Local Government Energy Audit Report

OTC Recycling

December 20, 2019

Prepared for:

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

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. 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.

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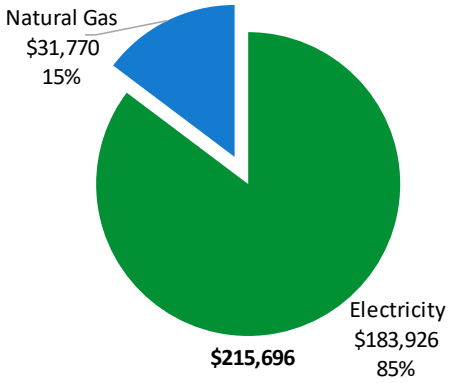
1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for OTC Recycling. This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in your facility. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $215,696 Electricity: 1,596,081 kWh Natural Gas: 35,200 Therms	
ENERGY STAR® Benchmarking Score	N/A *(1-100 scale)*	A standard energy use benchmark is not available for this facility type. This report contains suggestions about how to improve building performance and reduce energy costs.

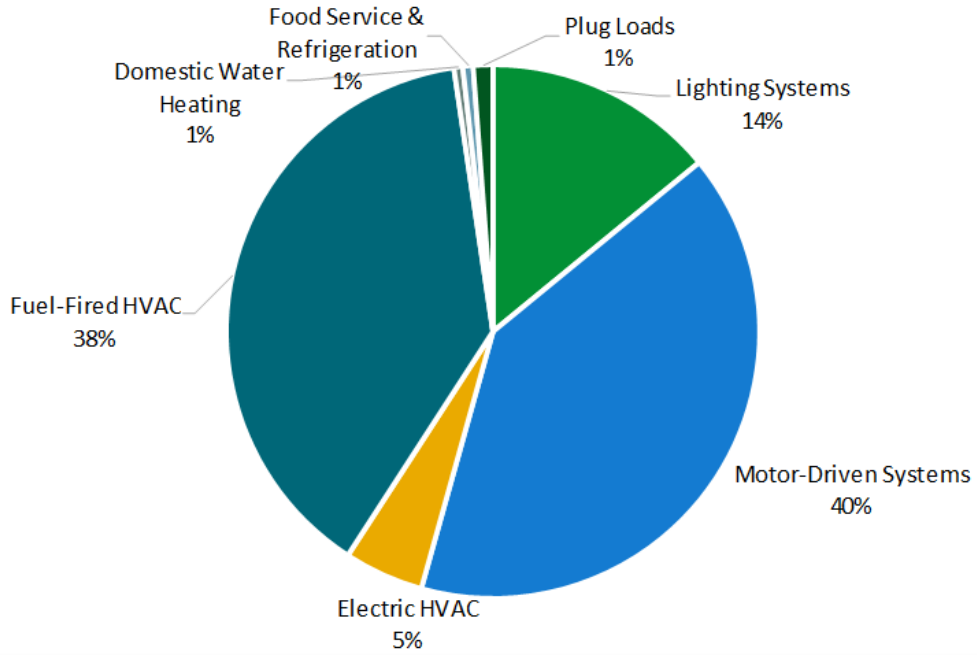


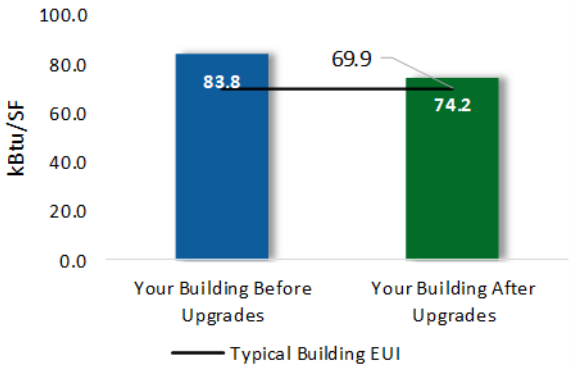
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

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

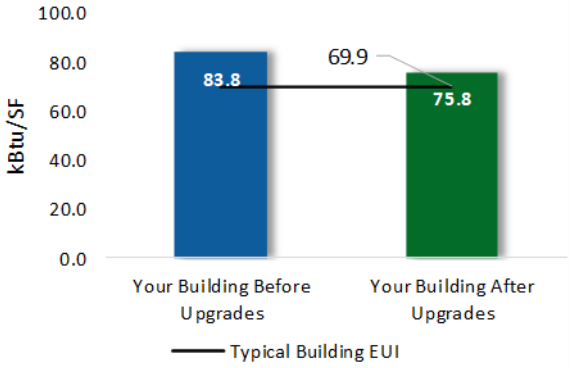
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$304,193
Potential Rebates & Incentives[1]	$50,926
Annual Cost Savings	$34,744
Annual Energy Savings	Electricity: 302,008 kWh
Greenhouse Gas Emission Savings	152 Tons
Simple Payback	7.3 Years
Site Energy Savings (all utilities)	11%



Scenario 2: Cost Effective Package[2]

Installation Cost	$103,852
Potential Rebates & Incentives	$31,034
Annual Cost Savings	$29,682
Annual Energy Savings	Electricity: 260,340 kWh
Greenhouse Gas Emission Savings	129 Tons
Simple Payback	2.5 Years
Site Energy Savings (all utilities)	10%



On-site Generation Potential

Photovoltaic	Medium
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	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_2e Emissions Reduction (lbs)
Lighting Upgrades			**227,392**	**39.5**	**-36**	**$25,879**	**$77,762**	**$25,974**	**$51,788**	**2.0**	**224,765**
ECM 1	Install LED Fixtures	Yes	57,696	0.0	0	$6,649	$36,271	$8,200	$28,071	4.2	58,099
ECM 2	Retrofit Fixtures with LED Lamps	Yes	169,525	39.5	-36	$19,211	$41,274	$17,774	$23,500	1.2	166,499
ECM 3	Install LED Exit Signs	Yes	170	0.0	0	$19	$217	$0	$217	11.3	167
Lighting Control Measures			**5,667**	**1.0**	**-1**	**$642**	**$4,907**	**$2,010**	**$2,897**	**4.5**	**5,565**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	4,510	0.8	-1	$511	$3,782	$900	$2,882	5.6	4,429
ECM 5	Install High/Low Lighting Controls	Yes	1,157	0.2	0	$131	$1,125	$1,110	$15	0.1	1,136
Motor Upgrades			**6,906**	**3.0**	**0**	**$796**	**$18,786**	**$0**	**$18,786**	**23.6**	**6,954**
ECM 6	Premium Efficiency Motors	No	6,906	3.0	0	$796	$18,786	$0	$18,786	23.6	6,954
Variable Frequency Drive (VFD) Measures			**16,166**	**4.9**	**0**	**$1,863**	**$19,062**	**$2,400**	**$16,662**	**8.9**	**16,279**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	16,166	4.9	0	$1,863	$19,062	$2,400	$16,662	8.9	16,279
Electric Unitary HVAC Measures			**34,762**	**17.4**	**0**	**$4,006**	**$152,916**	**$14,292**	**$138,624**	**34.6**	**35,005**
ECM 8	Install High Efficiency Air Conditioning Units	No	34,762	17.4	0	$4,006	$152,916	$14,292	$138,624	34.6	35,005
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**29**	**$261**	**$28,639**	**$5,600**	**$23,039**	**88.3**	**3,384**
ECM 9	Install High Efficiency Furnaces	No	0	0.0	29	$261	$28,639	$5,600	$23,039	88.3	3,384
Domestic Water Heating Upgrade			**417**	**0.0**	**2**	**$65**	**$50**	**$50**	**$0**	**0.0**	**642**
ECM 10	Install Low-Flow DHW Devices	Yes	417	0.0	2	$65	$50	$50	$0	0.0	642
Food Service & Refrigeration Measures			**10,699**	**1.2**	**0**	**$1,233**	**$2,070**	**$600**	**$1,470**	**1.2**	**10,773**
ECM 11	Vending Machine Control	Yes	10,699	1.2	0	$1,233	$2,070	$600	$1,470	1.2	10,773
TOTALS (COST EFFECTIVE MEASURES)			**260,340**	**46.6**	**-35**	**$29,682**	**$103,852**	**$31,034**	**$72,818**	**2.5**	**258,025**
TOTALS (ALL MEASURES)			**302,008**	**67.0**	**-6**	**$34,744**	**$304,193**	**$50,926**	**$253,267**	**7.3**	**303,368**

* - 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	Install LED Fixtures	X		
ECM 2	Retrofit Fixtures with LED Lamps	X		
ECM 3	Install LED Exit Signs			
ECM 4	Install Occupancy Sensor Lighting Controls	X		
ECM 5	Install High/Low Lighting Controls	X		
ECM 6	Premium Efficiency Motors			
ECM 7	Install VFDs on Constant Volume (CV) Fans	X		
ECM 8	Install High Efficiency Air Conditioning Units	X		
ECM 9	Install High Efficiency Furnaces	X		
ECM 10	Install Low-Flow DHW Devices	X		
ECM 11	Vending Machine Control	X		

Figure 3 – Funding Options

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

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

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

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

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

2.1 Site Overview

On August 29, 2019, TRC performed an energy audit at OTC Recycling located in Mount Holly, New Jersey. TRC met with Timothy E. Whelihan to review the facility operations and help focus our investigation on specific energy-using systems.

