Local Government Energy Audit Report

Dr. Antonia Pantoja School

July 31, 2019

Prepared for:

Elizabeth Public School
505 Morris Avenue
Elizabeth, New Jersey 07208

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.

The New Jersey 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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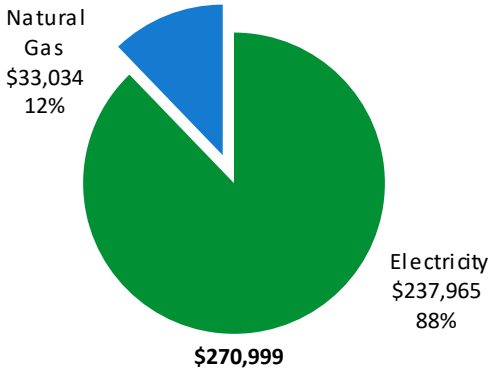
1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Dr. Antonia Pantoja 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 to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $270,999 Electricity: 1,705,697 kWh Natural Gas: 34,867 Therms	
ENERGY STAR® Benchmarking Score	14 *(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.

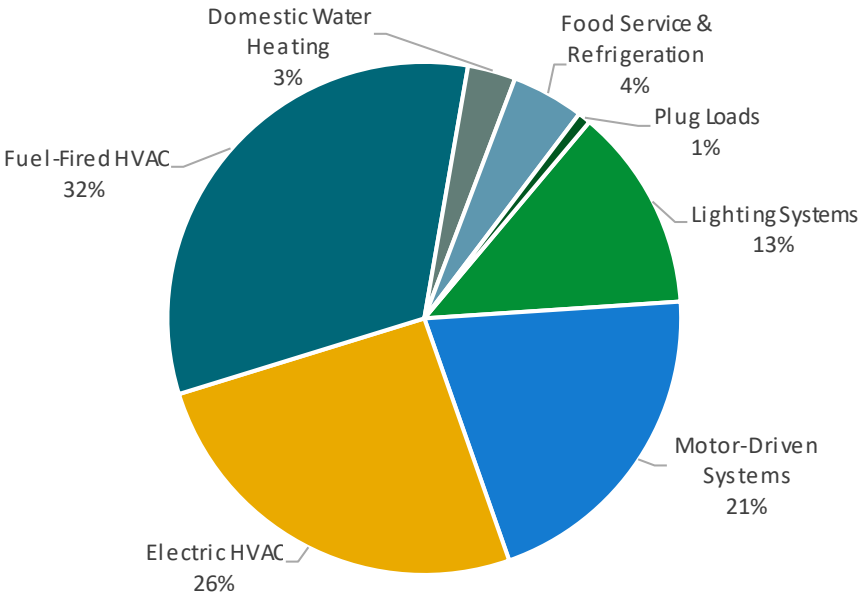


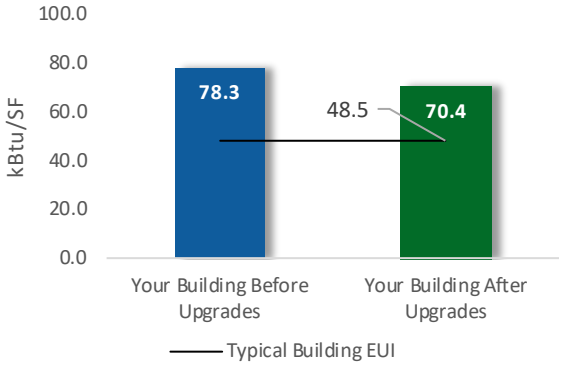
Figure 1 - Energy Use by System

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.

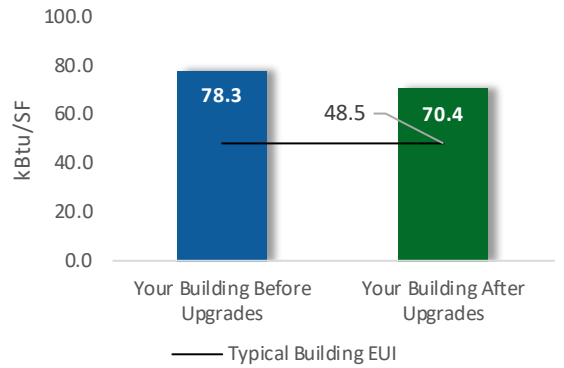
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$140,389
Potential Rebates & Incentives[1]	$23,751
Annual Cost Savings	$37,890
Annual Energy Savings	Electricity: 270,541 kWh Natural Gas: 154 Therms
Greenhouse Gas Emission Savings	137 Tons
Simple Payback	3.1 Years
Site Energy Savings (all utilities)	10%



Scenario 2: Cost Effective Package[2]

Installation Cost	$140,389
Potential Rebates & Incentives	$23,751
Annual Cost Savings	$37,890
Annual Energy Savings	Electricity: 270,541 kWh Natural Gas: 154 Therms
Greenhouse Gas Emission Savings	137 Tons
Simple Payback	3.1 Years
Site Energy Savings (all utilities)	10%



On-site Generation Potential

Photovoltaic	Medium
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	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		**196,316**	**51.2**	**-38**	**$27,027**	**$405,408**	**$77,348**	**$19,416**	**$57,932**	**2.1**	**193,225**
ECM 1	Install LED Fixtures	9,858	1.1	0	$1,375	$20,630	$3,295	$510	$2,785	2.0	9,927
ECM 2	Retrofit Fixtures with LED Lamps	186,458	50.0	-38	$25,652	$384,779	$74,053	$18,906	$55,147	2.1	183,298
Lighting Control Measures		**32,227**	**7.3**	**-7**	**$4,432**	**$35,458**	**$27,360**	**$4,335**	**$23,025**	**5.2**	**31,663**
ECM 3	Install Occupancy Sensor Lighting Controls	20,609	5.0	-4	$2,834	$22,675	$18,360	$2,310	$16,050	5.7	20,249
ECM 4	Install High/Low Lighting Controls	11,618	2.3	-2	$1,598	$12,782	$9,000	$2,025	$6,975	4.4	11,414
Custom Measures		**41,999**	**0.0**	**60**	**$6,430**	**$32,150**	**$35,681**	**$0**	**$35,681**	**5.5**	**49,346**
ECM 5	Retro-Commissioning Study & HVAC Improvements	41,999	0.0	60	$6,430	$32,150	$35,681	$0	$35,681	5.5	49,346
TOTALS (COST EFFECTIVE MEASURES)		**270,541**	**58.5**	**15**	**$37,890**	**$473,016**	**$140,389**	**$23,751**	**$116,638**	**3.1**	**274,234**
TOTALS (ALL MEASURES)		**270,541**	**58.5**	**15**	**$37,890**	**$473,016**	**$140,389**	**$23,751**	**$116,638**	**3.1**	**274,234**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.
** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 2 – Evaluated Energy Improvements

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

1.1 Planning Your Project

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

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

Pick Your Installation Approach

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

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

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	x		
ECM 2	Retrofit Fixtures with LED Lamps	x		
ECM 3	Install Occupancy Sensor Lighting Controls	x		
ECM 4	Install High/Low Lighting Controls	x		
ECM 5	Retro-Commissioning Study & HVAC Improvements			

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 loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

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

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

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

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

Ongoing Electric Savings with Demand Response

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

2 EXISTING CONDITIONS

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

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

2.1 Site Overview

On February 7, 2019, TRC performed an energy audit at Dr. Antonia Pantoja School located in Elizabeth, New Jersey. TRC met with Sandra Llerena to review the school operations and help focus our investigation on specific energy-using systems.

