Local Government Energy Audit Report

Jefferson Elementary School

April 19, 2019

Prepared for:

Township of Union Public Schools
155 Hilton Avenue
Vauxhall, NJ 07088

Prepared by:

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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 Energy Services (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. 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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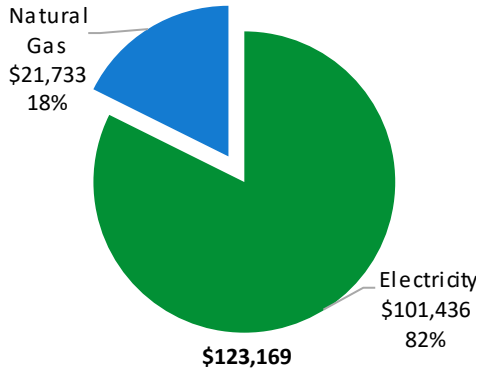
1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Jefferson Elementary School. 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 Energy Services (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 help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $123,169 Electricity: 694,084 kWh Natural Gas: 20,599 Therms	
ENERGY STAR® Benchmarking Score	55 *(1-100 scale)*	This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

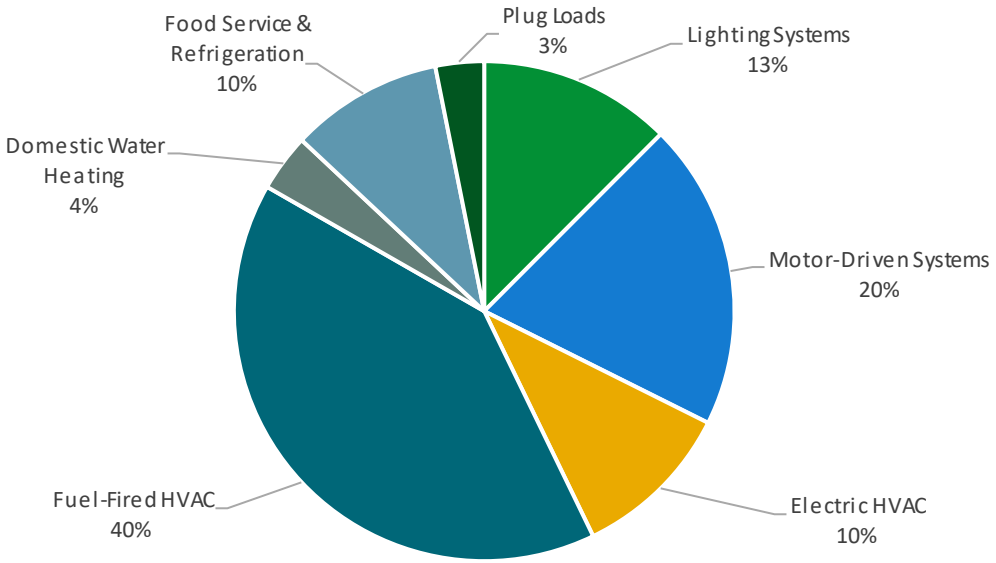


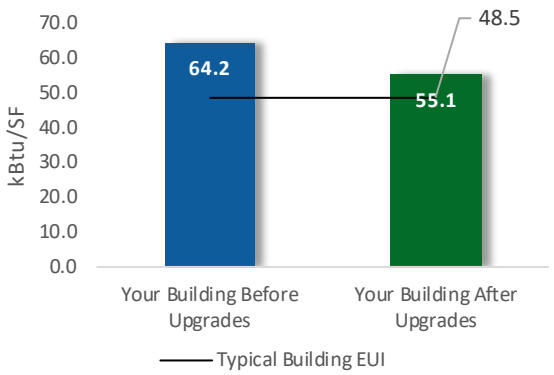
Figure 1 - Energy Use by System

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.

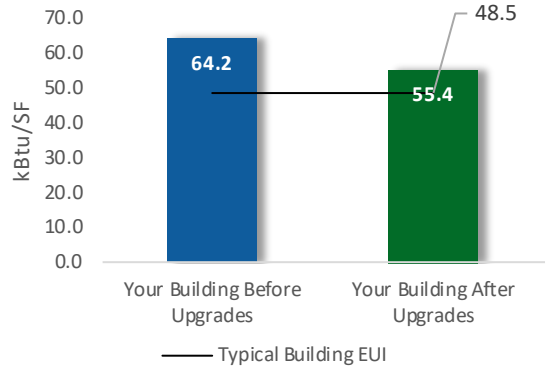
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$162,081
Potential Rebates & Incentives[1]	$19,219
Annual Cost Savings	$27,011
Annual Energy Savings	Electricity: 185,219 kWh
Greenhouse Gas Emission Savings	93 Tons
Simple Payback	5.3 Years
Site Energy Savings (all utilities)	14%



Scenario 2: Cost Effective Package[2]

Installation Cost	$125,110
Potential Rebates & Incentives	$19,219
Annual Cost Savings	$26,712
Annual Energy Savings	Electricity: 183,930 kWh
Greenhouse Gas Emission Savings	92 Tons
Simple Payback	4.0 Years
Site Energy Savings (all utilities)	14%



On-site Generation Potential

Photovoltaic	High
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	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Lifetime Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**83,912**	**24.1**	**-16**	**$12,095**	**$181,431**	**$47,322**	**$9,949**	**$37,373**	**3.1**	**82,637**
ECM 1	Install LED Fixtures	5,427	0.6	0	$793	$11,896	$5,796	$600	$5,196	6.6	5,465
ECM 2	Retrofit Fixtures with LED Lamps	78,485	23.5	-16	$11,302	$169,534	$41,526	$9,349	$32,177	2.8	77,172
Lighting Control Measures		**354**	**0.1**	**0**	**$51**	**$407**	**$540**	**$70**	**$470**	**9.2**	**347**
ECM 3	Install Occupancy Sensor Lighting Controls	354	0.1	0	$51	$407	$540	$70	$470	9.2	347
Motor Upgrades		**348**	**0.1**	**0**	**$51**	**$763**	**$23,376**	**$0**	**$23,376**	**459.8**	**350**
	Premium Efficiency Motors	348	0.1	0	$51	$763	$23,376	$0	$23,376	459.8	350
Variable Frequency Drive (VFD) Measures		**98,053**	**33.4**	**0**	**$14,330**	**$214,948**	**$77,018**	**$9,200**	**$67,818**	**4.7**	**98,739**
ECM 4	Install VFDs on Constant Volume (CV) Fans	98,053	33.4	0	$14,330	$214,948	$77,018	$9,200	$67,818	4.7	98,739
HVAC System Improvements		**942**	**0.0**	**11**	**$249**	**$3,728**	**$13,594**	**$0**	**$13,594**	**54.7**	**2,179**
	Implement Demand Control Ventilation (DCV)	942	0.0	11	$249	$3,728	$13,594	$0	$13,594	54.7	2,179
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$236**	**$1,178**	**$230**	**$0**	**$230**	**1.0**	**1,623**
ECM 5	Vending Machine Control	1,612	0.2	0	$236	$1,178	$230	$0	$230	1.0	1,623
TOTALS		**185,219**	**57.9**	**-5**	**$27,011**	**$402,453**	**$162,081**	**$19,219**	**$142,862**	**5.3**	**185,875**

* - 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

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		x
ECM 2	Retrofit Fixtures with LED Lamps	x		x
ECM 3	Install Occupancy Sensor Lighting Controls	x		x
ECM 4	Install VFDs on Constant Volume (CV) HVAC			x
ECM 5	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 their 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 Jefferson Elementary School. 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 Energy Services (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 October 19, 2018, TRC performed an energy audit at Jefferson Elementary School located in Vauxhall, NJ. TRC met with Robert A. Stapleton to review the facility operations and help focus our investigation on specific energy-using systems.

Jefferson Elementary School is a three-story, 68,940 square foot building built in 1924. Spaces include: classrooms, gymnasium, auditorium, offices, cafeteria, corridors, stairwells, offices, a kitchen, and basement mechanical space.