The Regional Recycling Program is funded by the Board of Chosen Freeholders and is operated by the Occupational Training Center of Burlington County, Inc (OTC). The OTC is a private, non-profit agency that trains and employs individuals with disabilities.

The Regional Recycling Program operates out of the Robert C. Shinn, Jr. Recycling Center in Westhampton, New Jersey. Recycling vehicles are dispatched from the Center and collect items from single family homes, multifamily complexes, public schools, and municipal drop-off sites. The recyclables collected are brought back to the center, processed, and shipped to a variety of markets by the OTC.

The facility is a 2-story, 107,000 square foot building built in 1985. Spaces include: offices, production areas, fleet maintenance garage, conference rooms, a nurse station, a gymnasium, a break room, storage, and mechanical spaces.

2.2 Building Occupancy

The recycling facility operates on a 12-months schedule. It is open Monday through Friday. The general operating hours and production hours are in the below table. Based on the facility reporting, the typical weekday occupancy is about 100 people.

Building Name	Weekday/Weekend	Operating Schedule
Robert C. Shinn Jr Recycling Center General Operating Hours	Weekday	4:30 AM - 10:30 PM
	Weekend	Closed
Robert C. Shinn Jr Recycling Center General Production Hours	Weekday	7:00 AM - 3:30 PM
	Weekend	Closed

Figure 4 - Building Occupancy Schedule

OTC Recycling Plant Diagram

2.3 Building Envelope

The walls are made of concrete masonry units (CMUs) and are finished with a brick veneer on the lower side and metal standing seam on the upper side.

Steel trusses support a flat roof with a metal deck covered with a standing seam metal roofing system. The roof is in fair condition with some spot leaks.

The office section of the building has single glazed, low-e glass windows that have aluminum frames with a thermal break. The glass-to-frame seals are in good condition, showing little evidence of excessive wear. Exterior doors have metal frames and are in fair condition with worn door seals. The production areas have seven standard doors while the fleet maintenance garage has two motorized rollup doors made of metal.

Building Walls

Standing Seam Metal Roof

Exterior Door

Motorized Rollup Doors

Single Paned Windows

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. The fixtures use electronic ballasts. The production and fleet maintenance areas are mainly illuminated using high bay, high output T5 and T8 fixtures. There are a few LED and compact fluorescent screw-based lamps, including in the conference room and old entrance areas.

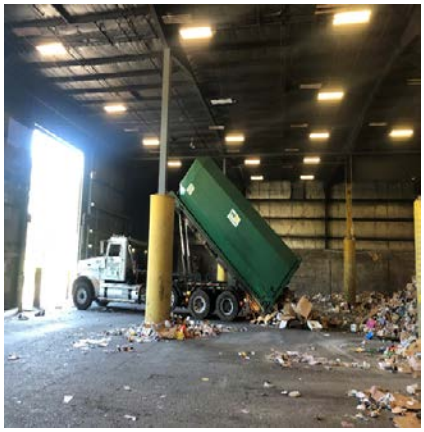
Fixture types include 3-lamp, 2- or 4-foot long troffer, recessed, surface mounted fixtures. Most exit signs are LED, however, there are a few compact fluorescent lamp units.

Most lighting fixtures are controlled by occupancy sensors and the remainder by wall switches. Spaces such as the production areas and fleet maintenance garage have fluorescent T8 and T5 troffers with an onboard occupancy sensor control system. Occupancy sensors in the offices and other areas are either ceiling or wall mounted.

Interior lighting levels were generally sufficient.

Exterior illumination is provided with a combination of metal halide (250-Watt, 320-Watt, 400-Watt, 1,000-Watt), high pressure sodium (250-Watt and 400-Watt), and CFL fixtures (42-Watt) all controlled with photocells. Exterior fixtures are wall, pole, and ground mounted.

Fleet Maintenance Garage Lights



Production Areas Lights

Typical Office Surface Mounted T8

Break Room Lights

Ceiling Mounted Occupancy Sensor

Wall Mounted Occupancy Sensor

LED Exit Sign

Pole Mounted HID Fixture

Ground Mounted HID Fixture

HID Wall Pack Fixtures

2.5 Air Handling Systems

Packaged Units

Several building areas are served with five Lennox and two Carrier rooftop packaged units controlled by room thermostats. They provide direct expansion (DX) cooling and gas fired heating to spaces. These units are all constant volume air units and do not use a heat recovery system, however, the Lennox units are equipped with economizers to provide free cooling when the outside temperature is lower than the interior temperature. Each Lennox unit has a 10-ton cooling and 216 MBh heating capacity. The two Carrier units are 4 ton and 5 ton, each with a heating capacity of 92 MBh. All the packaged units have passed their useful life and appear in poor condition. They have been evaluated for replacement.

Additional heating in the fleet maintenance garage and the production area is provided by ceiling mounted gas fired warm air units that vary in capacity between 60 MBh and 182 MBh. The fleet maintenance garage also has one 886.4 MBh CaptiveAire gas fired furnace. The units appear in good condition and are controlled with local thermostats.

Refer to Appendix A for detailed information about each unit.

Rooftop Packaged Units

Air Conditioners

Building areas including offices, hallways, the break room, conference rooms and other small spaces are served by split system air conditioners (ACs), which typically consist of a condensing unit and a fan coil located in the ductwork. The fan coil units are either located in the closet or above the ceiling. Units #6, 7, and 11 have an indoor gas-fired furnaces and a DX coil. The cooling coil is connected to an exterior condensing unit. There are 12 split system ACs, ten of which have passed their useful life and appear in poor condition. They have been evaluated for replacement.

The split system ACs vary in capacity between 1.5 ton and 5 ton. They are controlled with programmable thermostats. Room 203 is served with a 0.75-ton window AC unit, while a packaged terminal heat pump (PTHP) with a respective cooling and heating capacity of 1.23 ton and 12 MBh serves a small office.

Split System Air Conditioners

Indoor Fan Coil Unit

PTHP & Programmable Thermostat

CaptiveAire Gas Fired Unit

Nodine Warm Aire Unit

2.6 Motors and Process Pumps

There are approximately 116 motors at various production areas accomplishing different functions such as driving a conveyor belts and other process equipment. The motors and process pumps account for about 66% of the facility electricity consumption. Motors vary in capacity between 0.2 hp to 150 hp. There are two Balers that are used to compress recyclable and waste materials into small, manageable bales. Baler-1 has a 150 hp motor, a 7.5 hydraulic pump, and a 5 hp fan motor. Baler-2 has two 100 hp motors, a 10 hp hydraulic pump, and a 7.5 hp fan motor. There is a 40 hp main compressor located in the compressor room that provides compressed air to pneumatically operated process equipment. Additionally, there are three 30 hp floor pumps (C211, C212, C213) each with a 5 hp fan motor. The main compressor and the floor pumps motors run at constant speed. The facility has recently installed a new 30 hp Donaldson Torit dust collector.

Some motors are operated by variable frequency drives. The motors vary in condition and efficiency. All the motors with low efficiency have been evaluated for replacement and variable frequency drives have been recommended for selected process equipment.

Baler & Motor

Process Driving Motors

Floor Pumps

Dust Collector Pump

40 hp Air Compressor

2.7 Domestic Hot Water

The hot water system consists of two electric and two gas-fired storage tank water heaters. Two 19 gallon 1.5 kW heaters provide hot water to the break room (cafeteria) and some restrooms. Hot water for other areas is produced using 38 and 50 gallon gas fired heaters with respective input capacities of 40 MBh and 50 MBh and efficiency ratings of 80%. The water heaters are in good condition.

38 Gallon Gas-Fired & 19 Gallon Electric Water Heaters

2.8 Refrigeration

The break room (cafeteria) has a commercial standup solid door refrigerator and two commercial ice machines. The units are high efficiency and are in good condition.

Refrigeration System

2.9 Plug Load & Vending Machines

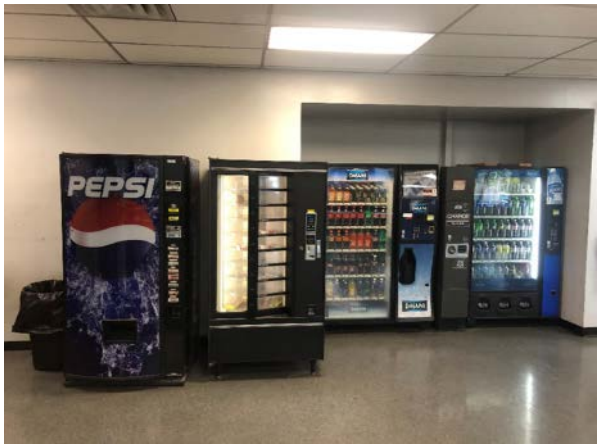
The location is doing a great job managing their electrical plug loads. This report makes additional suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are approximately 15 computer work stations throughout the facility. Plug loads throughout the building include general café and office equipment. There are five residential style refrigerators throughout the facility.