Dr. Antonia Pantoja School is a three-story, 118,806 square foot school building built in 2008. The school serves pre-Kindergarten through 8th grade. Spaces include: classrooms, a gymnasium, an auditorium, offices, a kitchen, corridors, stairwells, and mechanical space.

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

2.2 Building Occupancy

The school is generally occupied from September through June. Typical weekday occupancy is 122 staff and 1,012 students.

Building Name	Weekday/Weekend	Operating Schedule
Dr. Antonia Pantoja School	Weekday	8:00 AM - 4:00 PM
	Weekend	special events (Sat, 8:00 AM - 4:00 PM)

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a brick facade. The roof for the school is made of mostly flat roof sections, which are covered with an impermeable membrane and in good condition. There are a few shingled pitched roof sections as well.

All the windows are operable and are double-glazed with metal frames. The windows are in good condition. The exterior doors have metal frames that are also in good condition.

Façade and Windows

Roof

Main Entrance

Exterior Doors

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. There are also several compact fluorescent lamps (CFLs) and incandescent lamps. Typically, T8 fluorescent lamps use electronic ballasts.

The main and small gymnasiums have fixtures with CFL lamps. All exit signs use LED sources. Most fixtures are in good condition. Most lighting fixtures are controlled manually; however, some are automatically switched by occupancy sensors. Interior lighting levels were generally sufficient.

T8 Fixtures

T8 Fixtures (Cafeteria)

Recessed CFL

CFL Fixtures (Main Gym)

T8s in Classroom

Recessed CFL

Exterior fixtures include metal halide (MH), fluorescent, and CFL sources. There are recessed and wall pack CFL and MH fixtures throughout the exterior and fluorescent in the basement garage. Exterior fixtures are timer controlled.

Wall Pack

Garage T8 Fixtures

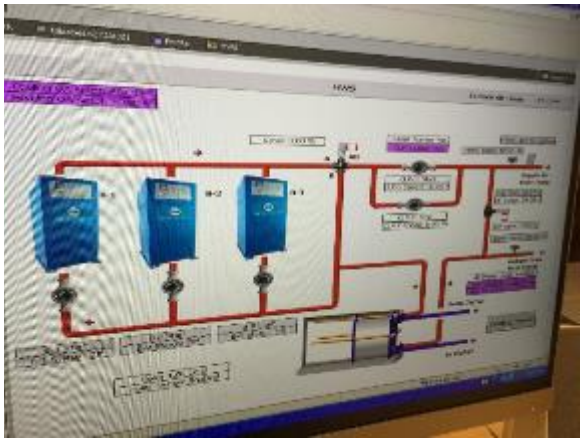
2.5 Air Handling Systems

Water Source Heat Pump Units and Heat Recovery Ventilators

There are approximately 50 water-source heat pump (HP) units used to condition various spaces throughout the building. The units provide space heating and cooling. The HP water loop for the units is maintained by three boilers and a cooling tower that is controlled by the building EMS. The HP water loop is kept between 70 and 85 °F. Capacity for each of the units is 10 tons and the cooling EER is 13.4. The heating COP is 5.0. The units are in good condition.

There are 11 heat-recovery ventilation (HRV) units that serve the HP units' outside air ventilation. The supply/ventilation fan for these units range from 2 to 5 hp, and the exhaust fans' range from 2 to 3 hp. The units are in good condition.

Heat Pump Unit



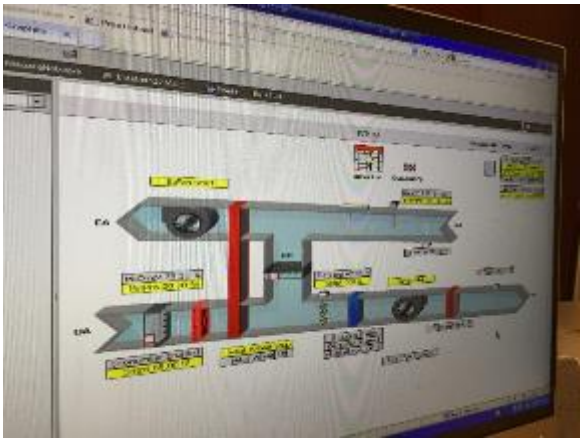
EMS Boiler/Heat Pump Loop

Heat Recovery Unit

Cooling Tower

Packaged Units

A total of four roof-mounted package AC units serve the two gymnasiums. Two of the units have a capacity of 20 tons and two 25 tons. The units are in good condition and have efficiency estimated to be 11.0 EER.



EMS: Package Unit

Package Unit

Air Conditioners

There is one split-system heat pump air conditioner (AC) units for the Elevator Room and two for Room B003A. The cooling capacity for these units is 1.5 tons. The efficiency for these units is estimated to be 12.0 EER.

Split-System Heat Pump (Outdoor Unit)

Split-System Heat Pump (Indoor Unit)

Electric Resistance Heaters

There are about 11 Taskmaster electric resistance fan heaters located in various rooms of the building. The units have a heating capacity between 11.26 and 17 Mbh.

Fan Heater

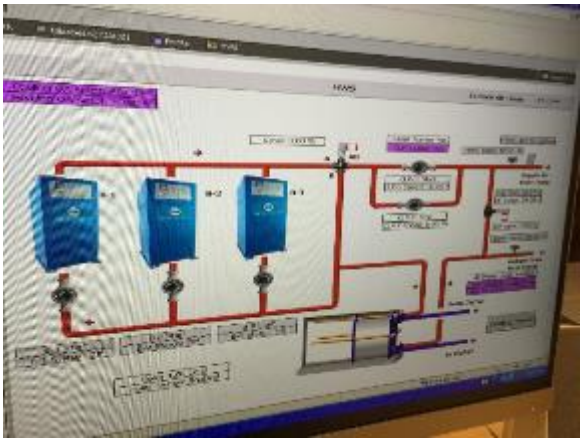
Fan Heater

2.6 Heating Hot Water Systems

Three Harsco PK 1,500 MBh hot water boilers serve the heat pump (HP) water loop for the HP units. The HP water loop is kept between 70 and 85 °F. The boilers are non-condensing with an efficiency of 85%. The hot water loop is variable flow with two VFD driven 30 hp hot water pumps. The pumps operate with a lead/lag control scheme.