2.2 Building Occupancy

The building is in operation 10 months out of the year. General operation is 7:00 AM to 10:00 PM Monday through Friday. The school is cleaned after hours between 6:30 PM and 10:00 PM. The building is occupied by 536 students and about 95 staff. The typical schedule is presented in the table below.

Building Name	Weekday/Weekend	Operating Schedule
Jefferson Elementary School	Weekday	7:00 AM - 10:00 PM
	Weekend	No Operation

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a brick facade. The roof is mainly flat. One portion of the roof has gravel layering and the other part has a rubber roof with asphalt layering. There are a few pitched portions with metal cladding. The roofs were observed to be in good condition. The school has fixed windows with vinyl frames and double glazing. They are in good condition. Exterior doors have aluminum frames and are in good condition with undamaged door seals.

Building Envelope

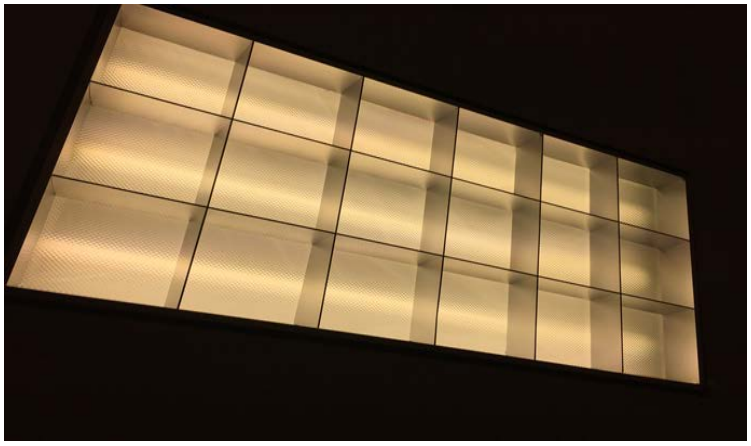
2.4 Lighting Systems

In classrooms, offices, most hallways, and restrooms, the interior lighting system uses primarily 32-Watt linear fluorescent T8 lamps and some compact fluorescent lamps (CFL - 40-Watt, 32-Watt, 26-Watt or 13-Watt) fixtures. The auditorium is lit using 2-foot linear T5 lamp fixtures. Typically, T8 and T5 fluorescent lamps use electronic ballasts.

Linear fluorescent fixture types include 2- 3- or 4-lamp, 2- or 4-foot long troffers while the compact fluorescent lamp fixtures are either recessed or surface mounted, pin-based fixture. There are also some 2-foot fixtures with U-bend tube lamps in the first-floor hallways. Most of the fixtures are in good condition and the spaces are sufficiently lit.

The lighting fixtures in the spaces are controlled using occupant sensors and wall switches. The exit lights at the facility are all 2-Watt LED fixtures.

Surface mounted and recessed exterior lighting fixtures have 26-Watt compact fluorescent lamps. Wall packs include 155-Watt, 120-Watt and 9-Watt LED fixtures and some 250-Watt metal halide fixtures. All of the exterior lights are on time clocks.






Typical Interior Lights & Occupancy Sensors



Exterior Lights

2.5 Air Handling Systems

Unit Ventilators

Unit Ventilator

The facility has nineteen unit ventilators with supply fan motors, pneumatically controlled outside air dampers, and fan coil valves that operate with a pneumatic control system to provide heat. This system is original to the building and appears to be in fair operating condition.

Air is exhausted in various areas with roof mounted exhaust fans.

Packaged Units

Building areas including the gymnasium, cafeteria, faculty lounge, kitchen, music room, storage room, auditorium, and hallways are served with AAON packaged units equipped with DX cooling coils and gas-fired furnaces, all controlled by the building energy management system (EMS). These units have EER values that range from 12.7 to 13 with cooling capacities ranging from 4-ton to 20-tons and heating capacity ranging from 80 – 234 MBh. All of the AAON units are equipped with energy recovery units. The occupied cooling setpoint at the facility is 70^{O}F, occupied heating setpoint 66 °F, unoccupied cooling setpoint is 82 °F, and the unoccupied heating setpoint 61°F.

Refer to Appendix A for detailed information about each unit.

Roof Top Packaged Units

Air Conditioners

Building areas such as classrooms and offices use 4-ton split air conditioning (AC) units (Carrier) with an average EER value 10.9. The units are in good condition.

Split System AC & Thermostat

2.6 Heating Hot Water Systems

The heating system consists of two Aerco Benchmarking 1.5 condensing hot water boilers with an output capacity of 1,290 MBh operating at an efficiency of 86%. The hot water from the boilers are circulated throughout the school using two 7.5 hp variable speed pumps.

Hot water is distributed through coils in air handling units that serve some of the larger space, and through unit ventilators located in the classrooms and hot water unit heaters. The smaller zones are equipped with VAV boxes.

Direct fired gas heat is provided for additional areas through packaged units which serve music rooms, corridors 200 and 300, gymnasium, auditorium, cafeteria, and faculty lounge.

The boilers and all packaged units with furnaces were all installed in 2012, are in good condition, and are well maintained.

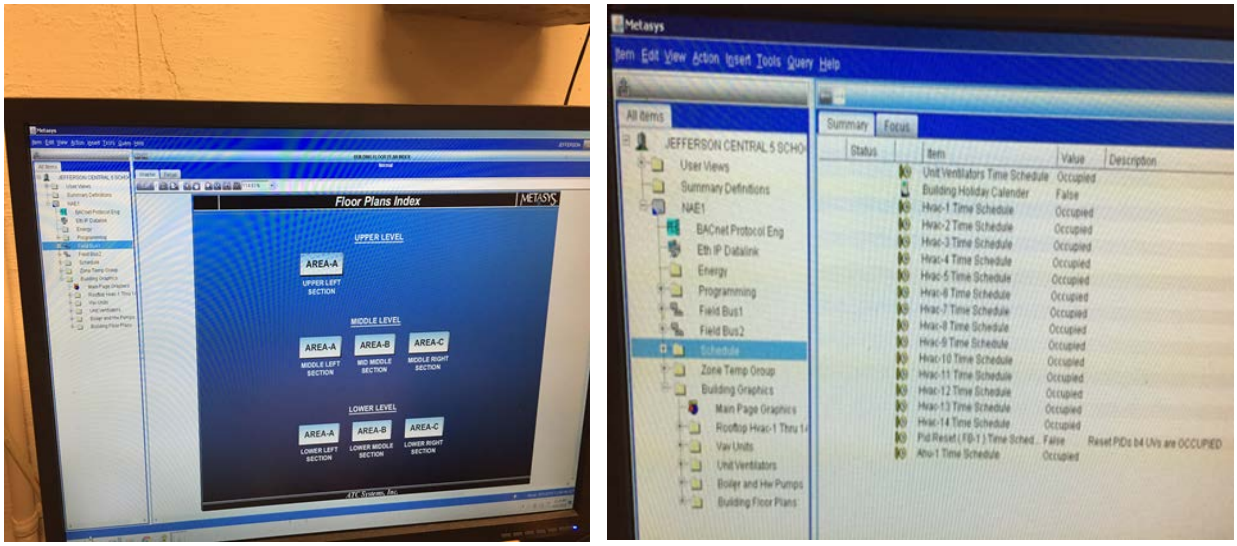
Hot water is supplied at 180°F when the outside air temperature is low, and the setpoint is adjusted linearly to 130°F when the outside air is above 60°F. The hot water return temperature is typically 74.5°F. The system is locked out at an outside temperature of 78°F.

The heating hot water system is controlled by a BAS system.

Hot Water Heating System

2.7 Building Energy Management Systems (EMS)

A Metasys EMS controls the HVAC equipment, the boilers, the air handlers, and the package units. The EMS provides equipment scheduling control and monitors space temperatures, supply air temperatures, and heating water loop temperatures.



Building Energy Management System

2.8 Domestic Hot Water

The school has three gas-fired hot water heaters. Two 95% efficient Rheem HE80-160 condensing units have input capacities of 160 MBh and tank capacities of 80 gallons. These serve the restrooms in the school.