There are five refrigerated beverage vending machines and two non-refrigerated vending machines located in the cafeteria. Vending machines are not equipped with occupancy-based controls.

Copy Machine

Residential Style Refrigerator



Vending Machines

Water Cooler

2.10 Water-Using Systems

There are several restrooms with toilets, urinals, and sinks. Some faucet flow rates are at 2.2 gallons per minute (gpm) or higher. Toilets are rated at 2.5 gallons per flush (gpf) and urinals are rated at 2.5 gpf.

There is a restroom with showers. The showerheads are rated as low flow.

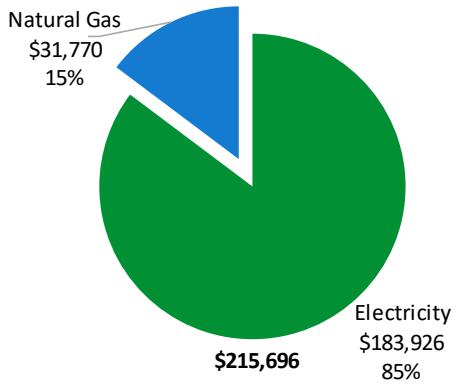
Sinks

Showerheads

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	1,596,081 kWh	$183,926
Natural Gas	35,200 Therms	$31,770
Total		**$215,696**



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.

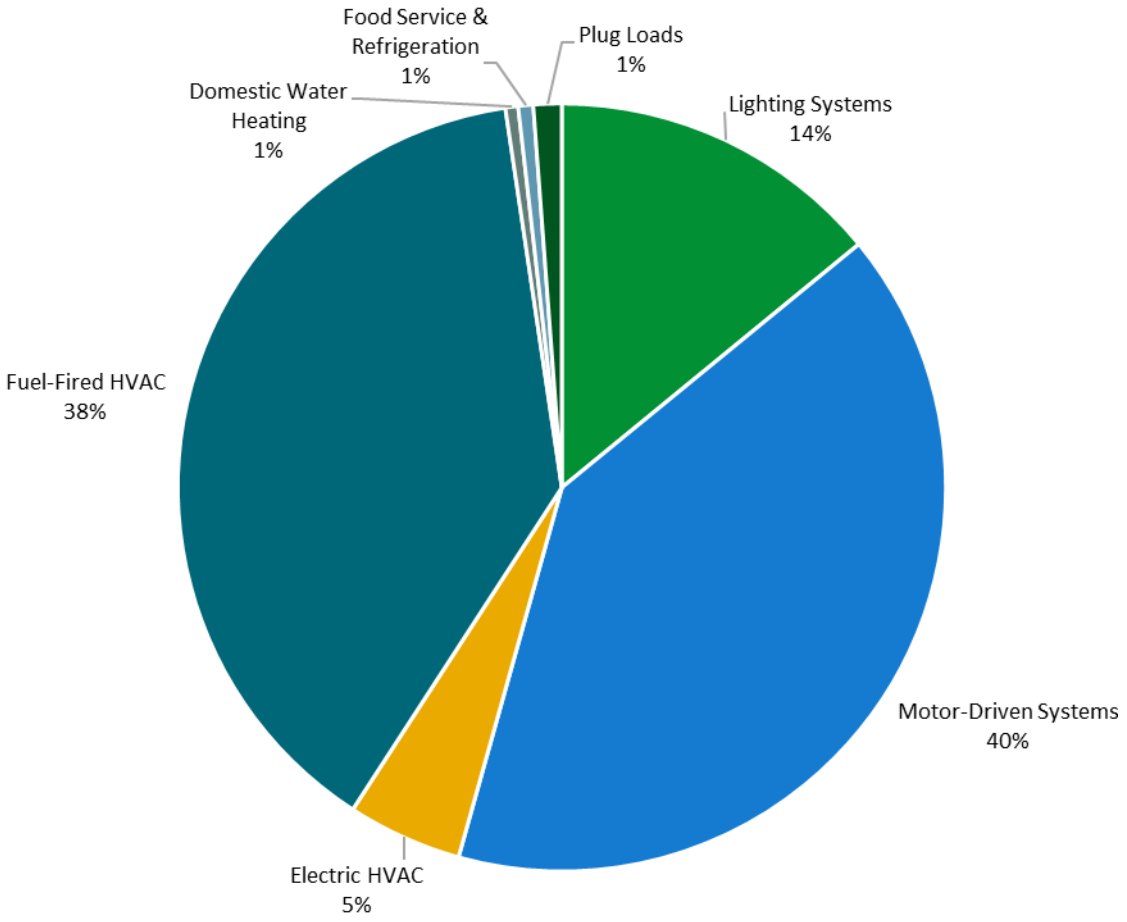
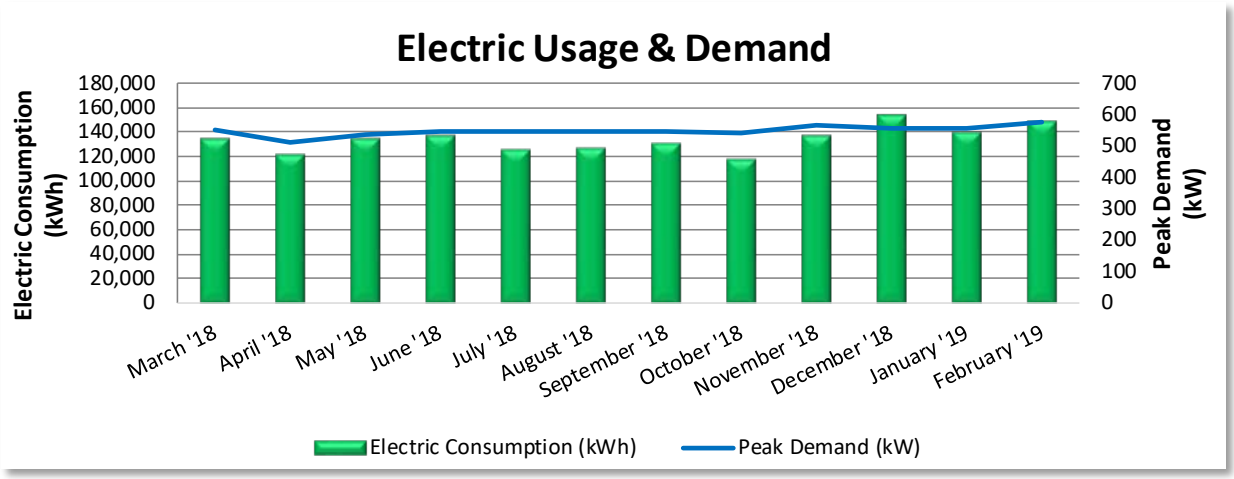


Figure 5 - Energy Balance

3.1 Electricity

PSE&G delivers electricity under rate class LPLS.



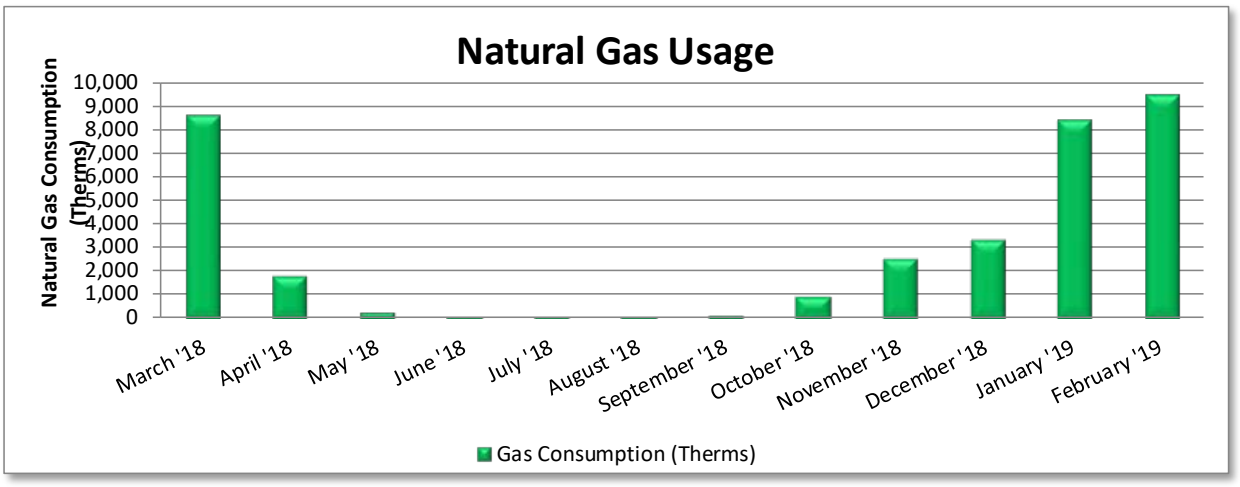
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
4/10/18	30	133,148	551	$2,073	$14,735
5/9/18	31	121,045	510	$1,824	$13,947
6/8/18	30	134,041	535	$6,464	$19,821
7/10/18	31	135,888	548	$6,618	$18,564
8/8/18	31	124,239	545	$6,579	$17,504
9/7/18	30	125,548	545	$6,586	$17,128
10/8/18	31	130,189	547	$1,958	$12,199
11/6/18	30	116,910	540	$1,950	$11,337
12/7/18	31	135,751	565	$2,119	$13,270
1/9/19	31	152,478	554	$2,078	$15,221
2/7/19	28	138,971	557	$2,088	$13,875
3/11/19	31	147,873	574	$2,052	$16,327
Totals	**365**	**1,596,081**	**574**	**$42,389**	**$183,926**
Annual	**365**	**1,596,081**	**574**	**$42,389**	**$183,926**