Boilers

Hot Water Pumps (HP Water Loop)

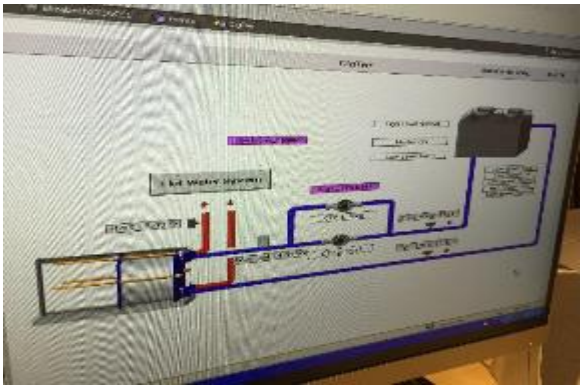


EMS: HW Water Loop Pump

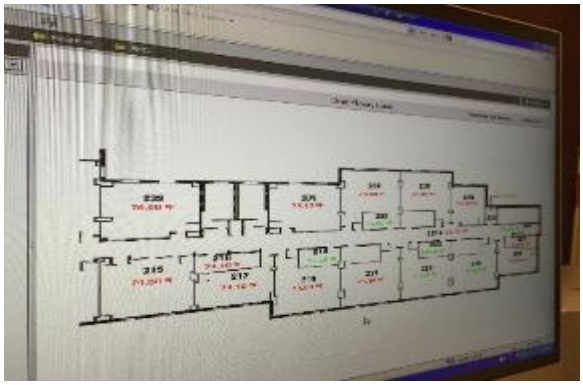
HP Water Loop Pump VFDs

2.7 Building Energy Management Systems (EMS)

A Honeywell EMS controls the HVAC equipment, boilers, chiller, air handlers, package units, DHW heaters, VAVs, and fan coil units. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, humidity, heating water loop temperatures, and chilled water loop temperatures.



EMS: Cooling Tower



EMS: Zone Temps

2.8 Domestic Hot Water

Hot water is produced with two 500 MBh gas-fired storage water heaters with 84% thermal efficiency. Each hot water heater has a 500-gallon hot water storage capacity. The water heaters are in good condition.

DHW Heater

2.9 Food Service Equipment

The kitchen has gas cooking equipment used to prepare meals for students and staff. Most cooking is done using gas convection ovens. Bulk prepared foods are held in several electric holding cabinets. The equipment is in good condition.

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

Ovens

Steamers, Kettle

Steamer

Fryer

2.10 Refrigeration

The kitchen has a medium temperature freezer walk-in as well as a walk-in cooler. The kitchen additionally has a refrigerator chest and some stand-up refrigeration equipment. All the equipment is in good condition.

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

Condenser units for Walk-Ins

Walk-In Freezer

2.11 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 1% percent of total building energy use. This is lower than a typical building.

You seem to already be doing a great job managing your electrical plug loads. This report makes additional suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are roughly 105 computer workstations throughout the school. There are 61 desk printers and 12 photocopiers throughout the building. The faculty room and various offices have a total of 16 small refrigerators and seven coffee machines.

2.12 Water-Using Systems

There are several restrooms at the school. A sampling of restrooms found that the faucets are rated for 2.2 gallons per minute (gpm) or lower.

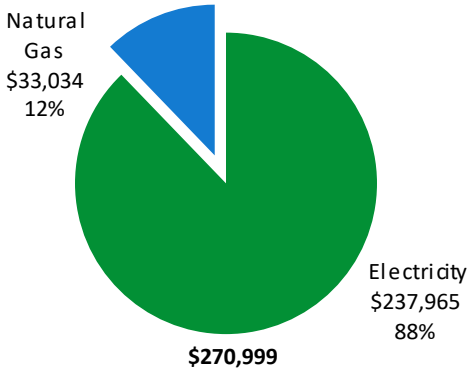
Sinks

Showers

3 ENERGY USE AND COSTS

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	1,705,697 kWh	$237,965
Natural Gas	34,867 Therms	$33,034
Total		**$270,999**



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.

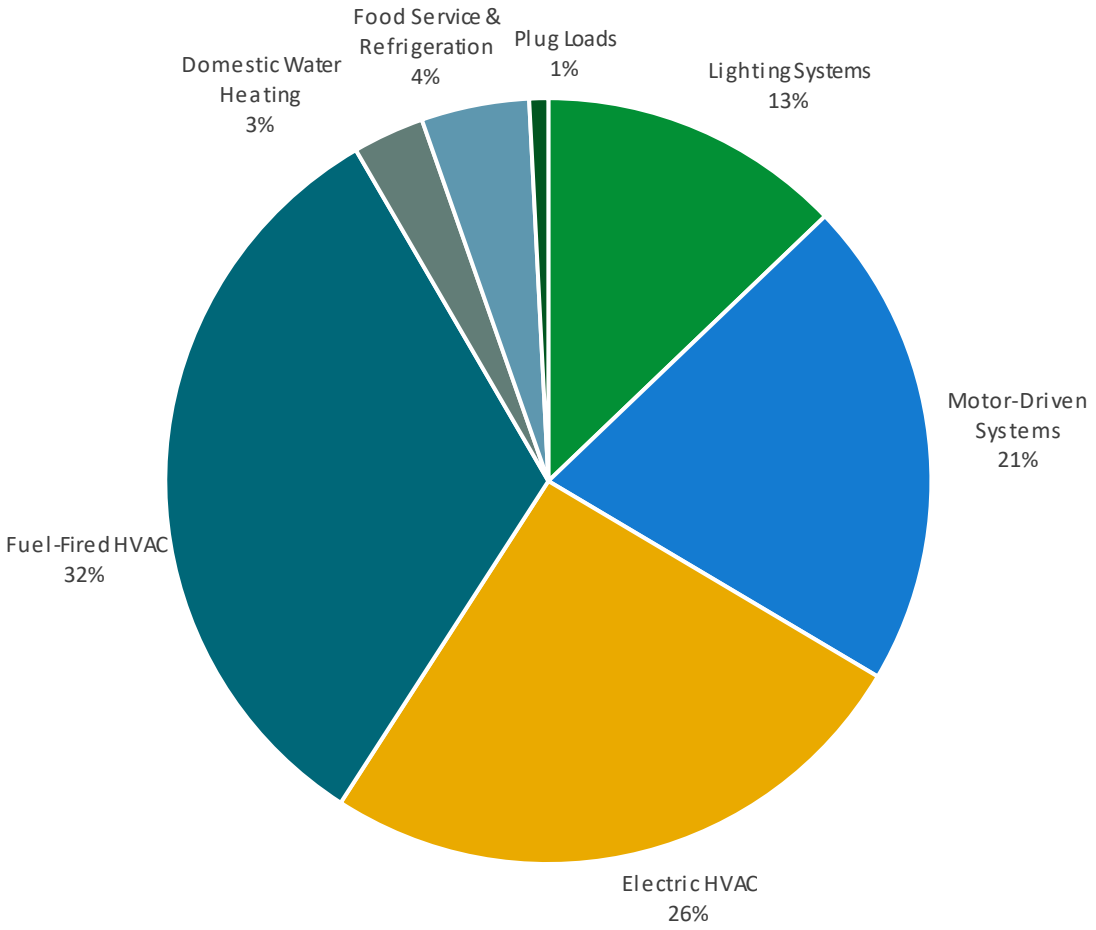
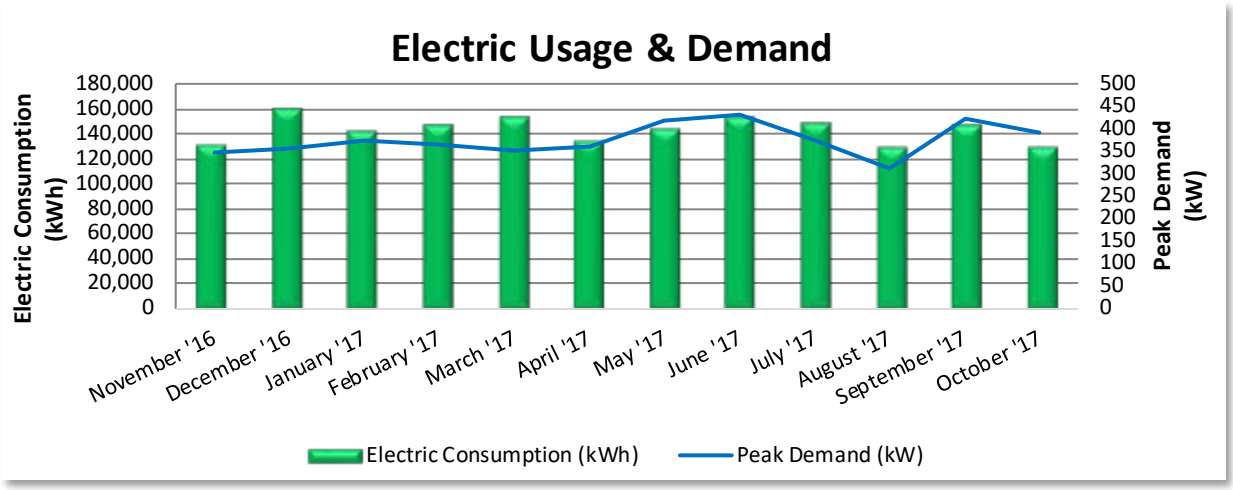