The third condensing water heater serving the kitchen, a Rheem GHE 100-200, has an input capacity of 199 MBh, a tank capacity of 97 gallons and is 95% efficient. The water heaters are in good condition and well maintained. The hot water pipes are well insulated.

Rheem HE80-160

Rheem (GHE 100-200)

2.9 Food Service Equipment and Refrigeration

The kitchen has a mixture of gas and electric equipment used to prepare lunches for students. Most cooking is done using a convection oven and a gas-fired cooking range. Bulk prepared foods are held in several holding cabinets. Some equipment is old and in fair condition. The dishwasher is an ENERGY STAR® high temperature door-type unit equipped with an electric booster.

The kitchen has several stand-up refrigerators and freezers with either solid or glass doors. There are a couple of refrigerator chests. Most equipment is high efficiency.

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

Refrigerator freezer/chest

Stand-up refrigerators & freezers

Dishwasher

Convection oven and cooking range

2.10 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 3% percent of total building energy use. This is lower than a typical building.

The location is already be 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 117 computer work stations throughout the facility. Plug loads throughout the building include general café and office equipment.

There is one refrigerated and one non-refrigerated beverage vending machines. Vending machines are not equipped with occupancy-based controls.

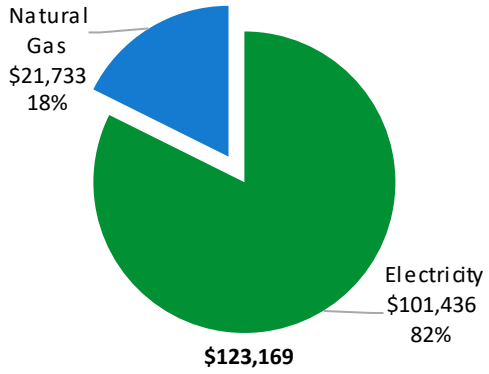
2.11 Water-Using Systems

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

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	694,084 kWh	$101,436
Natural Gas	20,599 Therms	$21,733
Total		**$123,169**



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.

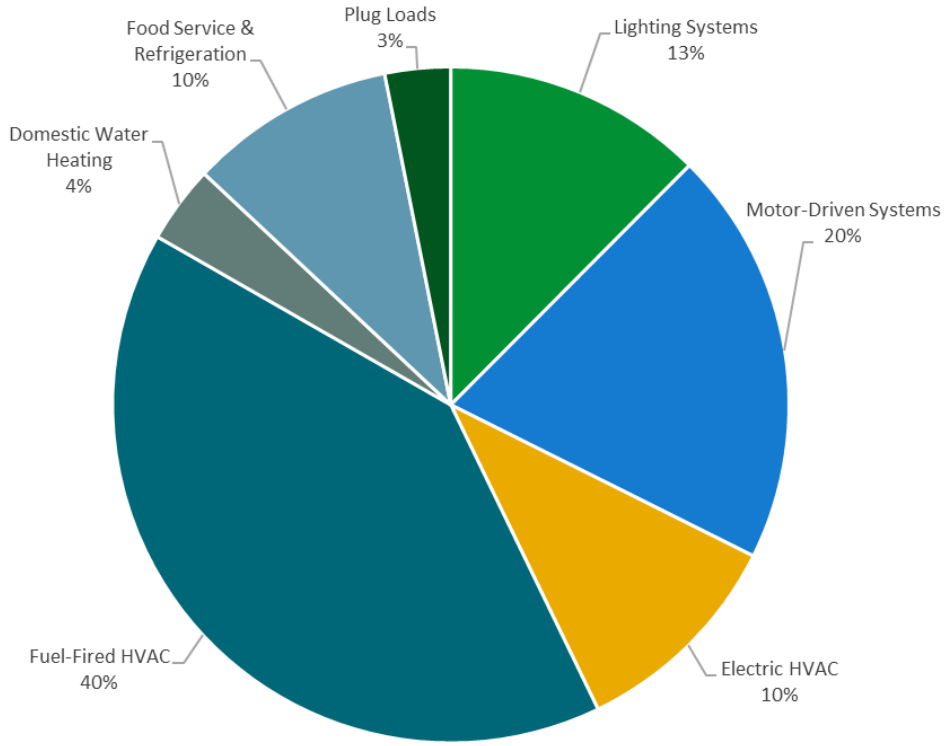
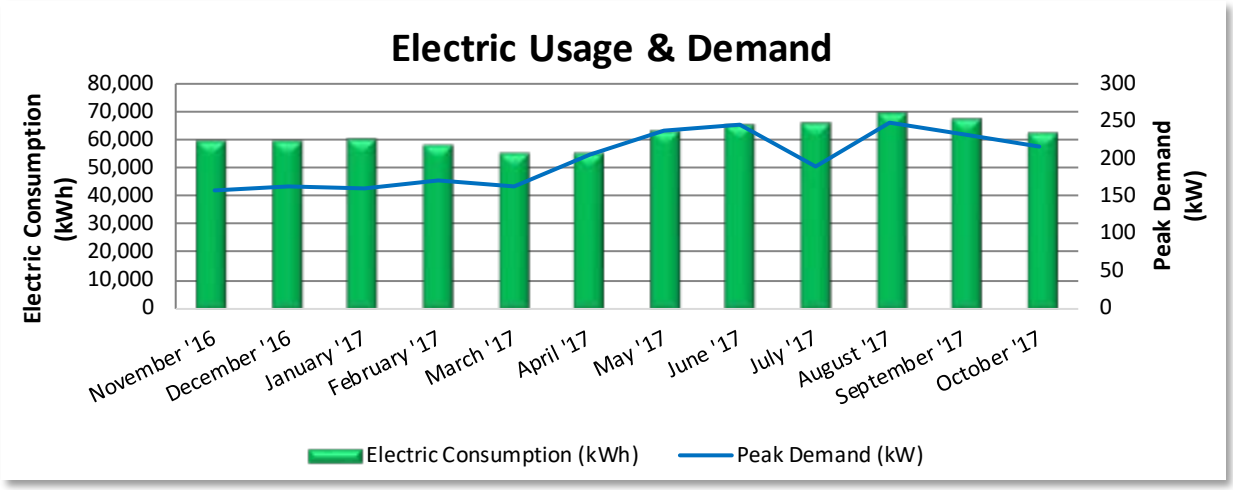


Figure 5 - Energy Balance

3.1 Electricity

PSE&G delivers electricity under rate class LPLS, with electric production provided by Agera Energy, a third-party supplier.



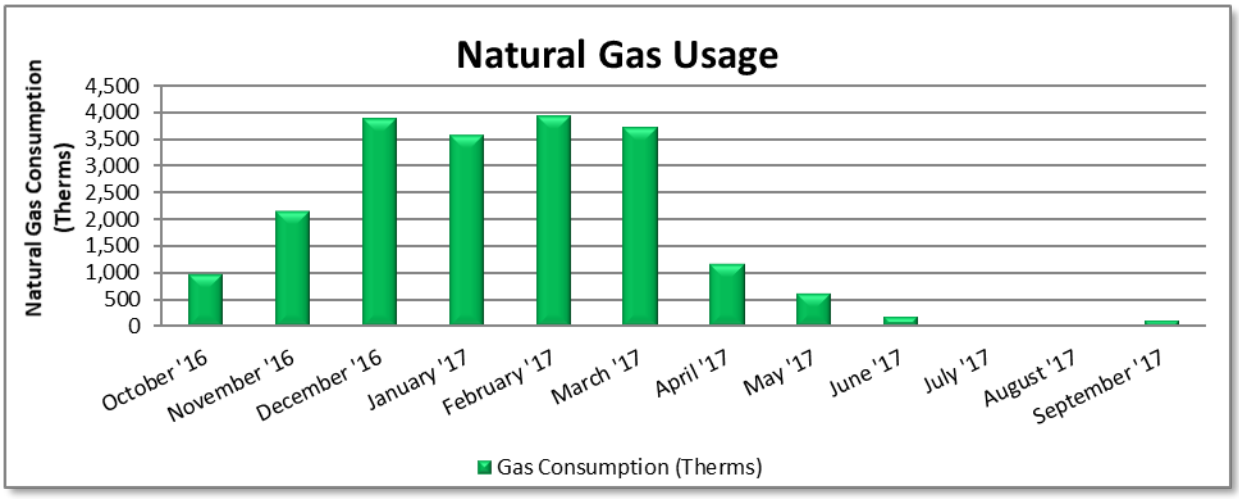
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
12/6/16	30	59,223	158	$589	$7,618
1/6/17	31	59,183	162	$603	$7,831
2/6/17	31	59,992	159	$592	$8,235
3/8/17	30	57,894	171	$639	$8,246
4/6/17	29	54,970	162	$611	$8,124
5/8/17	32	54,659	207	$788	$8,443
6/7/17	30	62,350	238	$895	$10,486
7/28/17	51	64,902	245	$674	$9,917
8/28/17	31	65,611	189	$712	$10,238
9/27/17	30	68,754	248	$949	$11,403
10/26/17	29	66,567	232	$888	$8,806
11/28/17	33	61,814	216	$826	$8,202
Totals	**387**	**735,919**	**248**	**$8,765**	**$107,550**
Annual	**365**	**694,084**	**248**	**$8,266**	**$101,436**