Notes:

- Peak demand of 574 kW occurred in February '19.
- Average demand over the past 12 months was 548 kW.
- The average electric cost over the past 12 months was $0.115/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.
- The facility electricity use profile is almost constant throughout the year, reflective of the major impact that year-round process loads have on the overall energy use profile.

3.2 Natural Gas

PSE&G delivers natural gas under rate class LVG.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
4/10/18	30	8,575	$5,203
5/9/18	31	1,747	$1,157
6/8/18	30	239	$254
7/10/18	31	23	$121
8/8/18	31	12	$114
9/7/18	30	20	$119
10/8/18	31	109	$175
11/6/18	30	892	$1,859
12/7/18	31	2,476	$3,142
1/9/19	31	3,303	$3,907
2/7/19	28	8,372	$7,537
3/11/19	31	9,431	$8,181
Totals	**365**	**35,200**	**$31,770**
Annual	**365**	**35,200**	**$31,770**

Notes:

- The average gas cost for the past 12 months is $0.903/therm, which is the blended rate used throughout the analysis.
- The gas use profile is typical for a facility with a significant heating load relative to domestic hot water heating system.

3.3 Benchmarking

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

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

Benchmarking Score	**N/A**

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

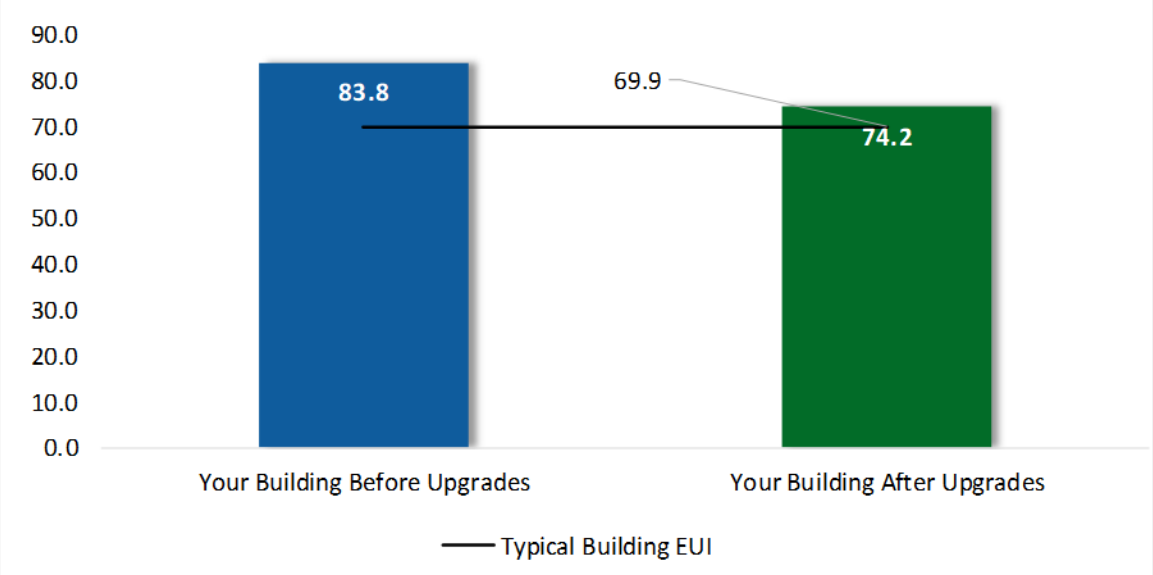


Figure 6 - Energy Use Intensity Comparison[3]

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. 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.

[3] Based on all evaluated ECMs

Tracking Your Energy Performance

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

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

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

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[4].

[4] 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_2e Emissions Reduction (lbs)
Lighting Upgrades			**227,392**	**39.5**	**-36**	**$25,879**	**$77,762**	**$25,974**	**$51,788**	**2.0**	**224,765**
ECM 1	Install LED Fixtures	Yes	57,696	0.0	0	$6,649	$36,271	$8,200	$28,071	4.2	58,099
ECM 2	Retrofit Fixtures with LED Lamps	Yes	169,525	39.5	-36	$19,211	$41,274	$17,774	$23,500	1.2	166,499
ECM 3	Install LED Exit Signs	Yes	170	0.0	0	$19	$217	$0	$217	11.3	167
Lighting Control Measures			**5,667**	**1.0**	**-1**	**$642**	**$4,907**	**$2,010**	**$2,897**	**4.5**	**5,565**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	4,510	0.8	-1	$511	$3,782	$900	$2,882	5.6	4,429
ECM 5	Install High/Low Lighting Controls	Yes	1,157	0.2	0	$131	$1,125	$1,110	$15	0.1	1,136
Motor Upgrades			**6,906**	**3.0**	**0**	**$796**	**$18,786**	**$0**	**$18,786**	**23.6**	**6,954**
ECM 6	Premium Efficiency Motors	No	6,906	3.0	0	$796	$18,786	$0	$18,786	23.6	6,954
Variable Frequency Drive (VFD) Measures			**16,166**	**4.9**	**0**	**$1,863**	**$19,062**	**$2,400**	**$16,662**	**8.9**	**16,279**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	16,166	4.9	0	$1,863	$19,062	$2,400	$16,662	8.9	16,279
Electric Unitary HVAC Measures			**34,762**	**17.4**	**0**	**$4,006**	**$152,916**	**$14,292**	**$138,624**	**34.6**	**35,005**
ECM 8	Install High Efficiency Air Conditioning Units	No	34,762	17.4	0	$4,006	$152,916	$14,292	$138,624	34.6	35,005
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**29**	**$261**	**$28,639**	**$5,600**	**$23,039**	**88.3**	**3,384**
ECM 9	Install High Efficiency Furnaces	No	0	0.0	29	$261	$28,639	$5,600	$23,039	88.3	3,384
Domestic Water Heating Upgrade			**417**	**0.0**	**2**	**$65**	**$50**	**$50**	**$0**	**0.0**	**642**
ECM 10	Install Low-Flow DHW Devices	Yes	417	0.0	2	$65	$50	$50	$0	0.0	642
Food Service & Refrigeration Measures			**10,699**	**1.2**	**0**	**$1,233**	**$2,070**	**$600**	**$1,470**	**1.2**	**10,773**
ECM 11	Vending Machine Control	Yes	10,699	1.2	0	$1,233	$2,070	$600	$1,470	1.2	10,773
TOTALS			**302,008**	**67.0**	**-6**	**$34,744**	**$304,193**	**$50,926**	**$253,267**	**7.3**	**303,368**

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

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

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**227,392**	**39.5**	**-36**	**$25,879**	**$77,762**	**$25,974**	**$51,788**	**2.0**	**224,765**
ECM 1	Install LED Fixtures	57,696	0.0	0	$6,649	$36,271	$8,200	$28,071	4.2	58,099
ECM 2	Retrofit Fixtures with LED Lamps	169,525	39.5	-36	$19,211	$41,274	$17,774	$23,500	1.2	166,499
ECM 3	Install LED Exit Signs	170	0.0	0	$19	$217	$0	$217	11.3	167
Lighting Control Measures		**5,667**	**1.0**	**-1**	**$642**	**$4,907**	**$2,010**	**$2,897**	**4.5**	**5,565**
ECM 4	Install Occupancy Sensor Lighting Controls	4,510	0.8	-1	$511	$3,782	$900	$2,882	5.6	4,429
ECM 5	Install High/Low Lighting Controls	1,157	0.2	0	$131	$1,125	$1,110	$15	0.1	1,136
Variable Frequency Drive (VFD) Measures		**16,166**	**4.9**	**0**	**$1,863**	**$19,062**	**$2,400**	**$16,662**	**8.9**	**16,279**
ECM 7	Install VFDs on Constant Volume (CV) Fans	16,166	4.9	0	$1,863	$19,062	$2,400	$16,662	8.9	16,279
Domestic Water Heating Upgrade		**417**	**0.0**	**2**	**$65**	**$50**	**$50**	**$0**	**0.0**	**642**
ECM 10	Install Low-Flow DHW Devices	417	0.0	2	$65	$50	$50	$0	0.0	642
Food Service & Refrigeration Measures		**10,699**	**1.2**	**0**	**$1,233**	**$2,070**	**$600**	**$1,470**	**1.2**	**10,773**
ECM 11	Vending Machine Control	10,699	1.2	0	$1,233	$2,070	$600	$1,470	1.2	10,773
TOTALS		**260,340**	**46.6**	**-35**	**$29,682**	**$103,852**	**$31,034**	**$72,818**	**2.5**	**258,025**