Figure 5 - Energy Balance

3.1 Electricity

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



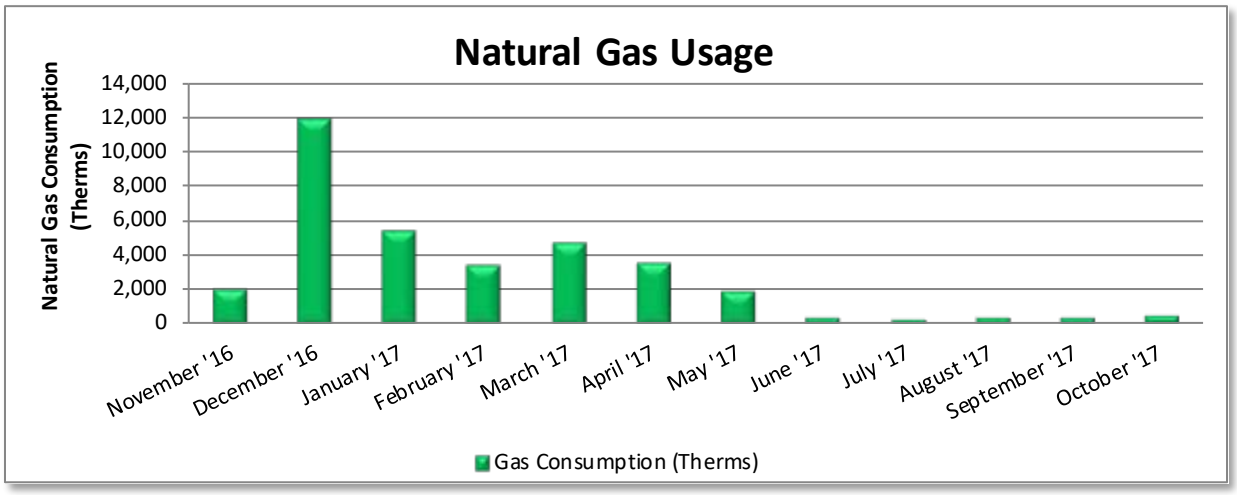
Electric Billing Data						
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**	**TRC Estimated Usage?**
12/1/16	29	130,185	346	$1,287	$16,944	No
1/3/17	33	157,791	358	$1,331	$20,481	No
2/1/17	29	141,095	372	$1,383	$18,546	No
3/3/17	30	146,441	363	$1,350	$19,248	Yes
4/3/17	31	151,786	353	$1,331	$19,765	No
5/3/17	30	132,314	361	$1,359	$17,473	No
6/2/17	30	141,951	416	$1,567	$18,808	No
7/3/17	31	151,940	433	$1,629	$23,933	No
8/2/17	30	146,881	374	$1,410	$22,588	No
8/31/17	29	127,405	311	$1,173	$19,473	No
10/2/17	32	145,889	421	$1,612	$23,165	No
11/1/17	30	127,346	392	$1,452	$16,891	No
Totals	**364**	**1,701,024**	**433**	**$16,884**	**$237,313**	
Annual	**365**	**1,705,697**	**433**	**$16,930**	**$237,965**	

Notes:

- Peak demand of 433 kW occurred in June 2017.
- The average electric cost over the past 12 months was $0.140/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.
- The demand (kW) is relatively constant year-round. The high winter demand is likely due to the use of heat pumps for heating in many locations coupled with electric resistance in other areas.

3.2 Natural Gas

Elizabethtown Gas delivers natural gas under rate class General Delivery - AMR, with natural gas supply provided by UGI Energy Services, a third-party supplier.