Notes:

- Peak demand of 248 kW occurred in September 2017.
- The average electric cost over the past 12 months was $0.146/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

Elizabethtown Gas delivers natural gas under rate class 231, with natural gas supply provided by Hudson Energy, a third-party supplier.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
10/31/16	30	996	$1,290
12/1/16	31	2,164	$2,096
1/1/17	31	3,906	$3,568
1/27/17	26	3,592	$3,161
3/1/17	33	3,949	$3,418
4/1/17	31	3,737	$3,316
5/1/17	30	1,177	$1,395
6/1/17	31	634	$999
7/1/17	30	200	$682
8/1/17	31	66	$591
9/1/17	31	61	$588
10/1/17	30	118	$629
Totals	**365**	**20,599**	**$21,733**
Annual	**365**	**20,599**	**$21,733**

Notes:

- The average gas cost for the past 12 months is $1.055/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

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

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

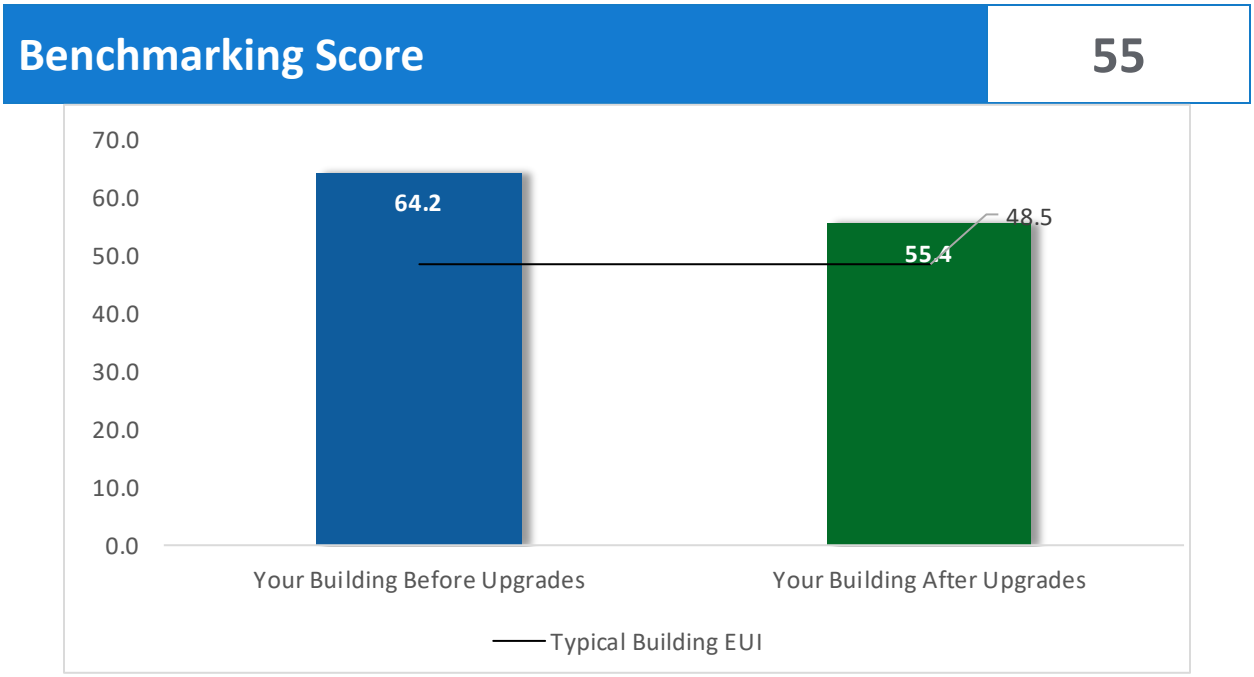


Figure 6 - Energy Use Intensity Comparison

This building performs at the national average. This report contains suggestions about how to improve building performance and reduce energy costs.

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

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[3].

[3] 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.

Appendix A: Equipment Inventory & Recommendations provides a detailed list of the locations and recommended upgrades for each energy conservation measure.

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Lifetime Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**83,912**	**24.1**	**-16**	**$12,095**	**$181,431**	**$47,322**	**$9,949**	**$37,373**	**3.1**	**82,637**
ECM 1	Install LED Fixtures	5,427	0.6	0	$793	$11,896	$5,796	$600	$5,196	6.6	5,465
ECM 2	Retrofit Fixtures with LED Lamps	78,485	23.5	-16	$11,302	$169,534	$41,526	$9,349	$32,177	2.8	77,172
Lighting Control Measures		**354**	**0.1**	**0**	**$51**	**$407**	**$540**	**$70**	**$470**	**9.2**	**347**
ECM 3	Install Occupancy Sensor Lighting Controls	354	0.1	0	$51	$407	$540	$70	$470	9.2	347
Motor Upgrades		**348**	**0.1**	**0**	**$51**	**$763**	**$23,376**	**$0**	**$23,376**	**459.8**	**350**
	Premium Efficiency Motors	348	0.1	0	$51	$763	$23,376	$0	$23,376	459.8	350
Variable Frequency Drive (VFD) Measures		**98,053**	**33.4**	**0**	**$14,330**	**$214,948**	**$77,018**	**$9,200**	**$67,818**	**4.7**	**98,739**
ECM 4	Install VFDs on Constant Volume (CV) Fans	98,053	33.4	0	$14,330	$214,948	$77,018	$9,200	$67,818	4.7	98,739
HVAC System Improvements		**942**	**0.0**	**11**	**$249**	**$3,728**	**$13,594**	**$0**	**$13,594**	**54.7**	**2,179**
	Implement Demand Control Ventilation (DCV)	942	0.0	11	$249	$3,728	$13,594	$0	$13,594	54.7	2,179
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$236**	**$1,178**	**$230**	**$0**	**$230**	**1.0**	**1,623**
ECM 5	Vending Machine Control	1,612	0.2	0	$236	$1,178	$230	$0	$230	1.0	1,623
TOTALS		**185,219**	**57.9**	**-5**	**$27,011**	**$402,453**	**$162,081**	**$19,219**	**$142,862**	**5.3**	**185,875**

* - 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		**83,912**	**24.1**	**-16**	**$12,095**	**$47,322**	**$9,949**	**$37,373**	**3.1**	**82,637**
ECM 1	Install LED Fixtures	5,427	0.6	0	$793	$5,796	$600	$5,196	6.6	5,465
ECM 2	Retrofit Fixtures with LED Lamps	78,485	23.5	-16	$11,302	$41,526	$9,349	$32,177	2.8	77,172
Lighting Control Measures		**354**	**0.1**	**0**	**$51**	**$540**	**$70**	**$470**	**9.2**	**347**
ECM 3	Install Occupancy Sensor Lighting Controls	354	0.1	0	$51	$540	$70	$470	9.2	347
Variable Frequency Drive (VFD) Measures		**98,053**	**33.4**	**0**	**$14,330**	**$77,018**	**$9,200**	**$67,818**	**4.7**	**98,739**
ECM 4	Install VFDs on Constant Volume (CV) Fans	98,053	33.4	0	$14,330	$77,018	$9,200	$67,818	4.7	98,739
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$236**	**$230**	**$0**	**$230**	**1.0**	**1,623**
ECM 5	Vending Machine Control	1,612	0.2	0	$236	$230	$0	$230	1.0	1,623
TOTALS		**183,930**	**57.8**	**-16**	**$26,712**	**$125,110**	**$19,219**	**$105,891**	**4.0**	**183,346**