* - 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_2e Emissions Reduction (lbs)
Lighting Upgrades		**227,392**	**39.5**	**-36**	**$25,879**	**$77,762**	**$25,974**	**$51,788**	**2.0**	**224,765**
ECM 1	Install LED Fixtures	57,696	0.0	0	$6,649	$36,271	$8,200	$28,071	4.2	58,099
ECM 2	Retrofit Fixtures with LED Lamps	169,525	39.5	-36	$19,211	$41,274	$17,774	$23,500	1.2	166,499
ECM 3	Install LED Exit Signs	170	0.0	0	$19	$217	$0	$217	11.3	167

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

ECM 1: Install LED Fixtures

Replace existing fixtures containing HID lamps (metal halide and high pressure sodium) with new LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

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

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

Affected building areas: exterior HID fixtures.

ECM 2: Retrofit Fixtures with LED Lamps

Replace fluorescent T5 and CFL 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 T5 and T8 tubes, CFL lamps in the conference room and the old entrance area.

ECM 3: Install LED Exit Signs

Replace compact fluorescent exit signs with LED exit signs. LED exit signs require virtually no maintenance and have a life expectancy of at least 20 years. This measure saves energy by installing LED fixtures, which use less power than other technologies with an equivalent lighting output. Maintenance savings and improved reliability may also be achieved, as the longer-lasting LED lamps will not need to be replaced as often as the existing 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_2e Emissions Reduction (lbs)
Lighting Control Measures		**5,667**	**1.0**	**-1**	**$642**	**$4,907**	**$2,010**	**$2,897**	**4.5**	**5,565**
ECM 4	Install Occupancy Sensor Lighting Controls	4,510	0.8	-1	$511	$3,782	$900	$2,882	5.6	4,429
ECM 5	Install High/Low Lighting Controls	1,157	0.2	0	$131	$1,125	$1,110	$15	0.1	1,136

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

ECM 4: Install Occupancy Sensor Lighting Controls

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

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

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

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

Affected building areas: offices, conference room, gymnasium, and storage rooms.

ECM 5: Install High/Low Lighting Controls

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

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

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

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

Affected building areas: hallways.

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

4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**6,906**	**3.0**	**0**	**$796**	**$18,786**	**$0**	**$18,786**	**23.6**	**6,954**
ECM 6	Premium Efficiency Motors	6,906	3.0	0	$796	$18,786	$0	$18,786	23.6	6,954

ECM 6: Premium Efficiency Motors

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

Affected motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Fleet maintenance Garage	Fleet maintenance Garage	3	Exhaust Fan	1.5	Exhaust Fan
Production	Baler #2	1	Other	10.0	Process Pump
Production	Baler #2	1	Other	7.5	Process Fan
Production	Baler #2	1	Other	10.0	Process Pump
Production	Baler #1	1	Other	5.0	Process Fan
Production	Baler #1	1	Other	7.5	Process Pump
Production	Floor Pumps - C211,C212,C213	1	Process Pump	5.0	Process Pump
Production	Items # 82, 32, 12, Deck 2	4	Other	10.0	Industrial Motors
Main Compressor Room	Air Compressor	1	Air Compressor	40.0	Air Compressor

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

4.4 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**16,166**	**4.9**	**0**	**$1,863**	**$19,062**	**$2,400**	**$16,662**	**8.9**	**16,279**
ECM 7	Install VFDs on Constant Volume (CV) Fans	16,166	4.9	0	$1,863	$19,062	$2,400	$16,662	8.9	16,279

Variable frequency drives control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new inverter duty rated motor to conservatively account for the cost of an inverter duty rated motor.

ECM 7: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds of the RTUs. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: Lennox RTUs.

4.5 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**34,762**	**17.4**	**0**	**$4,006**	**$152,916**	**$14,292**	**$138,624**	**34.6**	**35,005**
ECM 8	Install High Efficiency Air Conditioning Units	34,762	17.4	0	$4,006	$152,916	$14,292	$138,624	34.6	35,005

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

ECM 8: Install High Efficiency Air Conditioning Units

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

This measure is part of a measure to replace package units at this site and as such must be considered in combination with ECM 9.

Affected units: older and less efficient RTUs and split system ACs.

4.6 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**29**	**$261**	**$28,639**	**$5,600**	**$23,039**	**88.3**	**3,384**
ECM 9	Install High Efficiency Furnaces	0	0.0	29	$261	$28,639	$5,600	$23,039	88.3	3,384

ECM 9: Install High Efficiency Furnaces

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

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

This measure is part of a measure to replace package units at this site and as such must be considered in combination with ECM 8.

Affected units: Lennox and Carrier RTU furnaces.

4.7 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**417**	**0.0**	**2**	**$65**	**$50**	**$50**	**$0**	**0.0**	**642**
ECM 10	Install Low-Flow DHW Devices	417	0.0	2	$65	$50	$50	$0	0.0	642

ECM 10: Install Low-Flow DHW Devices

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

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Showerhead	2.0 gpm

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

4.8 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**10,699**	**1.2**	**0**	**$1,233**	**$2,070**	**$600**	**$1,470**	**1.2**	**10,773**
ECM 11	Vending Machine Control	10,699	1.2	0	$1,233	$2,070	$600	$1,470	1.2	10,773

ECM 11: Vending Machine Control

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

5 ENERGY EFFICIENT BEST PRACTICES

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs. You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[5] . Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Lighting Maintenance

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

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

Lighting Controls

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

Motor Controls

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Whenever possible, use automatic devices such as twist timers or occupancy sensors to turn off motors when they are not needed.

Motor Short Cycling Reduction

Frequent stopping and starting of motors places substantial stress on rotors and other parts. This leads to wear and tear, lower efficiency, and higher maintenance costs. Adjust the load on the motor to limit the amount of unnecessary stopping and starting to improve motor performance.

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

Motor Maintenance

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

Thermostat Schedules and Temperature Resets

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

Furnace Maintenance

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

Water Heater Maintenance

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

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

Compressed Air System Maintenance

Compressed air systems require periodic maintenance to operate at peak efficiency. A maintenance plan for compressed air systems should include:

- Inspection, cleaning, and replacement of inlet filter cartridges
- Cleaning of drain traps
- Daily inspection of lubricant levels to reduce unwanted friction
- Inspection of belt condition and tension
- Check for leaks and adjust loose connections
- Overall system cleaning

Contact a qualified technician for help with setting up periodic maintenance schedule.

Water Conservation

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

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

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

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

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

Procurement Strategies

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

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

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

6 On-site Generation

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

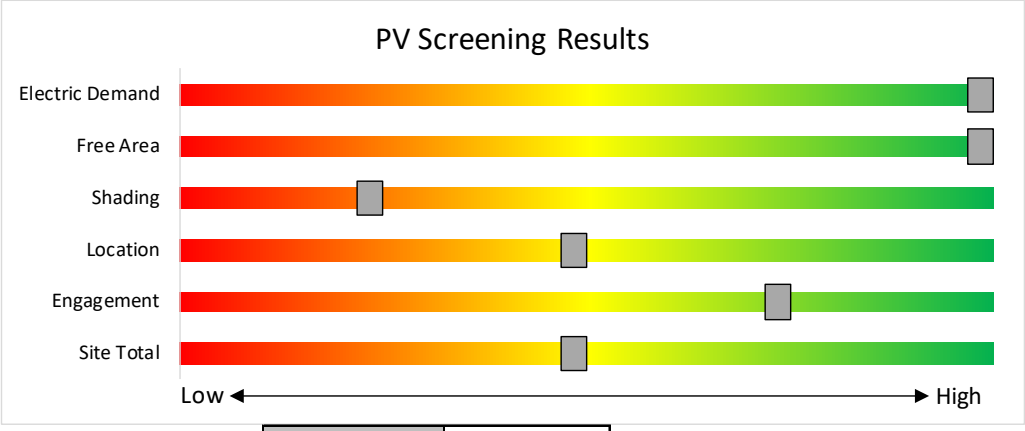
6.1 Solar Photovoltaic

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 medium potential for installing a PV array.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the medium potential. A PV array located on the ground may be feasible, but the large roof free space cannot handle solar PV arrays as its structure is not strong enough. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

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



Potential	Medium	
System Potential	161	kW DC STC
Electric Generation	121,144	kWh/yr
Displaced Cost	$13,960	/yr
Installed Cost	$460,500	

Figure 9 - Photovoltaic Screening

Solar Renewable Energy Certificate (SREC) Registration Program (SRP)

Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SREC Registration Program before starting construction. Once your PV system is up and running, you periodically earn credits, which can then be sold on the open market for up to 15 years.