Gas Billing Data				
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**	**TRC Estimated Usage?**
12/1/16	29	2,041	$2,653	No
1/1/17	31	11,826	$7,960	No
2/1/17	31	5,367	$4,193	No
3/1/17	28	3,425	$3,612	No
4/1/17	31	4,739	$3,814	No
5/1/17	30	3,502	$3,295	No
6/1/17	31	1,952	$1,981	Yes
7/1/17	30	403	$1,091	No
8/1/17	31	320	$1,032	No
9/1/17	31	351	$1,133	Yes
10/1/17	30	382	$1,060	No
11/1/17	31	465	$1,119	No
Totals	**364**	**34,772**	**$32,944**	
Annual	**365**	**34,867**	**$33,034**	

Notes:

- The average gas cost for the past 12 months is $0.947/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 county, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

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

Benchmarking Score	14

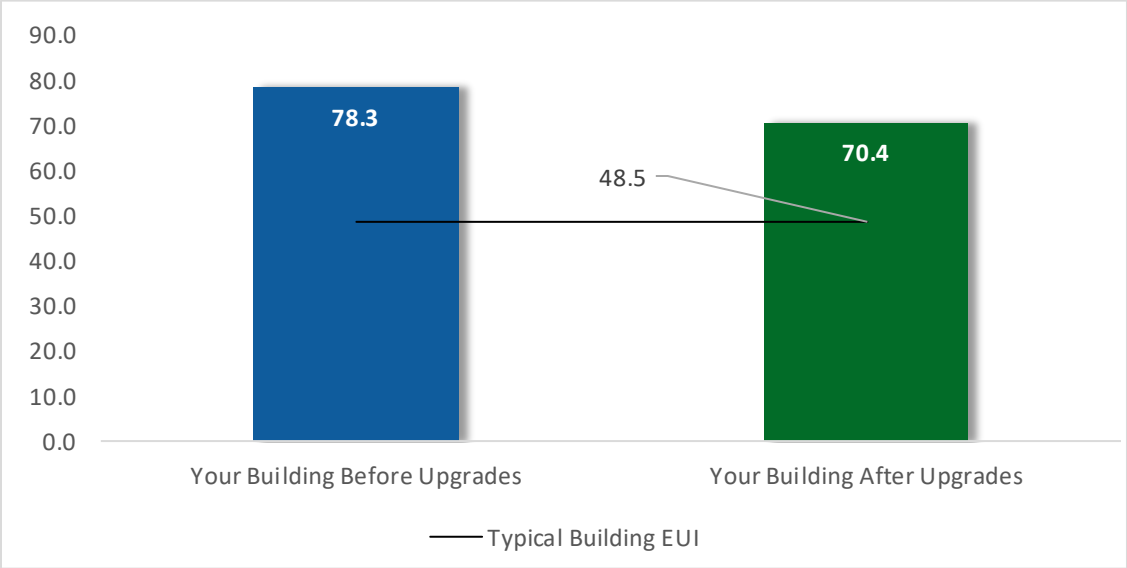


Figure 6 - Energy Use Intensity Comparison

This building performs at, or below 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. A number of 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 New Jersey Board of Public Utilities. 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.

#	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		**196,316**	**51.2**	**-38**	**$27,027**	**$77,348**	**$19,416**	**$57,932**	**2.1**	**193,225**
ECM 1	Install LED Fixtures	9,858	1.1	0	$1,375	$3,295	$510	$2,785	2.0	9,927
ECM 2	Retrofit Fixtures with LED Lamps	186,458	50.0	-38	$25,652	$74,053	$18,906	$55,147	2.1	183,298
Lighting Control Measures		**32,227**	**7.3**	**-7**	**$4,432**	**$27,360**	**$4,335**	**$23,025**	**5.2**	**31,663**
ECM 3	Install Occupancy Sensor Lighting Controls	20,609	5.0	-4	$2,834	$18,360	$2,310	$16,050	5.7	20,249
ECM 4	Install High/Low Lighting Controls	11,618	2.3	-2	$1,598	$9,000	$2,025	$6,975	4.4	11,414
Custom Measures		**41,999**	**0.0**	**60**	**$6,430**	**$35,681**	**$0**	**$35,681**	**5.5**	**49,346**
ECM 5	Retro-Commissioning Study & HVAC Improvements	41,999	0.0	60	$6,430	$35,681	$0	$35,681	5.5	49,346
TOTALS		**270,541**	**58.5**	**15**	**$37,890**	**$140,389**	**$23,751**	**$116,638**	**3.1**	**274,234**

* - 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		**196,316**	**51.2**	**-38**	**$27,027**	**$77,348**	**$19,416**	**$57,932**	**2.1**	**193,225**
ECM 1	Install LED Fixtures	9,858	1.1	0	$1,375	$3,295	$510	$2,785	2.0	9,927
ECM 2	Retrofit Fixtures with LED Lamps	186,458	50.0	-38	$25,652	$74,053	$18,906	$55,147	2.1	183,298
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ECM 3	Install Occupancy Sensor Lighting Controls	20,609	5.0	-4	$2,834	$18,360	$2,310	$16,050	5.7	20,249
ECM 4	Install High/Low Lighting Controls	11,618	2.3	-2	$1,598	$9,000	$2,025	$6,975	4.4	11,414
Custom Measures		**41,999**	**0.0**	**60**	**$6,430**	**$35,681**	**$0**	**$35,681**	**5.5**	**49,346**
ECM 5	Retro-Commissioning Study & HVAC Improvements	41,999	0.0	60	$6,430	$35,681	$0	$35,681	5.5	49,346
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* - 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		**196,316**	**51.2**	**-38**	**$27,027**	**$77,348**	**$19,416**	**$57,932**	**2.1**	**193,225**
ECM 1	Install LED Fixtures	9,858	1.1	0	$1,375	$3,295	$510	$2,785	2.0	9,927
ECM 2	Retrofit Fixtures with LED Lamps	186,458	50.0	-38	$25,652	$74,053	$18,906	$55,147	2.1	183,298

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 school, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

Replace existing exterior metal halide (MH) wall pack fixtures with new LED light fixtures. This measure saves energy by installing LEDs, which use less power than other technologies with a comparable light output.

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

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

Affected building areas: exterior wall pack fixtures.

ECM 2: Retrofit Fixtures with LED Lamps

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

This measure saves energy by installing LEDs, which use less power than other lighting technologies while providing 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 (T5 and T8), CFL, and incandescent fixtures.

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		**32,227**	**7.3**	**-7**	**$4,432**	**$27,360**	**$4,335**	**$23,025**	**5.2**	**31,663**
ECM 3	Install Occupancy Sensor Lighting Controls	20,609	5.0	-4	$2,834	$18,360	$2,310	$16,050	5.7	20,249
ECM 4	Install High/Low Lighting Controls	11,618	2.3	-2	$1,598	$9,000	$2,025	$6,975	4.4	11,414

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

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

Affected building areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms.

ECM 4: Install High/Low Lighting Controls

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

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

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

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

Affected building areas: hallways, basement garage.

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

4.3 Custom 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)
Custom Measures		**41,999**	**0.0**	**60**	**$6,430**	**$35,681**	**$0**	**$35,681**	**5.5**	**49,346**
ECM 5	Retro-Commissioning Study & HVAC Improvements	41,999	0.0	60	$6,430	$35,681	$0	$35,681	5.5	49,346

ECM 5: Retro-Commissioning Study & HVAC Improvements

Because of higher than expected energy use and high winter electrical demand (kW) at this site, we recommend that a retro-commissioning study be considered for this location.

