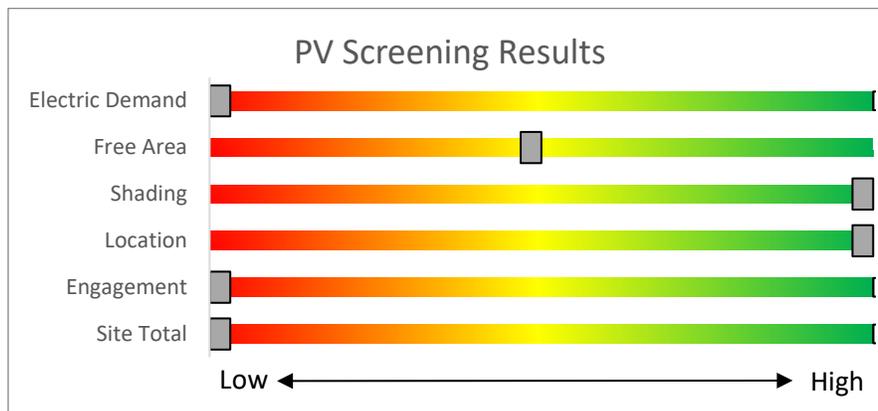


Figure 9 - Photovoltaic Screening

### Transition Incentive (TI) Program

The TI program is a bridge between the Legacy SREC Program and a to-be determined Successor Incentive Program. The program is used to register the intent to install 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 TRECs (Transition Incentive Renewable Energy Certificates). The Transition Incentive is structured as a factorized renewable energy certificate. The factors allow the TI Program to provide differentiated financial incentives for different types of solar installation.

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:

**Transition Incentive (TI) Program:** <https://www.njcleanenergy.com/renewable-energy/programs/transition-incentive-program>

- **Basic Info on Solar PV in NJ:** [www.njcleanenergy.com/whysolar](http://www.njcleanenergy.com/whysolar).
- **NJ Solar Market FAQs:** [www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs](http://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](http://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) generate electricity at the facility and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

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

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

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

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

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

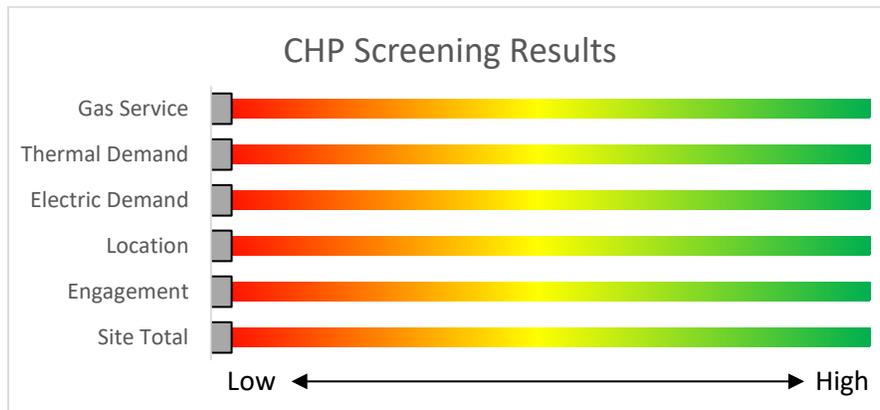


Figure 10 - Combined Heat and Power Screening

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/](http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/).

## 7 PROJECT FUNDING AND INCENTIVES

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

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

## 7.1 SmartStart



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

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

### **Equipment with Prescriptive Incentives Currently Available:**

*Electric Chillers*  
*Electric Unitary HVAC*  
*Gas Cooling*  
*Gas Heating*  
*Gas Water Heating*  
*Ground Source Heat Pumps*  
*Lighting*

*Lighting Controls*  
*Refrigeration Doors*  
*Refrigeration Controls*  
*Refrigerator/Freezer Motors*  
*Food Service Equipment*  
*Variable Frequency Drives*

### **Incentives**

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

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

### **How to Participate**

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

Visit [www.njcleanenergy.com/SSB](http://www.njcleanenergy.com/SSB) for a detailed program description, instructions for applying, and applications.

## 7.2 Direct Install



Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for

installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

### Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to \$125,000 per project. Each entity is limited to incentives up to \$250,000 per fiscal year.

### How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30% of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: [www.njcleanenergy.com/DI](http://www.njcleanenergy.com/DI).

## 7.3 Pay for Performance - Existing Buildings



Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings.

P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program 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.

Based on the site building and utility data provided, the facility does not meet the requirements of the current P4P program.