If you are considering installing solar photovoltaics on your building, visit www.njcleanenergy.com/srec for more information about the SREC Registration Program.

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:

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

6.2 Combined Heat and Power

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

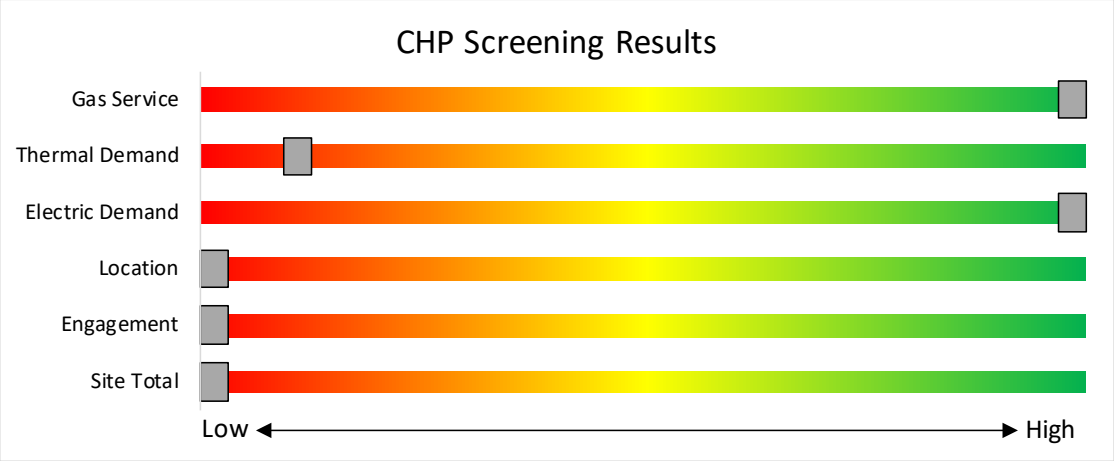
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be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

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

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

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



Potential	None	
System Type	None	
System Potential	0	kW
Electric Generation	0	kWh/yr
Thermal Generation	0	MBtu/yr
Displaced Cost	$0	/yr
Installed Cost	$0	

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/.

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 in New Jersey's Clean Energy Programs.

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

7.1 SmartStart

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

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy 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 for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

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

Incentives

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

How to Participate

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

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

7.3 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.

The scope of work presented in this audit report does not quite meet the requirements of the current P4P program. However, due to the size of the facility and existing conditions, should additional measures be identified at a later point in time, for example through further evaluation or the Energy Savings Improvement Program process, this facility could potentially meet the requirements necessary to participate in the 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.

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

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

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

How to Participate

You 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.

7.5 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) 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 SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

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 SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SREC's to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar Renewable Portfolio Standard. Purchasing SRECs can help them meet those requirements. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period fluctuates depending on supply and demand.

Information about the SRP can be found at: www.njcleanenergy.com/srec.