Due to the complexity of today's HVAC systems and controls, it is likely for systems to be operating incorrectly or below their potential efficiency. Retro-commissioning studies reveal hidden deficiencies and highlights operational and maintenance (O&M) issues that could have been avoided, as well as expose hidden control system problems. There are valuable benefits to retro-commissioning in existing buildings. It is a detailed and specialized process that reviews how an HVAC system is controlled and designed to operate. Applying retro-commissioning to existing facilities includes planning, discovering root causes of inefficiencies, developing a cost-effective project delivery, and focusing on optimizing value to the building owner. The study includes functional system testing under various modes, such as heating or cooling loads, occupied and unoccupied modes, varying outside air temperature, and space temperatures. This is a systematic process to ensure that the building energy systems perform interactively according to the original design intent and the current operational needs of the school.

Retro-commissioning is a common practice recommended by the American Society of Heating Refrigeration and Energy (ASHRAE) to be revisited every couple of years. We recommend contacting an engineering firm who specializes in energy control systems and retro-commissioning for a detailed evaluation and implementation costs. Facility operations personnel would work with the engineers to develop goals and objectives. During on site testing, the qualified personnel conducting the study would immediately make any no/low-cost improvements as identified. Furthermore, for any suggested corrective actions which require the purchase of material, a contractor who specializes in that scope of work would be contacted to implement the remaining improvements.

This measure is an effort to increase the optimization of the EMS and operation of HVAC systems and equipment. We have identified this potential measure in response to the relatively low benchmarking scope and the relative complexity of the building systems.

Further analysis should be conducted for the feasibility of this measure. This is not an investment grade analysis nor should be used as a basis for design and construction. The results are based on industry standards.

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.

Weatherization

Caulk or weather strip leaky doors and windows to reduce drafts and loss of heated or cooled air. Sealing cracks and openings can reduce heating and cooling costs, improve building durability, and create a healthier indoor environment.

Doors and Windows

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

Lighting Maintenance

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

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

Lighting Controls

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

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

Motor Controls

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

Motor Short Cycling Reduction

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

Motor Maintenance

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

Thermostat Schedules and Temperature Resets

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

Economizer Maintenance

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

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

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.

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.

Computer Power Management Software

Many computers consume power during nights, weekends, and holidays. Screen savers are commonly confused as a power management strategy. This contributes to avoidable, excessive electrical energy consumption. There are innovative power management software packages available that are designed to deliver significant energy saving and provide ongoing tracking measurements. A central power management platform helps enforce energy savings policies as well as identify and eliminate underutilized devices

Water Conservation

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

For more information regarding water conservation go to the EPA's WaterSense™ website[5] or download a copy of EPA's "WaterSense™ at Work: Best Management Practices for Commercial and Institutional Facilities"[6] 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 school is unoccupied, and there is no other scheduled water usage.

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

Procurement Strategies

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

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

[6] 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 school's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

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

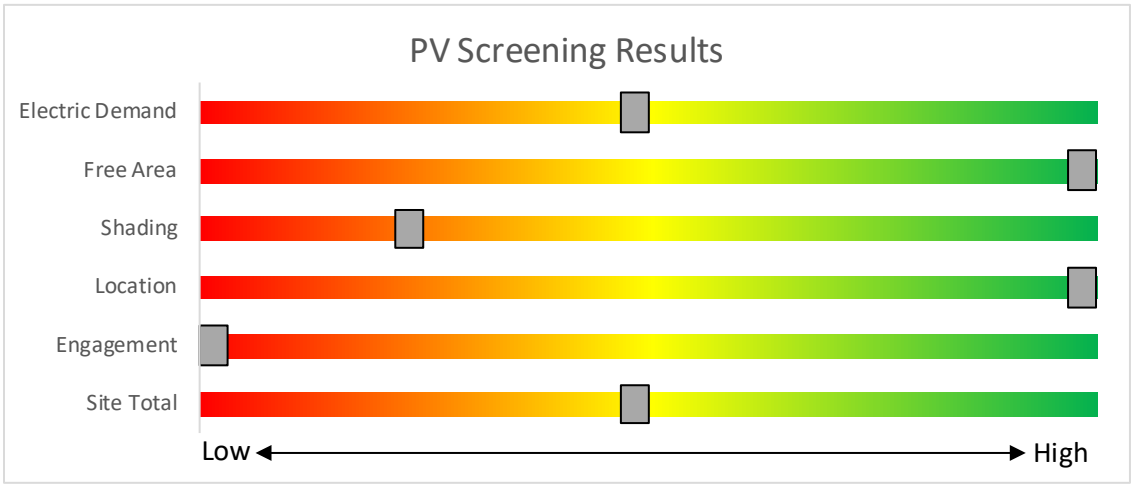
6.1 Solar Photovoltaic

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

A preliminary screening based on the school's electric demand, size and location of free area, and shading elements shows that the facility has **medium** potential for installing a PV array.

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

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



Potential	Medium	
System Potential	300	kW DC STC
Electric Generation	225,733	kWh/yr
Displaced Cost	$31,490	/yr
Installed Cost	$780,000	

Figure 9 - Photovoltaic Screening

Solar Renewable Energy Credit (SREC) Registration Program

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 New Jersey**: www.njcleanenergy.com/whysolar
- **New Jersey Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the New Jersey 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 school 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 school's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

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

Based on a preliminary analysis, the school 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.

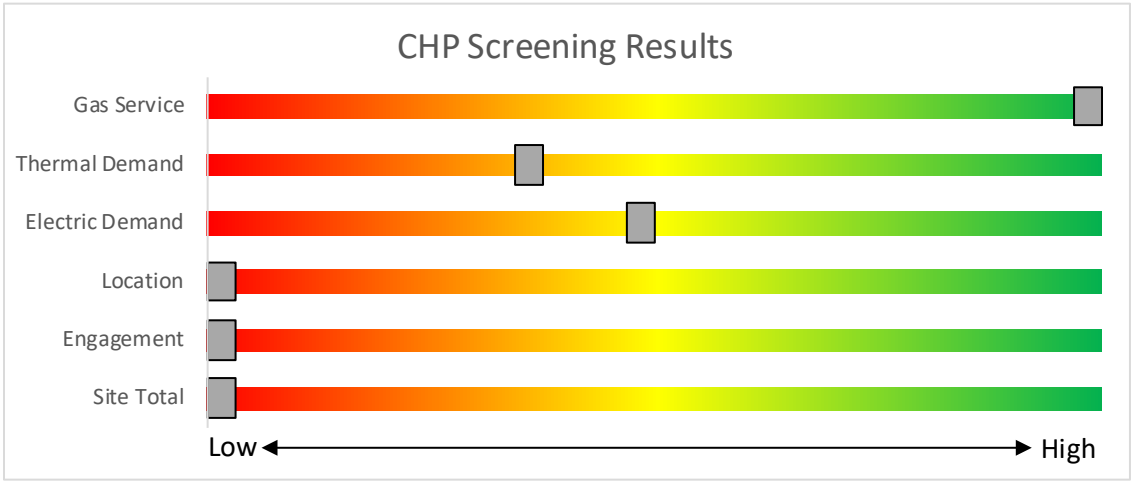


Figure 10 - Combined Heat and Power Screening

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

7 PROJECT FUNDING AND INCENTIVES

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

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

7.1 SmartStart

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

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy 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 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.