* - 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		**83,912**	**24.1**	**-16**	**$12,095**	**$47,322**	**$9,949**	**$37,373**	**3.1**	**82,637**
ECM 1	Install LED Fixtures	5,427	0.6	0	$793	$5,796	$600	$5,196	6.6	5,465
ECM 2	Retrofit Fixtures with LED Lamps	78,485	23.5	-16	$11,302	$41,526	$9,349	$32,177	2.8	77,172

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 exterior fixtures containing 250-Watt metal halide lamps with new LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

In some cases, HID fixtures can be retrofitted 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 fixture(s).

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 metal halide fixtures

ECM 2: Retrofit Fixtures with LED Lamps

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

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

Affected building areas: All areas with fluorescent fixtures with T8 tubes or compact fluorescent 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		**354**	**0.1**	**0**	**$51**	**$540**	**$70**	**$470**	**9.2**	**347**
ECM 3	Install Occupancy Sensor Lighting Controls	354	0.1	0	$51	$540	$70	$470	9.2	347

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

ECM 3: Install Occupancy Sensor Lighting Controls

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

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

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

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

Affected building areas: Custodian office, room 101 E

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		**348**	**0.1**	**0**	**$51**	**$23,376**	**$0**	**$23,376**	**459.8**	**350**
	Premium Efficiency Motors	348	0.1	0	$51	$23,376	$0	$23,376	459.8	350

Premium Efficiency Motors

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

Affected motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Roof	HVAC 5	1	Supply Fan	7.5	
Roof	HVAC 2	1	Supply Fan	5.0	
Roof	HVAC-12	1	Supply Fan	7.5	
Roof	HVAC 13	1	Supply Fan	7.5	
Roof	HVAC 5	1	Exhaust Fan	5.0	
Roof	HVAC 2	1	Exhaust Fan	5.0	
Roof	HVAC-12	1	Exhaust Fan	5.0	
Roof	HVAC 13	1	Exhaust Fan	5.0	
Roof	HVAC 3	1	Supply Fan	10.0	
Roof	HVAC 3	1	Exhaust Fan	10.0	
Roof	HVAC 4	1	Supply Fan	7.5	
Roof	HVAC 4	1	Exhaust Fan	3.0	

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Roof	HVAC 10	1	Supply Fan	5.0	
Roof	HVAC 1	1	Supply Fan	5.0	
Roof	HVAC 8	1	Supply Fan	5.0	
Roof	HVAC 14	1	Supply Fan	2.0	
Roof	HVAC 10	1	Exhaust Fan	3.0	
Roof	HVAC 1	1	Exhaust Fan	3.0	
Roof	HVAC 8	1	Exhaust Fan	3.0	
Roof	HVAC 14	1	Exhaust Fan	1.0	
Roof	HVAC 6	1	Supply Fan	3.0	
Roof	HVAC 7	1	Supply Fan	3.0	
Roof	HVAC 6	1	Exhaust Fan	2.0	
Roof	HVAC 7	1	Exhaust Fan	2.0	

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*.

Based on cost effectiveness, premium efficiency motors should only be installed as needed in conjunction with any VFD measures.

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		**98,053**	**33.4**	**0**	**$14,330**	**$77,018**	**$9,200**	**$67,818**	**4.7**	**98,739**
ECM 4	Install VFDs on Constant Volume (CV) Fans	98,053	33.4	0	$14,330	$77,018	$9,200	$67,818	4.7	98,739

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 motor —unless the existing motor meets or exceeds IHP 2014 standards—to conservatively account for the cost of an inverter duty rated motor. The savings and cost associated with the new motor are presented with the Premium Efficiency Motor measures. If the proposed VFD measure is not selected for implementation the motor replacement should be reevaluated.

ECM 4: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. 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.

VAV system controls should not raise the supply air temperature at the expense of the fan power. A common mistake is to reset the supply air temperature to achieve chiller energy savings, which can lead to additional air flow requirements. Supply air temperature should be kept low (e.g. 55°F) until the minimum fan speed (typically about 50%) is met. At this point, it is efficient to raise the supply air temperature as the load decreases, but not such that additional air flow and thus fan energy is required.

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.

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

Affected air handlers: HVAC units 1-14

4.5 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)
HVAC System Improvements		**942**	**0.0**	**11**	**$249**	**$13,594**	**$0**	**$13,594**	**54.7**	**2,179**
	Implement Demand Control Ventilation (DCV)	942	0.0	11	$249	$13,594	$0	$13,594	54.7	2,179

Implement Demand Control Ventilation (DCV)

Demand control ventilation (DCV) monitors the indoor air's carbon dioxide (CO_2) content to measure room occupancy. This data is used to regulate the amount of outdoor air provided to the space for ventilation.

Standard ventilation systems often provide outside air based on a space's estimated maximum occupancy but not actual occupancy. During low occupancy periods, the space may then be over ventilated. This wastes energy through excessive fan motor usage as well as heating and cooling the excess outside air flow. DCV reduces unnecessary outdoor air intake by regulating ventilation based on actual occupancy levels. DCV is most suited for facilities where occupancy levels vary significantly from hour to hour and day to day.

Energy savings associated with DCV are based on hours of operation, space occupancy, system air flow, outside air reduction, and other factors. Energy savings results from eliminating unnecessary ventilation and space conditioning.

Affected building areas: Gymnasium units (HVAC 6,7), cafeteria (HVAC 8), auditorium units (HVAC 12,13)

4.6 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		**1,612**	**0.2**	**0**	**$236**	**$230**	**$0**	**$230**	**1.0**	**1,623**
ECM 5	Vending Machine Control	1,612	0.2	0	$236	$230	$0	$230	1.0	1,623

ECM 5: 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[4] . Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

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.

Boiler Maintenance

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

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

Furnace Maintenance

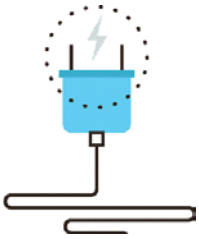
Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should: check for gas / carbon monoxide leaks; change the air and fuel filters; check components for cracks, corrosion, dirt, 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.

Plug Load Controls



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

Water Conservation

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

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

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 reduction, 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 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 a high potential for installing a PV array.

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

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

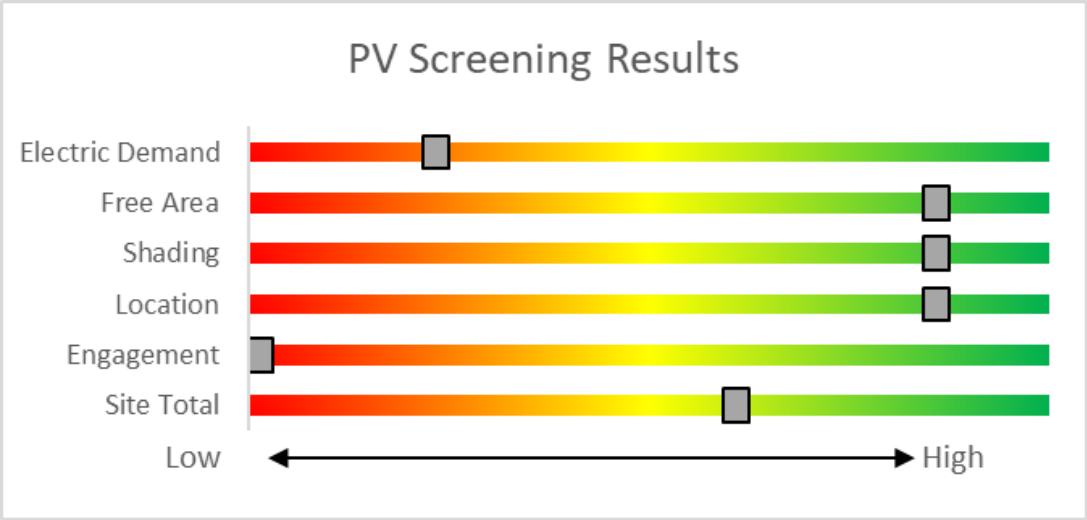


Figure 9 - Photovoltaic Screening

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 low potential for installing a cost-effective CHP system.