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

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

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

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

8.2 Retail Natural Gas Supply Options

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

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

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

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

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

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

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Fleet Maintenance	35	Linear Fluorescent - T5HO: 4' T5HO (54W) - 4L	Wall Switch	S	234	4,550	2	Relamp	No	35	LED - Linear Tubes: (4) 4' T5HO (25W) Lamps	Wall Switch	102	4,550	4.1	22,703	-5	$2,573	$3,695	$1,400	0.9
Fleet Maintenance	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Office	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Occupancy Sensor	S	53	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,140	0.0	186	0	$21	$98	$36	2.9
Compressor Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,140	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,140	0.0	112	0	$13	$37	$20	1.3
Production	185	Linear Fluorescent - T5HO: 4' T5HO (54W) - 4L	Occupancy Sensor	S	234	3,140	2	Relamp	No	185	LED - Linear Tubes: (4) 4' T5HO (25W) Lamps	Occupancy Sensor	102	3,140	21.6	82,800	-18	$9,382	$19,533	$7,400	1.3
Production	10	Linear Fluorescent - T5HO: 4' T5HO (54W) - 2L	Occupancy Sensor	S	117	3,140	2	Relamp	No	10	LED - Linear Tubes: (2) 4' T5HO (25W) Lamps	Occupancy Sensor	51	3,140	0.6	2,238	0	$254	$571	$200	1.5
Production	5	Linear Fluorescent - T5HO: 4' T5HO (54W) - 6L	Occupancy Sensor	S	358	3,140	2	Relamp	No	5	LED - Linear Tubes: (6) 4' T5HO (25W) Lamps	Occupancy Sensor	153	3,140	0.9	3,475	-1	$394	$621	$300	0.8
Production	12	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	12	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Scal House Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,550	0.1	486	0	$55	$110	$60	0.9
Scal House Hallway	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
Scal House Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.3	1,857	0	$210	$599	$250	1.7
Scal House 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
Men Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Women Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,550	2	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,550	0.0	79	0	$9	$33	$12	2.3
Gym	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,550	2, 4	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,140	0.7	3,714	-1	$421	$1,197	$500	1.7
Gym	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
Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,140	0.1	348	0	$39	$214	$36	4.5
2nd Floor Hallway	11	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,550	2, 5	Relamp	Yes	11	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	3,140	0.3	1,914	0	$217	$986	$648	1.6
2nd Floor Hallway	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
Room 216	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 217	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 206	1	Exit Signs: Fluorescent	None		12	8,760	3	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.0	57	0	$6	$72	$0	11.3
Room 206	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.3	1,007	0	$114	$329	$180	1.3
Room 207	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,550	0.0	243	0	$28	$55	$30	0.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 208	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	504	0	$57	$164	$90	1.3
Room 209	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 210	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 211	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 212	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 213	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 214	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 206A	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.3	1,175	0	$133	$383	$210	1.3
Room 205	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Men Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.0	168	0	$19	$55	$30	1.3
Women Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.0	168	0	$19	$55	$30	1.3
Room 204	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 202	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 200	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 201	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 203	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	619	0	$70	$226	$100	1.8
Stairwell	4	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,550	2, 5	Relamp	Yes	4	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	3,140	0.1	696	0	$79	$420	$297	1.6
Reception	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
Reception	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,140	0.1	348	0	$39	$98	$36	1.6
Reception	8	LED Lamps: Screw in	Wall Switch	S	9	4,550	4	None	Yes	8	LED Lamps: Screw in	Occupancy Sensor	9	3,140	0.0	110	0	$12	$270	$70	16.1
1st Floor Hallway	8	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Occupancy Sensor	S	53	3,140	2	Relamp	No	8	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,140	0.2	746	0	$85	$390	$144	2.9
1st Floor Hallway	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
Conference Room	11	LED Lamps: Screw in	Wall Switch	S	9	4,550	4	None	Yes	11	LED Lamps: Screw in	Occupancy Sensor	9	3,140	0.0	151	0	$17	$270	$70	11.7
Conference Room	11	Compact Fluorescent: Screw in	Wall Switch	S	23	4,550	2, 4	Relamp	Yes	11	LED Lamps: Plug in Lamp	Occupancy Sensor	16	3,140	0.1	643	0	$73	$459	$92	5.0
Men Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Occupancy Sensor	S	53	3,140	2	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,140	0.0	93	0	$11	$49	$18	2.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Hallway	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,550	2	Relamp	No	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,550	0.0	270	0	$31	$98	$36	2.0
Hallway	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
Women Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	619	0	$70	$380	$130	3.6
Men Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	619	0	$70	$380	$130	3.6
Alarm Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,140	0.1	413	0	$47	$189	$80	2.3
Room 100	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	504	0	$57	$164	$90	1.3
Room 100A	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.0	168	0	$19	$55	$30	1.3
Room 100B	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.0	168	0	$19	$55	$30	1.3
Room 101	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,140	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,140	0.1	217	0	$25	$130	$48	3.3
Room 103	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,140	2	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,140	0.1	217	0	$25	$130	$48	3.3
Room 102	7	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,140	2	Relamp	No	7	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,140	0.1	380	0	$43	$228	$84	3.3
Room 102	1	Exit Signs: Fluorescent	None		12	8,760	3	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.0	57	0	$6	$72	$0	11.3
Conference Room	1	Exit Signs: Fluorescent	None		12	8,760	3	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.0	57	0	$6	$72	$0	11.3
Room 104	4	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Occupancy Sensor	S	53	3,140	2	Relamp	No	4	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,140	0.1	373	0	$42	$195	$72	2.9
Room 105	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.2	671	0	$76	$219	$120	1.3
Room 107	4	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Occupancy Sensor	S	53	3,140	2	Relamp	No	4	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,140	0.1	373	0	$42	$195	$72	2.9
Room 109	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.2	671	0	$76	$219	$120	1.3
Old Entrance	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
Old Entrance	5	Compact Fluorescent: Screw in	Wall Switch	S	14	4,550	2	Relamp	No	5	LED Lamps: Plug in Lamp	Wall Switch	10	4,550	0.0	103	0	$12	$86	$10	6.5
Old Entrance	5	LED Lamps: Screw in	Wall Switch	S	9	4,550		None	No	5	LED Lamps: Screw in	Wall Switch	9	4,550	0.0	0	0	$0	$0	$0	0.0
Maintenance Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.2	839	0	$95	$274	$150	1.3
Maintenance Hallway	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 0	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	619	0	$70	$226	$100	1.8
Room 4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 5	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 6	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 7	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 9	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	619	0	$70	$226	$100	1.8
Hallway	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,140	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,140	0.4	1,566	0	$178	$511	$280	1.3
Hallway	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
Janitorial	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,140	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,140	0.1	224	0	$25	$73	$40	1.3
Nurse Station	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	619	0	$70	$226	$100	1.8
Nurse Station	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,550	2	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,550	0.0	135	0	$15	$49	$18	2.0
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Occupancy Sensor	S	53	3,140	2	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,140	0.0	93	0	$11	$49	$18	2.9
Room 2B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Room 2C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,550	0.1	486	0	$55	$110	$60	0.9
Hallway	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
Operator Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	336	0	$38	$110	$60	1.3
Cafeteria	33	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	33	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	1.4	5,539	-1	$628	$1,807	$990	1.3
Collection Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 5	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	3,140	0.3	1,548	0	$175	$499	$375	0.7
Collection Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,550	2, 5	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,140	0.0	206	0	$23	$37	$20	0.7
Collection Hallway	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
Room 5	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.2	671	0	$76	$219	$120	1.3
Women Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	504	0	$57	$164	$90	1.3
Men Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	504	0	$57	$164	$90	1.3
Safety Hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 5	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	3,140	0.2	929	0	$105	$389	$300	0.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Safety Hallway	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
Room 6	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	504	0	$57	$164	$90	1.3
Room 7	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.1	504	0	$57	$164	$90	1.3
Room 8	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.4	1,511	0	$171	$493	$270	1.3
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.2	671	0	$76	$219	$120	1.3
Fleet Maintenance Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	3,140	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.3	1,007	0	$114	$329	$180	1.3
Glass Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	None	S	114	8,760	2	Relamp	No	11	LED - Linear Tubes: (4) 4' Lamps	None	58	8,760	0.5	5,828	-1	$660	$803	$440	0.6
Storage Room GC3	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.2	929	0	$105	$280	$90	1.8
Storage Room GC3	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
Storage Room GC2	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,550	0.0	243	0	$28	$55	$30	0.9
Storage Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.4	2,476	-1	$281	$708	$240	1.7
Main Conference Room	4	Linear Fluorescent - T5HO: 4' T5HO (54W) - 4L	Wall Switch	S	234	4,550	2, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' T5HO (25W) Lamps	Occupancy Sensor	102	3,140	0.6	3,216	-1	$364	$692	$230	1.3
Clean Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,550	2, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,140	0.3	1,857	0	$210	$599	$250	1.7
Exterior Wall Pack	10	Metal Halide: (1) 320W Lamp	Photocell		365	4,380	1	Fixture Replacement	No	10	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	110	4,380	0.0	11,191	0	$1,290	$9,660	$2,000	5.9
Exterior Wall Pack	11	Compact Fluorescent: (1) 42W Plug-In Lamp	Photocell		42	4,380	2	Relamp	No	11	LED Lamps: Plug in Lamp	Photocell	29	4,380	0.0	607	0	$70	$277	$44	3.3
Exterior Wall Pack	4	Metal Halide: (1) 1000W Lamp	Photocell		1,080	4,380	1	Fixture Replacement	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	324	4,380	0.0	13,245	0	$1,526	$3,864	$800	2.0
Exterior Wall Pack	3	Metal Halide: (1) 250W Lamp	Photocell		295	4,380	1	Fixture Replacement	No	3	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	89	4,380	0.0	2,713	0	$313	$2,898	$600	7.3
Exterior Pole Light	6	High-Pressure Sodium: (1) 250W Lamp	Photocell		295	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell	89	4,380	0.0	5,427	0	$625	$5,583	$1,200	7.0
Exterior Pole Light	4	Metal Halide: (1) 1000W Lamp	Photocell		1,080	4,380	1	Fixture Replacement	No	4	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell	324	4,380	0.0	13,245	0	$1,526	$3,722	$800	1.9
Exterior Pole Light	8	Metal Halide: (1) 250W Lamp	Photocell		295	4,380	1	Fixture Replacement	No	8	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell	89	4,380	0.0	7,236	0	$834	$7,445	$1,600	7.0
Exterior Ground Floor	1	Metal Halide: (1) 400W Lamp	Photocell		458	4,380	1	Fixture Replacement	No	1	LED - Fixtures: High-Bay	Photocell	137	4,380	0.0	1,404	0	$162	$775	$300	2.9
Exterior Ground Floor	2	Metal Halide: (1) 250W Lamp	Photocell		295	4,380	1	Fixture Replacement	No	2	LED - Fixtures: High-Bay	Photocell	89	4,380	0.0	1,809	0	$208	$1,550	$600	4.6
Exterior Ground Floor	1	High-Pressure Sodium: (1) 400W Lamp	Photocell		465	4,380	1	Fixture Replacement	No	1	LED - Fixtures: High-Bay	Photocell	140	4,380	0.0	1,426	0	$164	$775	$300	2.9