### Incentives

Incentives are based on estimated and achieved energy savings ranging from \$0.18-\$0.22/kWh and \$1.80-\$2.50/therm, capped at the lesser of 50% total project cost, or \$1 million per electric account and \$1 million per natural gas account, per fiscal year, not to exceed \$2 million per project. An incentive of \$0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

### How to Participate

Contact one of the pre-approved consultants and contractors (“Partners”). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan), assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at: [www.njcleanenergy.com/P4P](http://www.njcleanenergy.com/P4P).

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

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

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

### How to Participate

You 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](http://www.njcleanenergy.com/CHP).

## 7.5 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 ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

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

### How to Participate

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

- (1) Use an energy services company or "ESCO."
- (2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.
- (3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

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

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

## 7.6 Transition Incentive (TI) Program

The TI program is a bridge between the Legacy SREC Program and a to-be determined Successor Incentive Program. The program is used to register the intent to install 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 TRECs (Transition Incentive Renewable Energy Certificates). The Transition Incentive is structured as a factorized renewable energy certificate. The factors allow the TI Program to provide differentiated financial incentives for different types of solar installations. NJBPU calculates the value of a Transition Renewable Energy Certificate (TREC) by multiplying the base compensation rate (\$152/MWh) by the project’s assigned factor (i.e.  $\$152 \times 0.85 = \$129.20/\text{MWh}$ ). The TREC factors are defined based on the chart below:

Project Type	Factor
Subsection (t): landfill, brownfield, areas of historic fill	1.00
Grid supply (Subsection (r)) rooftop	1.00
Net metered non-residential rooftop and carport	1.00
Community solar	0.85
Grid supply (Subsection (r)) ground mount	0.60
Net metered residential ground mount	0.60
Net metered residential rooftop and carport	0.60
Net metered non-residential ground mount	0.60

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey TRECs.

Eligible projects may generate TRECs for 15 years following the commencement of commercial operations (also referred to as the “Transition Incentive Qualification Life”). After 15 years, projects may be eligible for a NJ Class I REC.

TRECs will be used by the identified compliance entities to satisfy a compliance obligation tied to a new Transition Incentive Renewable Portfolio Standard (“TI-RPS”), which will exist in parallel with, and completely separate from, the existing Solar RPS for Legacy SRECs. The TI-RPS is a carve-out of the current Class I RPS requirement. The creation of TRECs is based upon metered generation supplied to PJM-EIS General Attribute Tracking System (“GATS”) by the owners of eligible facilities or their agents. GATS would create one TREC for each MWh of energy produced from a qualified facility.

TRECs will be purchased monthly by a TREC Administrator who will allocate the TRECs 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.

Solar projects help the State of New Jersey reach renewable energy goals outlined in the state’s Energy Master Plan. The Transition Incentive Program online portal is now open to new applications effective May 1, 2020. There are instructions on “How and When to Transfer my SRP Registration to the Transition Incentive Program”. If you are considering installing solar photovoltaics on your building, visit the following link for more information:

<https://www.njcleanenergy.com/renewable-energy/programs/transition-incentive-program>

## 8 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

---

### 8.1 Retail Electric Supply Options

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

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

A list of licensed third-party electric suppliers is available at the NJBPU website<sup>9</sup>.

### 8.2 Retail Natural Gas Supply Options

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

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

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

A list of licensed third-party natural gas suppliers is available at the NJBPU website<sup>10</sup>.

---

<sup>9</sup> [www.state.nj.us/bpu/commercial/shopping.html](http://www.state.nj.us/bpu/commercial/shopping.html).

<sup>10</sup> [www.state.nj.us/bpu/commercial/shopping.html](http://www.state.nj.us/bpu/commercial/shopping.html).

# APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

## Lighting Inventory & Recommendations

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Office Director	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,108	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,144	0.2	680	0	\$92	\$562	\$230	3.6
Storage room	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	700	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	483	0.2	153	0	\$21	\$562	\$160	19.4
Conference room	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,825	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,949	0.2	619	0	\$84	\$562	\$230	4.0
Main office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,108	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,144	0.3	1,021	0	\$138	\$708	\$310	2.9
Main office	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
Office 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,108	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,144	0.2	680	0	\$92	\$562	\$230	3.6
Office 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,108	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,144	0.2	680	0	\$92	\$562	\$230	3.6
Pantry	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,825	2, 3	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,949	0.0	88	0	\$12	\$153	\$60	7.8
Men's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,825	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,825	0.0	69	0	\$9	\$37	\$20	1.8
Men's restroom	1	LED Lamps: Screw-in 2 lamps	Wall Switch	S	10	2,825		None	No	1	LED Lamps: Screw-in 2 lamps	Wall Switch	10	2,825	0.0	0	0	\$0	\$0	\$0	0.0
Women's restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,825	2	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,825	0.0	117	0	\$16	\$73	\$40	2.1
Restroom lobby	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,108	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,108	0.0	76	0	\$10	\$37	\$20	1.6
Restroom lobby	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
Main lobby	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,108	2, 3	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,144	0.2	851	0	\$115	\$635	\$270	3.2
Main lobby	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
Kitchen	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,825	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,949	0.2	619	0	\$84	\$562	\$230	4.0
Exterior floods	1	LED - Fixtures: Other	Photocell	S	30	4,380		None	No	1	LED - Fixtures: Other	Photocell	30	4,380	0.0	0	0	\$0	\$0	\$0	0.0
Pool restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,825	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,949	0.2	619	0	\$84	\$562	\$230	4.0
Office pool	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,108	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,144	0.1	193	0	\$26	\$189	\$80	4.2
Storage	1	Incandescent: Screw-in 1 lamp	Wall Switch	S	75	700	2	Relamp	No	1	LED Lamps: Screw-in 1 lamp	Wall Switch	11	700	0.0	33	0	\$4	\$35	\$2	7.4
Yoga room	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,108	2, 3	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,144	0.3	1,021	0	\$138	\$708	\$310	2.9
Yoga room	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
Yoga storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	700	2, 3	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	483	0.2	153	0	\$21	\$562	\$160	19.4
Pool shed	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	1,695	1, 3	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,170	0.2	426	0	\$58	\$614	\$170	7.7
Pool storage	4	Incandescent: PAR 38 - 1 lamp	Wall Switch	S	90	1,695	2, 3	Relamp	Yes	4	LED Lamps: PAR 38 - 1 lamp	Occupancy Sensor	14	1,170	0.2	405	0	\$55	\$411	\$8	7.4

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Exterior	1	LED - Fixtures: Other	Photocell	S	45	4,380		None	No	1	LED - Fixtures: Other	Photocell	45	4,380	0.0	0	0	\$0	\$0	\$0	0.0

### Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions				Energy Impact & Financial Analysis							
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Outdoor	Yoga room, office and storage	1	Supply Fan	1.0	85.5%	No		2,745		No	85.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Pool room	Pool	1	Process Pump	2.0	86.5%	No	W	2,745		No	86.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Pool room	Pool	1	Process Pump	10.0	93.7%	No	W	2,160		No	93.7%	No		0.0	0	0	\$0	\$0	\$0	0.0
Pool room	Pool	3	Process Pump	0.1	60.0%	No		2,745		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0

### Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis					
		System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives
Office Director	Office Director	2	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Storage room	Storage room	4	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Conference room	Conference room	3	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Storage room	Storage room	1	Window AC	1.00				No						0.0	0	0	\$0	\$0	\$0	0.0
Main office	Main office	3	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Office 1	Office 1	1	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Office 2	Office 2	1	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Men's restroom	Men's restroom	1	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Women's restroom	Women's restroom	1	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Yoga room	Yoga room	5	Electric Resistance Heat		5.12			No						0.0	0	0	\$0	\$0	\$0	0.0
Outdoor	Yoga room, office and storage	1	Split-System AC	5.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0

### DHW Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
		System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Recreation building	Closet	1	Storage Tank Water Heater (≤ 50 Gal)	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Pool room	Facility	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	\$0	\$0	\$0	0.0

### Commercial Refrigerator/Freezer Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Freezer Chest	No		No	0.0	0	0	\$0	\$0	\$0	0.0

### Commercial Ice Maker Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Ice Maker Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Ice Making Head (<450 lbs/day), Batch	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0

### Cooking Equipment Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Equipment Type	High Efficiency Equipment?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Electric Fryer	No		No	0.0	0	0	\$0	\$0	\$0	0.0

**Plug Load Inventory**

Existing Conditions				
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Recreation building	5	Desktop Computer	145	Yes
Recreation building	5	Printer - Small	60	Yes
Recreation building	2	Printer - big	200	Yes
Recreation building	2	Microwave	900	Yes
Recreation building	1	Refrigerator - Small	70	Yes
Recreation building	4	Refrigerator - large	220	Yes
Recreation building	1	Coffee machine	400	Yes
Recreation building	1	Toaster	900	Yes
Recreation building	1	Toaster oven	1,200	Yes
Recreation building	1	Ceiling fan	60	Yes
Recreation building	1	Portable fan	60	Yes
Recreation building	1	Dehumidifier	300	Yes

# APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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

## ENERGY STAR® Statement of Energy Performance

**ENERGY STAR®  
Score<sup>1</sup>**

### Toms River Recreation Building

Primary Property Type: Other - Recreation  
Gross Floor Area (ft²): 10,000  
Built: 1992

For Year Ending: June 30, 2019  
Date Generated: June 09, 2020

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			
<b>Property Address</b> Toms River Recreation Building 1810 Warren Point Road Toms River, New Jersey 08753	<b>Property Owner</b> Township of Toms River 33 Washington Street Toms River, NJ 08753 (742) 341-1000	<b>Primary Contact</b> Donald Guardian 33 Washington Street Toms River, NJ 08753 (742) 341-1000 dguardian@tomsrivertownship.com	
<b>Property ID:</b> 10864936			
Energy Consumption and Energy Use Intensity (EUI)			
<b>Site EUI</b> 33.8 kBtu/ft²	<b>Annual Energy by Fuel</b> Electric - Grid (kBtu) 338,050 (100%)	<b>National Median Comparison</b> National Median Site EUI (kBtu/ft²) 40 National Median Source EUI (kBtu/ft²) 112 % Diff from National Median Source EUI -16%	
<b>Source EUI</b> 94.7 kBtu/ft²	<b>Annual Emissions</b> Greenhouse Gas Emissions (Metric Tons CO2e/year) 34		

### 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
<b>Blended Rate</b>	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.
<b>Btu</b>	<i>British thermal unit</i> : a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
<b>CHP</b>	<i>Combined heat and power</i> . Also referred to as cogeneration.
<b>COP</b>	<i>Coefficient of performance</i> : a measure of efficiency in terms of useful energy delivered divided by total energy input.
<b>Demand Response</b>	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.
<b>DCV</b>	<i>Demand control ventilation</i> : a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
<b>US DOE</b>	<i>United States Department of Energy</i>
<b>EC Motor</b>	<i>Electronically commutated motor</i>
<b>ECM</b>	<i>Energy conservation measure</i>
<b>EER</b>	<i>Energy efficiency ratio</i> : a measure of efficiency in terms of cooling energy provided divided by electric input.
<b>EUI</b>	<i>Energy Use Intensity</i> : measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
<b>Energy Efficiency</b>	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.
<b>ENERGY STAR®</b>	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
<b>EPA</b>	<i>United States Environmental Protection Agency</i>
<b>Generation</b>	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
<b>GHG</b>	<i>Greenhouse gas</i> 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.
<b>gpf</b>	<i>Gallons per flush</i>

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

---

<b>SEER</b>	<i>Seasonal energy efficiency ratio</i> : a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
-------------	---

---

<b>SEP</b>	<i>Statement of energy performance</i> : a summary document from the ENERGY STAR® Portfolio Manager®.
------------	---

---

<b>Simple Payback</b>	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
-----------------------	--

---

<b>SREC</b>	<i>Solar renewable energy credit</i> : a credit you can earn from the state for energy produced from a photovoltaic array.
-------------	--

---

<b>TREC</b>	<i>Transition Incentive Renewable Energy Certificate</i> : a factorized renewable energy certificate you can earn from the state for energy produced from a photovoltaic array.
-------------	---

---

<b>T5, T8, T12</b>	A reference to a linear lamp diameter. The number represents increments of 1/8 <sup>th</sup> of an inch.
--------------------	--

---

<b>Temperature Setpoint</b>	The temperature at which a temperature regulating device (thermostat, for example) has been set.
-----------------------------	--

---

<b>therm</b>	100,000 Btu. Typically used as a measure of natural gas consumption.
--------------	--

---

<b>tons</b>	A unit of cooling capacity equal to 12,000 Btu/hr.
-------------	--

---

<b>Turnkey</b>	Provision of a complete product or service that is ready for immediate use
----------------	--

---

<b>VAV</b>	<i>Variable air volume</i>
------------	----------------------------

---

<b>VFD</b>	<i>Variable frequency drive</i> : a controller used to vary the speed of an electric motor.
------------	---

---

<b>WaterSense®</b>	The symbol for water efficiency. The WaterSense® program is managed by the EPA.
--------------------	---

---

<b>Watt (W)</b>	Unit of power commonly used to measure electricity use.
-----------------	---

---