7.3 SREC Registration Program

The SREC 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[7].

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[8].

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

[8] 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	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.4	1,797	0	$247	$657	$180	1.9
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
Stairs	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.1	299	0	$41	$110	$30	1.9
Stairs	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
Exterior wall pack	27	Compact Fluorescent: 4-pin	Timeclock		42	4,360	2	Relamp	No	27	LED Lamps: LED lamps	Timeclock	29	4,360	0.2	1,483	0	$207	$465	$27	2.1
Exterior wall pack	17	Metal Halide: (1) 150W Lamp	Timeclock		190	4,360	1	Fixture Replacement	No	17	LED - Fixtures: Wall-Wash Lights	Timeclock	57	4,360	1.1	9,858	0	$1,375	$3,295	$510	2.0
Exterior recessed	18	Compact Fluorescent: 2-pin	Timeclock		36	4,360	2	Relamp	No	18	LED Lamps: LED lamps	Timeclock	25	4,360	0.1	848	0	$118	$310	$18	2.5
Exterior wall pack	33	Compact Fluorescent: 4-pin	Timeclock		42	4,360	2	Relamp	No	33	LED Lamps: LED lamps	Timeclock	29	4,360	0.2	1,813	0	$253	$568	$33	2.1
Kitchen	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.9	3,811	-1	$524	$1,365	$335	2.0
Kitchen	10	Compact Fluorescent: 4-pin	Wall Switch		42	2,750	2	Relamp	No	10	LED Lamps: LED lamps	Wall Switch	29	2,750	0.1	381	0	$52	$172	$10	3.1
Kitchen	10	Linear Fluorescent - T5HO: 4' T5HO (54W) - 1L	Wall Switch		62	2,750	2	Relamp	No	10	LED - Linear Tubes: (1) 4' T5HO (25W) Lamp	Wall Switch	26	2,750	0.3	1,104	0	$152	$328	$0	2.2
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	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	100	0	$14	$37	$10	1.9
Kitchen office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.0	103	0	$14	$55	$15	2.8
Kitchen restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.0	103	0	$14	$55	$15	2.8
Kitchen storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	300	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	300	0.1	49	0	$7	$164	$45	17.7
Main gym	30	Compact Fluorescent: 4-pin(4 lamps, 40watts each)	Wall Switch		160	2,750	2, 3	Relamp	Yes	30	LED Lamps: LED lamps	Occupancy Sensor	112	1,898	1.8	7,507	-2	$1,032	$1,327	$135	1.2
Main gym	4	Compact Fluorescent: 4-pin(4 lamps, 40watts each)	Wall Switch		160	2,750	2, 3	Relamp	Yes	4	LED Lamps: LED lamps	Occupancy Sensor	112	1,898	0.2	1,001	0	$138	$69	$4	0.5
Room 106 boys locker room	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.4	1,778	0	$245	$781	$175	2.5
Room 106 boys locker 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
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	572	0	$79	$434	$80	4.5
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	100	0	$14	$37	$10	1.9
Room 103 girls locker room	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.4	1,778	0	$245	$781	$175	2.5
Room 103	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
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Storgae room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.3	131	0	$18	$438	$120	17.7
Small Gym	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	200	0	$27	$73	$20	1.9
Small Gym	12	Compact Fluorescent: 4-pin	Wall Switch		40	2,750	2, 3	Relamp	Yes	12	LED Lamps: LED lamps	Occupancy Sensor	28	1,898	0.2	751	0	$103	$477	$47	4.2
Small Gym	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 106A Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.1	44	0	$6	$146	$40	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	100	0	$14	$37	$10	1.9
Room 165	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,715	0	$236	$763	$170	2.5
Cafeteria	12	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2, 3	Relamp	Yes	12	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.2	976	0	$134	$477	$47	3.2
Cafeteria	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
Cafeteria	43	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	43	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	2.0	8,193	-2	$1,127	$3,165	$750	2.1
Storage	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	300	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	207	0.5	249	0	$34	$1,197	$180	29.7
Storage	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 167A Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	22	0	$3	$73	$20	17.7
Cafeteria	47	Halogen Incandescent: P38	Wall Switch		90	2,750	2, 3	Relamp	Yes	47	LED Lamps: LED lamps	Occupancy Sensor	14	1,898	2.7	11,471	-2	$1,578	$2,495	$152	1.5
Main office	5	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2, 3	Relamp	Yes	5	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.1	407	0	$56	$356	$40	5.7
Main office	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,715	0	$236	$763	$170	2.5
Main office	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 130E	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	200	0	$27	$73	$20	1.9
Room 130C	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 131A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	381	0	$52	$380	$65	6.0
Room 131	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8
Principal office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	572	0	$79	$434	$80	4.5
Principal office	8	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2, 3	Relamp	Yes	8	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.2	651	0	$89	$408	$43	4.1
Room 130A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	381	0	$52	$380	$65	6.0