Motor Inventory & Recommendations

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Fleet maintenance Garage	Fleet maintenance Garage	1	Supply Fan	10.0	89.5%	No	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Fleet maintenance Garage	Fleet maintenance Garage	3	Supply Fan	0.3	71.0%	No	W	2,745		No	71.0%	No		0.0	0	0	$0	$0	$0	0.0
Production	Production	5	Supply Fan	0.8	72.0%	No	W	2,745		No	72.0%	No		0.0	0	0	$0	$0	$0	0.0
Production	Production	2	Supply Fan	0.3	71.0%	No	W	2,745		No	71.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Various Spaces	5	Supply Fan	3.0	82.0%	No	B	2,745	7	No	89.5%	Yes	5	4.9	16,166	0	$1,863	$19,062	$2,400	8.9
Ground Floor	Various Split System Acs	13	Supply Fan	0.3	71.0%	No	B	2,745		No	71.0%	No		0.0	0	0	$0	$0	$0	0.0
Fleet maintenance Garage	Fleet maintenance Garage	3	Exhaust Fan	1.5	82.0%	No	W	2,745	6	Yes	86.5%	No		0.1	438	0	$51	$2,243	$0	44.4
Compressor Room	Air Compressor (Fleet Maintenance)	1	Air Compressor	7.5	88.5%	No	W	1,000		No	88.5%	No		0.0	0	0	$0	$0	$0	0.0
Fleet maintenance Garage	Fleet maintenance Garage	2	Other	0.3	71.0%	No	W	2,745		No	71.0%	No		0.0	0	0	$0	$0	$0	0.0
Production	Production	3	Other	1.0	71.0%	No	W	50		No	71.0%	No		0.0	0	0	$0	$0	$0	0.0
Production	Production	4	Other	0.8	71.0%	No	W	1,690		No	71.0%	No		0.0	0	0	$0	$0	$0	0.0
Production	Production	1	Process Blower	10.0	90.2%	No	W	1,690		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
Production	Baler #2	2	Other	100.0	95.4%	No	W	1,690		No	95.4%	No		0.0	0	0	$0	$0	$0	0.0
Production	Baler #2	1	Other	10.0	89.5%	No	B	1,690	6	Yes	91.7%	No		0.1	253	0	$29	$1,567	$0	53.7
Production	Baler #2	1	Other	7.5	86.7%	No	B	1,690	6	Yes	91.7%	No		0.2	446	0	$51	$1,154	$0	22.4
Production	Baler #2	1	Other	10.0	91.7%	No	B	1,690	6	Yes	91.7%	No		0.0	0	0	$0	$1,567	$0	0.0
Production	Baler #1	1	Other	150.0	95.0%	No	W	1,690		No	95.0%	No		0.0	0	0	$0	$0	$0	0.0
Production	Baler #1	1	Other	5.0	84.5%	No	W	1,690	6	Yes	89.5%	No		0.1	313	0	$36	$921	$0	25.6
Production	Baler #1	1	Other	7.5	87.5%	No	B	1,690	6	Yes	91.7%	No		0.2	371	0	$43	$1,154	$0	27.0
Production	Floor Pumps - C211,C212,C213	3	Process Pump	30.0	93.6%	No	W	1,690		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Office	Office	1	Packaged Terminal HP	1.23	12.00	W		No							0.0	0	0	$0	$0	$0	0.0
Room 2003	Room 203	1	Window AC	0.75		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Fleet Maintenance Unit #18	1	Packaged AC	10.00		W	8	Yes	1	Packaged AC	10.00		12.00		1.7	3,333	0	$384	$17,821	$1,460	42.6
Roof	Fleet Maintenance Unit #11	1	Packaged AC	10.00		B	8	Yes	1	Packaged AC	10.00		12.00		1.7	3,333	0	$384	$17,821	$1,460	42.6
Roof	Plant Unit #13	1	Packaged AC	10.00		B	8	Yes	1	Packaged AC	10.00		12.00		1.7	3,333	0	$384	$17,821	$1,460	42.6
Roof	Plant Unit #17	1	Packaged AC	10.00		W	8	Yes	1	Packaged AC	10.00		12.00		1.7	3,333	0	$384	$17,821	$1,460	42.6
Roof	Plant Unit #14	1	Packaged AC	10.00		B	8	Yes	1	Packaged AC	10.00		12.00		1.7	3,333	0	$384	$17,821	$1,460	42.6
Roof	Plant Unit #15	1	Packaged AC	5.00		B	8	Yes	1	Packaged AC	5.00		14.00		1.2	2,381	0	$274	$11,345	$920	38.0
Roof	Plant Unit #16	1	Packaged AC	4.00		B	8	Yes	1	Packaged AC	4.00		14.00		1.0	1,905	0	$219	$9,076	$736	38.0
Ground Floor	Main Office Unit #11	1	Split-System AC	3.00		W		No							0.0	0	0	$0	$0	$0	0.0
Ground Floor	Offices Unit #8	1	Split-System AC	3.00		W	8	Yes	1	Split-System AC	3.00		14.00		0.7	1,429	0	$165	$4,489	$552	23.9
Ground Floor	Training Room Unit #9	1	Split-System AC	3.00		W	8	Yes	1	Split-System AC	3.00		14.00		0.7	1,429	0	$165	$4,489	$552	23.9
Ground Floor	Second Floor Offices Unit #10	1	Split-System AC	3.00		W		No							0.0	0	0	$0	$0	$0	0.0
Ground Floor	Server Room Unit 19	1	Split-System AC	1.50		B	8	Yes	1	Split-System AC	1.50		14.00		0.4	714	0	$82	$2,244	$276	23.9
Ground Floor	1st Floor Offices Unit #7	1	Split-System AC	3.00		W	8	Yes	1	Split-System AC	3.00		14.00		0.7	1,429	0	$165	$4,489	$552	23.9
Ground Floor	2nd Floor Offices Unit #6	1	Split-System AC	3.00		W	8	Yes	1	Split-System AC	3.00		14.00		0.7	1,429	0	$165	$4,489	$552	23.9
Ground Floor	2nd Floor Offices Unit #5	1	Split-System AC	3.00		B	8	Yes	1	Split-System AC	3.00		14.00		0.7	1,429	0	$165	$4,489	$552	23.9
Ground Floor	Cafeteria Unit #4	1	Split-System AC	3.00		W	8	Yes	1	Split-System AC	3.00		14.00		0.7	1,429	0	$165	$4,489	$552	23.9
Ground Floor	1st Floor Offices Unit #2	1	Split-System AC	1.50		W	8	Yes	1	Split-System AC	1.50		14.00		0.4	714	0	$82	$2,244	$276	23.9
Ground Floor	cafeteria Unit #3	1	Split-System AC	3.00		W	8	Yes	1	Split-System AC	3.00		14.00		0.7	1,429	0	$165	$4,489	$552	23.9

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Ground Floor	1st Floor Offices Unit #1	1	Split-System AC	5.00		W	8	Yes	1	Split-System AC	5.00		14.00		1.2	2,381	0	$274	$7,481	$920	23.9

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Fleet maintenance Garage	Fleet Maintenance Garage	1	Furnace	886.40	W		No						0.0	0	0	$0	$0	$0	0.0
Fleet maintenance Garage	Fleet Maintenance Garage	3	Warm Air Unit Heater	87.15	W		No						0.0	0	0	$0	$0	$0	0.0
Production	Production	5	Warm Air Unit Heater	182.30	W		No						0.0	0	0	$0	$0	$0	0.0
Production	Production	2	Warm Air Unit Heater	60.00	W		No						0.0	0	0	$0	$0	$0	0.0
Closet	2nd Floor Office Unit #6	1	Furnace	112.00	W		No						0.0	0	0	$0	$0	$0	0.0
Closet	2nd Floor Office Unit #7	1	Furnace	56.00	W		No						0.0	0	0	$0	$0	$0	0.0
Closet	Server Room Unit #4	1	Infrared Unit Heater	49.13	W		No						0.0	0	0	$0	$0	$0	0.0
Closet	Main Office Unit #11	1	Furnace	96.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	Fleet Maintenance Unit #18	1	Furnace	216.00	B	9	Yes	1	Furnace	216.00	82.00%	AFUE	0.0	0	5	$45	$4,894	$800	91.8
Roof	Main Office Unit #11	1	Furnace	216.00	B	9	Yes	1	Furnace	216.00	82.00%	AFUE	0.0	0	5	$45	$4,894	$800	91.8
Roof	Plant Unit #13	1	Furnace	216.00	B	9	Yes	1	Furnace	216.00	82.00%	AFUE	0.0	0	5	$45	$4,894	$800	91.8
Roof	Plant Unit #17	1	Furnace	216.00	B	9	Yes	1	Furnace	216.00	82.00%	AFUE	0.0	0	5	$45	$4,894	$800	91.8
Roof	Plant Unit #14	1	Furnace	216.00	B	9	Yes	1	Furnace	216.00	82.00%	AFUE	0.0	0	5	$45	$4,894	$800	91.8
Roof	Plant Unit #15	1	Furnace	92.00	B	9	Yes	1	Furnace	92.00	82.00%	AFUE	0.0	0	2	$19	$2,084	$800	67.7
Roof	Plant Unit #16	1	Furnace	92.00	B	9	Yes	1	Furnace	92.00	82.00%	AFUE	0.0	0	2	$19	$2,084	$800	67.7

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	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
Janitorial Closet	Facility	1	Storage Tank Water Heater (≤ 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Closet	Restroom	1	Storage Tank Water Heater (≤ 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Closet	Cafeteria	1	Storage Tank Water Heater (≤ 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Mezzanine	Facility	1	Storage Tank Water Heater (≤ 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Facility	10	4	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	2	$17	$29	$29	0.0
Facility	10	3	Faucet Aerator (Lavatory)	2.20	0.50	0.0	417	0	$48	$22	$22	0.0

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	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
Cafeteria	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	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
Cafeteria	2	Ice Making Head (≥450 lbs/day), Batch	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Recycling Facility	3	Copy Machine	600.0	Yes
Recycling Facility	15	Desktop Computer	120.0	Yes
Recycling Facility	3	Small Refrigerator	46.0	Yes
Recycling Facility	2	Toaster	500.0	No
Recycling Facility	4	Microwave	1,000.0	No
Recycling Facility	4	Water Cooler	92.0	Yes
Recycling Facility	4	Coffee Machine	600.0	No
Recycling Facility	5	Refrigerator	240.0	Yes
Recycling Facility	1	Washing Machine	1,200.0	No
Recycling Facility	1	Electric Range	1,200.0	No
Recycling Facility	2	Desktop Printer	65.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Cafeteria	6	Refrigerated	11	Yes	1.1	9,671	0	$1,114	$1,380	$600	0.7
Cafeteria	3	Non-Refrigerated	11	Yes	0.1	1,028	0	$118	$690	$0	5.8

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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

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ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

Robert C. Shinn Jr. Recycling Center

Primary Property Type: Other
Gross Floor Area (ft²): 107,000
Built: 1985

For Year Ending: February 28, 2019
Date Generated: November 12, 2019

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Robert C. Shinn Jr. Recycling Center 130 Hancock lane Mt Holly, New Jersey 08060	OTC Recycling 130 Hancock Lane MT. Holly, NJ 08043 (____)____-_____	Timothy Whelihan 130 Hancock Lane MT. Holly, NJ 08043 609 267 6665 EXT 149 twhelihan@otcbc.org

Property ID: 7784015

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
82 kBtu/ft²

Source EUI
174.4 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	5,399,169 (62%)
Natural Gas (kBtu)	3,371,064 (38%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	42
National Median Source EUI (kBtu/ft²)	89.3
% Diff from National Median Source EUI	95%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	726

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

Timothy Whelihan
130 Hancock Lane
MT. Holly, NJ 08043
609 267 6665 EXT 149
twhelihan@otcbc.org

Professional Engineer Stamp
(if applicable)

APPENDIX C: GLOSSARY

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

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

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