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

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

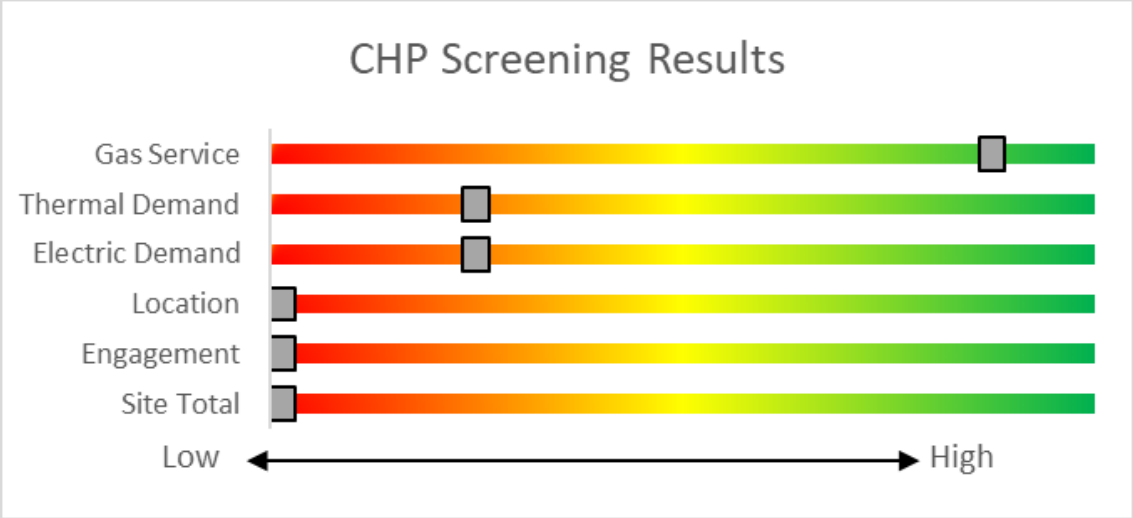


Figure 10 - Combined Heat and Power Screening

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 efficient 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 efficiency 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 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.

This site currently has a savings of 13.8%. 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 (ESIP) 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.

7.3 Energy Savings Improvement Program

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

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

How to Participate

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

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

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

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

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

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

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

7.4 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
Boiler room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,860	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,860	0.2	1,038	0	$149	$365	$100	1.8
Boiler room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Custodian office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,860	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.2	1,057	0	$152	$562	$115	2.9
Custodian 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
Custodian Office restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,860	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,860	0.0	104	0	$15	$37	$10	1.8
Room 116 A - Elevator room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
Room 117 - IT office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,860	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,860	0.0	104	0	$15	$37	$10	1.8
Storage room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.1	322	0	$46	$164	$45	2.6
Storage room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
1st floor hallway	9	Compact Fluorescent: 4 pin - 1 lamp	Timeclock	S	40	2,860	2	Relamp	No	9	LED Screw-In Lamps: 4 pin - 1 lamp	Timeclock	28	2,860	0.1	340	0	$49	$245	$0	5.0
1st floor hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Timeclock	S	32	2,860	2	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Timeclock	15	2,860	0.0	110	0	$16	$37	$10	1.7
1st floor hallway	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
1st floor hallway	15	Compact Fluorescent: 4 pin - 1 lamp	Timeclock	S	26	2,860	2	Relamp	No	15	LED Screw-In Lamps: 4 pin - 1 lamp	Timeclock	18	2,860	0.1	368	0	$53	$408	$0	7.7
1st floor hallway	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	2,860	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	2,860	0.5	1,973	0	$284	$694	$190	1.8
Main entrance	6	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	40	2,860	2	Relamp	No	6	LED Screw-In Lamps: 4 pin - 1 lamp	Wall Switch	28	2,860	0.1	227	0	$33	$163	$0	5.0
Main 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
Main office	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.4	1,182	0	$170	$602	$165	2.6
Main office	4	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	26	1,973	2	Relamp	No	4	LED Screw-In Lamps: 4 pin - 1 lamp	Occupancy Sensor	18	1,973	0.0	68	0	$10	$109	$0	11.2
Main office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
Room 101 E	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,860	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.1	594	0	$86	$434	$80	4.1
Room 101D	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.0	107	0	$15	$55	$15	2.6
Room 101C	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.1	430	0	$62	$219	$60	2.6
Room 101C	11	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	26	1,973	2	Relamp	No	11	LED Screw-In Lamps: 4 pin - 1 lamp	Occupancy Sensor	18	1,973	0.1	186	0	$27	$299	$0	11.2
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
Room 101 A	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.1	322	0	$46	$164	$45	2.6

	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 101A	7	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	26	1,973	2	Relamp	No	7	LED Screw-In Lamps: 4 pin - 1 lamp	Occupancy Sensor	18	1,973	0.0	119	0	$17	$190	$0	11.2
Room 101 A restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
Room 100A	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	430	0	$62	$219	$60	2.6
Room 100 A closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.0	107	0	$15	$55	$15	2.6
Room 100 B	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.2	537	0	$77	$274	$75	2.6
Room 100 B	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	40	1,973	2	Relamp	No	1	LED Screw-In Lamps: 4 pin - 1 lamp	Occupancy Sensor	28	1,973	0.0	26	0	$4	$27	$0	7.2
Room 100 B closet	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	26	1,973	2	Relamp	No	1	LED Screw-In Lamps: 4 pin - 1 lamp	Occupancy Sensor	18	1,973	0.0	17	0	$2	$27	$0	11.2
Room 100 B restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,860	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,860	0.0	104	0	$15	$37	$10	1.8
102 art room	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,146	0	$165	$584	$160	2.6
102 A closet	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	358	0	$52	$183	$50	2.6
102 B	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
102	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
104	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,433	0	$206	$730	$200	2.6
104 A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
106	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,433	0	$206	$730	$200	2.6
106 A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
105	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,289	0	$186	$657	$180	2.6
105 A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
107	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,361	0	$196	$694	$190	2.6
107 A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
108	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,433	0	$206	$730	$200	2.6
108 A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
110	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,433	0	$206	$730	$200	2.6
110 A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
109	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,218	0	$175	$621	$170	2.6

	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
111	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,218	0	$175	$621	$170	2.6
Boys restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	215	0	$31	$110	$30	2.6
Boys restroom	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,973	0.0	126	0	$18	$145	$20	6.9
Girls restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
Girls restroom	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	3	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,973	0.1	189	0	$27	$217	$30	6.9
Room 112 D	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
113	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.2	645	0	$93	$329	$90	2.6
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
115	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
115	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
115	18	Compact Fluorescent: 4 pin - 2 lamps	Timeclock	S	64	2,860	2	Relamp	No	18	LED Screw-In Lamps: 4 pin - 2 lamps	Timeclock	45	2,860	0.2	1,087	0	$156	$978	$0	6.3
Kitchen	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.4	1,075	0	$155	$548	$150	2.6
Kitchen	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
Kitchen storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
Room 114	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 114	28	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Timeclock	S	114	2,860	2	Relamp	No	28	LED - Linear Tubes: (4) 4' Lamps	Timeclock	58	2,860	1.1	4,933	-1	$710	$2,045	$560	2.1
114 A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.1	215	0	$31	$110	$30	2.6
Girls restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
Boys restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	215	0	$31	$110	$30	2.6
114 D	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
2nd floor hallway	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
2nd floor hallway	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	2,860	2	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	2,860	0.5	2,180	0	$314	$767	$210	1.8
2nd floor hallway	26	Compact Fluorescent: 4 pin - 1 lamp	Timeclock	S	26	2,860	2	Relamp	No	26	LED Screw-In Lamps: 4 pin - 1 lamp	Timeclock	18	2,860	0.1	638	0	$92	$707	$0	7.7
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
209	4	Compact Fluorescent: 4 pin - 4 lamps	Occupancy Sensor	S	128	1,973	2	Relamp	No	4	LED Screw-In Lamps: 4 pin - 4 lamps	Occupancy Sensor	90	1,973	0.1	333	0	$48	$435	$0	9.1

	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
209	31	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	31	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.7	2,221	0	$320	$1,132	$310	2.6
209	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
209 A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.1	215	0	$31	$110	$30	2.6
Closet	1	Compact Fluorescent: 4 pin - 1 lamp	Occupancy Sensor	S	26	1,973	2	Relamp	No	1	LED Screw-In Lamps: 4 pin - 1 lamp	Occupancy Sensor	18	1,973	0.0	17	0	$2	$27	$0	11.2
Room 210	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,146	0	$165	$584	$160	2.6
Room 212	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,218	0	$175	$621	$170	2.6
Room 214	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.2	716	0	$103	$365	$100	2.6
Room 211	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,289	0	$186	$657	$180	2.6
Room 213	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,146	0	$165	$584	$160	2.6
Room 216	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,146	0	$165	$584	$160	2.6
Room 218	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,218	0	$175	$621	$170	2.6
Room 215	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,218	0	$175	$621	$170	2.6
Room 217	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,218	0	$175	$621	$170	2.6
Room 220 A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
Boys restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	215	0	$31	$110	$30	2.6
Boys restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,973	0.0	63	0	$9	$72	$10	6.9
Girls restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,973	0.0	63	0	$9	$72	$10	6.9
Girls restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	215	0	$31	$110	$30	2.6
Room 220 D	1	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	26	2,860	2	Relamp	No	1	LED Screw-In Lamps: 4 pin - 1 lamp	Wall Switch	18	2,860	0.0	25	0	$4	$27	$0	7.7
222 A	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.3	788	0	$113	$402	$110	2.6
Room 222B	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.2	501	0	$72	$256	$70	2.6
221 A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.1	215	0	$31	$110	$30	2.6
221 B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,973	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,973	0.1	215	0	$31	$110	$30	2.6
221 C	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	430	0	$62	$219	$60	2.6
221 C	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	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
Stairwell 3	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	2,860	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	2,860	0.1	623	0	$90	$219	$60	1.8
Stairwell 3	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
3rd floor hallway	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	2,860	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	2,860	0.3	1,142	0	$164	$402	$110	1.8
3rd floor hallway	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Girls restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
Room 301	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,361	0	$196	$694	$190	2.6
Room 302	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,433	0	$206	$730	$200	2.6
Room 302 A	1	Compact Fluorescent: 4 pin - 1 lamp	Wall Switch	S	26	2,860	2	Relamp	No	1	LED Screw-In Lamps: 4 pin - 1 lamp	Wall Switch	18	2,860	0.0	25	0	$4	$27	$0	7.7
303	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,361	0	$196	$694	$190	2.6
304	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,361	0	$196	$694	$190	2.6
305	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,361	0	$196	$694	$190	2.6
306	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,361	0	$196	$694	$190	2.6
308 A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,860	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,860	0.0	104	0	$15	$37	$10	1.8
Boys restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
307	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.5	1,361	0	$196	$694	$190	2.6
308	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.3	1,003	0	$144	$511	$140	2.6
2 R hallway	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	2,860	2	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	2,860	0.4	1,765	0	$254	$621	$170	1.8
2 R 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
Girls restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
Room 201	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.3	1,003	0	$144	$511	$140	2.6
Room 202	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.3	1,003	0	$144	$511	$140	2.6
Room 202A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	72	0	$10	$37	$10	2.6
Room 203	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.3	1,003	0	$144	$511	$140	2.6
Room 205	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.3	1,003	0	$144	$511	$140	2.6
Room 207	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.3	1,003	0	$144	$511	$140	2.6

	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
Boys restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
206 A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	287	0	$41	$146	$40	2.6
206	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.4	1,218	0	$175	$621	$170	2.6
204 B	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
204 B	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
204 A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.1	287	0	$41	$146	$40	2.6
Auditorium	26	Compact Fluorescent: 4 pin - 2 lamps	Occupancy Sensor	S	64	1,973	2	Relamp	No	26	LED Screw-In Lamps: 4 pin - 2 lamps	Occupancy Sensor	45	1,973	0.4	1,084	0	$156	$1,413	$0	9.1
Auditorium	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Auditorium	8	Linear Fluorescent - T5: 2' T5 (14W) - 1L	Occupancy Sensor	S	18	1,973	2	Relamp	No	8	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	1,973	0.1	165	0	$24	$130	$24	4.5
204 D	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
204 C	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
Stairwell 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	2,860	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	2,860	0.1	415	0	$60	$146	$40	1.8
Stairwell 2	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
Stairwell 1	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock	S	62	2,860	2	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Timeclock	29	2,860	0.2	831	0	$120	$292	$80	1.8
Stairwell 1	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 116 C	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,973	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,973	0.0	143	0	$21	$73	$20	2.6
Exterior recessed	28	Compact Fluorescent: 4 pin - 2 lamps	Timeclock		52	4,380	2	Relamp	No	28	LED Screw-In Lamps: 4 pin - 2 lamps	Timeclock	36	4,380	0.2	1,913	0	$280	$1,522	$0	5.4
Pole lighting	6	Metal Halide: (1) 250W Lamp	Timeclock		295	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	89	4,380	0.6	5,427	0	$793	$5,796	$600	6.6
Wall pack	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		120	4,380		None	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	120	4,380	0.0	0	0	$0	$0	$0	0.0
Wall pack	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		155	4,380		None	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	155	4,380	0.0	0	0	$0	$0	$0	0.0
Wall pack	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		9	4,380		None	No	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	9	4,380	0.0	0	0	$0	$0	$0	0.0
Wall pack	5	Compact Fluorescent: 2 pin - 1 lamp	Timeclock		13	4,380	2	Relamp	No	5	LED Screw-In Lamps: 2 pin - 1 lamp	Timeclock	9	4,380	0.0	85	0	$12	$136	$0	10.9
Wall pack	13	Compact Fluorescent: 4 pin - 1 lamp	Timeclock		26	4,380	2	Relamp	No	13	LED Screw-In Lamps: 4 pin - 1 lamp	Timeclock	18	4,380	0.1	444	0	$65	$353	$0	5.4

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
Roof	Restroom	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Unknown	2	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Heating system	2	Heating Hot Water Pump	7.5	91.0%	Yes	W	1,696		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Heating system	2	Process Pump	5.0	86.5%	No	W	1,373		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Room 116 A	Elevator	1	Other	25.0	91.7%	No	W	800		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Room 116 A	Elevator	1	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Above ceiling	School	4	Exhaust Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
All school	Classrooms	19	Supply Fan	0.3	60.0%	No	W	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 5	1	Supply Fan	7.5	91.0%	No	W	2,745	NR, 4	Yes	91.7%	Yes	1	2.2	6,416	0	$938	$4,761	$600	4.4
Roof	HVAC 2	1	Supply Fan	5.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	1.4	4,290	0	$627	$4,197	$400	6.1
Roof	HVAC-12	1	Supply Fan	7.5	91.0%	No	W	2,745	NR, 4	Yes	91.7%	Yes	1	2.2	6,416	0	$938	$4,761	$600	4.4
Roof	HVAC 13	1	Supply Fan	7.5	91.0%	No	W	2,745	NR, 4	Yes	91.7%	Yes	1	2.2	6,416	0	$938	$4,761	$600	4.4
Roof	HVAC 5	1	Exhaust Fan	5.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	1.5	4,290	0	$627	$4,197	$400	6.1
Roof	HVAC 2	1	Exhaust Fan	5.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	1.5	4,290	0	$627	$4,197	$400	6.1
Roof	HVAC-12	1	Exhaust Fan	5.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	1.5	4,290	0	$627	$4,197	$400	6.1
Roof	HVAC 13	1	Exhaust Fan	5.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	1.5	4,290	0	$627	$4,197	$400	6.1
Roof	HVAC 3	1	Supply Fan	10.0	91.7%	No	W	2,745	NR, 4	Yes	91.7%	Yes	1	2.9	8,374	0	$1,224	$5,375	$800	3.7
Roof	HVAC 3	1	Exhaust Fan	10.0	91.7%	No	W	2,745	NR, 4	Yes	91.7%	Yes	1	3.0	8,374	0	$1,224	$5,375	$800	3.7
Roof	HVAC 4	1	Supply Fan	7.5	91.0%	No	W	2,745	NR, 4	Yes	91.7%	Yes	1	2.2	6,416	0	$938	$4,761	$600	4.4
Roof	HVAC 4	1	Exhaust Fan	3.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	0.9	2,574	0	$376	$3,812	$240	9.5

		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
Roof	HVAC 10	1	Supply Fan	5.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	1.4	4,290	0	$627	$4,197	$400	6.1
Roof	HVAC 1	1	Supply Fan	5.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	1.4	4,290	0	$627	$4,197	$400	6.1
Roof	HVAC 8	1	Supply Fan	5.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	1.4	4,290	0	$627	$4,197	$400	6.1
Roof	HVAC 14	1	Supply Fan	2.0	86.5%	No	W	2,745	NR, 4	Yes	86.5%	Yes	1	0.6	1,776	0	$259	$3,623	$160	13.3
Roof	HVAC 10	1	Exhaust Fan	3.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	0.9	2,574	0	$376	$3,812	$240	9.5
Roof	HVAC 1	1	Exhaust Fan	3.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	0.9	2,574	0	$376	$3,812	$240	9.5
Roof	HVAC 8	1	Exhaust Fan	3.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	0.9	2,574	0	$376	$3,812	$240	9.5
Roof	HVAC 14	1	Exhaust Fan	1.0	85.5%	No	W	2,745	NR, 4	Yes	85.5%	Yes	1	0.3	898	0	$131	$3,283	$80	24.4
Roof	HVAC 11	1	Supply Fan	2.0	86.5%	No	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 11	1	Exhaust Fan	1.0	85.5%	No	W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 6	1	Supply Fan	3.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	0.9	2,574	0	$376	$3,812	$240	9.5
Roof	HVAC 7	1	Supply Fan	3.0	89.5%	No	W	2,745	NR, 4	Yes	89.5%	Yes	1	0.9	2,574	0	$376	$3,812	$240	9.5
Roof	HVAC 6	1	Exhaust Fan	2.0	86.5%	No	W	2,745	NR, 4	Yes	86.5%	Yes	1	0.6	1,776	0	$259	$3,623	$160	13.3
Roof	HVAC 7	1	Exhaust Fan	2.0	86.5%	No	W	2,745	NR, 4	Yes	86.5%	Yes	1	0.6	1,776	0	$259	$3,623	$160	13.3

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
Roof	HVAC 5	1	Packaged AC	16.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 2	1	Packaged AC	16.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 3	1	Packaged AC	20.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 4	1	Packaged AC	13.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 10	1	Packaged AC	11.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 1	1	Packaged AC	11.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 11	1	Packaged AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RAC-1	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC-12	1	Packaged AC	16.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 13	1	Packaged AC	16.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RAC-2,3	2	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RAC-4,5	2	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 6	1	Packaged AC	7.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 7	1	Packaged AC	7.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 8	1	Packaged AC	11.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	HVAC 14	1	Packaged AC	11.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RVC 13	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RVC 10	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RVC 12	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RVC 11	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0

		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
Roof	RVC 9	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RVC 8	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RVC 8	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RVC 7	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	RVC 6	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Roof	ACU - 1	1	Split-System AC	4.00		W		No							0.0	0	0	$0	$0	$0	0.0
Main entrance	Main entrance	1	Electric Resistance Heat		17.06			No							0.0	0	0	$0	$0	$0	0.0

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
Boiler room	School	2	Condensing Hot Water Boiler	######	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	Building	2	Furnace	81.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	Building	2	Furnace	120.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	Building	2	Furnace	218.70	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	Building	1	Furnace	234.00	W		No						0.0	0	0	$0	$0	$0	0.0

Demand Control Ventilation Recommendations

		Recommendation Inputs					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Number of Zones	Cooling Capacity of Controlled System (Tons)	Electric Heating Capacity of Controlled System (kBtu/hr)	Output Heating Capacity of Controlled System (MBh)	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
Roof	Gymnasium - HVAC 6,7	NR	4.00	7.00		120.00	0.0	194	3	$60	$5,438	$0	90.1
Roof	Cafeteria - HVAC 8	NR	2.00	11.00		80.00	0.0	305	2	$66	$2,719	$0	41.3
Roof	Auditorium - 12,13	NR	4.00	16.00		218.00	0.0	443	5	$122	$5,438	$0	44.5

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
Boiler room	School	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Room 112 D	School	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Kitchen	Kitchen	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	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	2	Refrigerator Chest	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	3	Stand-Up Freezer, Glass Door (≤15 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	No		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Self-Contained Unit (≥175 lbs/day), Batch	Yes		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Cafeteria	3	Electric Combination Oven/Steam Cooker (<15 Pans)	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Half Size)	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Half Size)	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Fryer	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	3	Insulated Food Holding Cabinet (1/2 Size)	No		No	0.0	0	0	$0	$0	$0	0.0

Dishwasher Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Water Heater Fuel Type	Booster Heater Fuel 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	Payback w/ Incentives in Years
Kitchen	1	Single Tank Conveyor (High Temp)	Natural Gas	Electric	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?
Jefferson ES	6	Refrigerator	220.0	Yes
Jefferson ES	117	Computer	145.0	Yes
Jefferson ES	5	Microwave	1,000.0	Yes
Jefferson ES	3	Copy machine	220.0	Yes
Jefferson ES	3	Wall TV	100.0	Yes
Jefferson ES	32	Printer	60.0	Yes
Jefferson ES	1	Small freezer	60.0	Yes
Jefferson ES	3	Coffee Machine	400.0	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
Room 113	1	Refrigerated	5	Yes	0.2	1,612	0	$236	$230	$0	1.0

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.

LEARN MORE AT energystar.gov

ENERGY STAR® Statement of Energy Performance

55

ENERGY STAR® Score[1]

Jefferson Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 68,940
Built: 1924

For Year Ending: September 30, 2017
Date Generated: December 05, 2018

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
Jefferson Elementary School 155 Hilton Avenue Vauxhall, New Jersey 07088	_____ , (___)___-_____	____ _____ , (___)___-_____ _____

Property ID: 6455052

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
63.5 kBtu/ft²

Source EUI
125.7 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,056,678 (47%)
Electric - Grid (kBtu)	2,324,047 (53%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	67.1
National Median Source EUI (kBtu/ft²)	132.7
% Diff from National Median Source EUI	-5%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	345

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

____ _____
,
(___)___-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate financial savings. 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	A British thermal unit is the amount of heat required to increase the temperature of one pound water by one-degree Fahrenheit. Commonly used to measure natural gas consumption.
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.
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 energy management systems.
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
HVAC	Heating, ventilation, and air conditioning.
kW	Kilowatt. Equal to 1,000 Watts.
Load	The total amount of power used by a building system 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.
MMBtu	One million British thermal units.
psig	Pounds per square inch.
Plug Load	Refers to the amount of energy used in a space by products that are powered by means of an ordinary AC plug.
Simple Payback	The amount of time needed to recoup the funds expended in an investment, or to reach the break-even point.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
Turnkey	Provision of a complete product or service that is ready for immediate use
Watt (W)	Unit of power commonly used to measure electricity use.