	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
Main lobby	31	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2, 3	Relamp	Yes	31	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.6	2,521	-1	$347	$1,074	$101	2.8
Main lobby	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Cafeteria hallway	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,898	0.1	508	0	$70	$371	$40	4.7
Cafeteria hallway	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,898	0.3	1,143	0	$157	$554	$90	2.9
Cafeteria 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
Room 110	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	276	0	$38	$146	$40	2.8
Room 112	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Custodian Hall	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,898	0.2	1,016	0	$140	$517	$80	3.1
Custodian Hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 117	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	207	0	$28	$110	$30	2.8
Room 115	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	381	0	$52	$380	$65	6.0
Room 115	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,750	0.0	150	0	$21	$55	$15	1.9
Room 116	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	100	0	$14	$37	$10	1.9
Room 114	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Hall display	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	100	0	$14	$37	$10	1.9
1st main hall	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 4	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,898	0.2	889	0	$122	$481	$70	3.4
1st main hall	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 main hall	5	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2, 4	Relamp	Yes	5	LED Lamps: LED lamps	High/Low Control	36	1,898	0.1	407	0	$56	$311	$5	5.5
1st main hall	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,750	0.0	150	0	$21	$55	$15	1.9
Room 133	6	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2, 3	Relamp	Yes	6	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.1	488	0	$67	$373	$41	5.0
Room 133	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,750	0.0	150	0	$21	$55	$15	1.9
Room 133G	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	381	0	$52	$380	$65	6.0
Room 133C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	381	0	$52	$380	$65	6.0
Room 133A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	381	0	$52	$380	$65	6.0
Room 133E	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.2	762	0	$105	$489	$95	3.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 133D	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	381	0	$52	$380	$65	6.0
Room 164	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Room 164	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Room 163	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 162	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Room 162	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Pre-K hall	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 4	Relamp	Yes	27	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,898	0.8	3,430	-1	$472	$1,886	$270	3.4
Pre-K hall	4	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2, 4	Relamp	Yes	4	LED Lamps: LED lamps	High/Low Control	36	1,898	0.1	325	0	$45	$294	$4	6.5
Room 148	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	207	0	$28	$110	$30	2.8
Room 147	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	22	0	$3	$73	$20	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	100	0	$14	$37	$10	1.9
Room 146	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Room 149	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Room 145	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	22	0	$3	$73	$20	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	100	0	$14	$37	$10	1.9
Room 144	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Room 144 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	22	0	$3	$73	$20	17.7
Room 144 restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 100	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.5	1,905	0	$262	$818	$185	2.4
Room 110	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	100	0	$14	$37	$10	1.9
Room 151	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.5	2,286	0	$314	$927	$215	2.3
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	11	0	$1	$37	$10	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 152	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Room 143	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Room 153	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storagre	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	11	0	$1	$37	$10	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 142	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	11	0	$1	$37	$10	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 141	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	11	0	$1	$37	$10	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 154	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	11	0	$1	$37	$10	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 140	1	Compact Fluorescent: 4-pin	Occupancy Sensor		52	1,898	2	Relamp	No	1	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.0	33	0	$4	$17	$1	3.6
Room 155	1	Compact Fluorescent: 4-pin	Occupancy Sensor		52	1,898	2	Relamp	No	1	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.0	33	0	$4	$17	$1	3.6
Room 134	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Room 139	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	11	0	$1	$37	$10	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 146	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	11	0	$1	$37	$10	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 138	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	22	0	$3	$73	$20	17.7

	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
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 137	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Room 136	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	300	0.0	11	0	$1	$37	$10	17.7
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 161	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.5	2,286	0	$314	$927	$215	2.3
Stairwell 3	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	13	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.3	1,298	0	$178	$475	$130	1.9
Stairwell 3	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
2nd floor hall	37	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 4	Relamp	Yes	37	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,898	1.1	4,700	-1	$646	$2,701	$370	3.6
2nd floor hall	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
2nd floor hall	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,750	0.0	150	0	$21	$55	$15	1.9
2nd floor hall	2	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	2	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	94	0	$13	$34	$2	2.5
Room 228	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	572	0	$79	$434	$80	4.5
Room 227	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8
Room 226	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 226	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	827	0	$114	$438	$120	2.8
Room 229	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Room 225	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 225	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 224	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8
Room 230	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 231	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 231	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 223	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8
Room 222	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 222	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.2	620	0	$85	$329	$90	2.8
Room 221	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 221	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.0	103	0	$14	$55	$15	2.8
Room 233	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 220	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8
Room 234	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 234	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 219	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8
Room 235	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	827	0	$114	$438	$120	2.8
Room 218	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 218	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 217	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 217	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Boys restroom	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Boys restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		52	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	387	0	$53	$416	$75	6.4
Room 237	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Girls restroom	1	Compact Fluorescent: 4-pin	Occupancy Sensor		52	1,898	2	Relamp	No	1	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.0	33	0	$4	$17	$1	3.6
Girls restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	276	0	$38	$146	$40	2.8
Room 216	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8
Room 239	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	827	0	$114	$438	$120	2.8
Room 215	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	827	0	$114	$438	$120	2.8
Room 240	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 240	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 241	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Room 242	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 213	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.2	620	0	$85	$329	$90	2.8
Room 212	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.2	620	0	$85	$329	$90	2.8
Room 243	7	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2, 3	Relamp	Yes	7	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.1	569	0	$78	$391	$42	4.5
Room 243A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	207	0	$28	$110	$30	2.8
Room 243F	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	207	0	$28	$110	$30	2.8
Room 243E	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	207	0	$28	$110	$30	2.8
Room 243B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	207	0	$28	$110	$30	2.8
Room 243D	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	207	0	$28	$110	$30	2.8
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	300	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	300	0.0	11	0	$1	$37	$10	17.7
Room 211	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	276	0	$38	$146	$40	2.8
Room 248	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 245	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	276	0	$38	$146	$40	2.8
Room 247	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 246	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.2	762	0	$105	$489	$95	3.8
Room 210	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 209	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 249	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Library	8	Compact Fluorescent: 4-pin	Occupancy Sensor		52	1,898	2	Relamp	No	8	LED Lamps: LED lamps	Occupancy Sensor	36	1,898	0.1	260	0	$36	$138	$8	3.6
Library	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.6	2,667	-1	$367	$1,037	$245	2.2
Library	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 204	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.9	3,811	-1	$524	$1,635	$370	2.4
Room 205	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.5	1,905	0	$262	$818	$185	2.4
Room 206	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.4	1,524	0	$210	$708	$155	2.6
Room 207	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	413	0	$57	$219	$60	2.8
Room 208	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 207	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	207	0	$28	$110	$30	2.8
Room203	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.2	762	0	$105	$489	$95	3.8
3rd film hallway	38	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 4	Relamp	Yes	38	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,898	1.1	4,827	-1	$664	$2,738	$380	3.6
3rd film 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
Room 318	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	310	0	$43	$164	$45	2.8
Room 317	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Stairwell 4	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.3	1,098	0	$151	$402	$110	1.9
Stairwell 4	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Room 316	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 319	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 320	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 315	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 314	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 321	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 322	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 323	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	827	0	$114	$438	$120	2.8
Room 323	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Room 313	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 312	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.2	723	0	$99	$383	$105	2.8
Boys restroom	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Boys restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Room 325	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8
Girls restroom	1	Compact Fluorescent: 4-pin	Wall Switch		52	2,750	2	Relamp	No	1	LED Lamps: LED lamps	Wall Switch	36	2,750	0.0	47	0	$6	$17	$1	2.5
Girls restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Room 327	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	69	0	$9	$37	$10	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 327	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	827	0	$114	$438	$120	2.8
Room 328	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	827	0	$114	$438	$120	2.8
Room 311	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.3	930	0	$128	$493	$135	2.8
Room 309	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.0	103	0	$14	$55	$15	2.8
Common Area	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.2	762	0	$105	$489	$95	3.8
Room 329	44	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	44	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	1.3	5,589	-1	$769	$2,417	$545	2.4
Room 329	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 330	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	200	0	$27	$73	$20	1.9
Room 331	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Room 332	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	276	0	$38	$146	$40	2.8
Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	300	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	300	0.1	65	0	$9	$219	$60	17.7
Room 333	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Rooom 307	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.5	1,550	0	$213	$822	$225	2.8
Rooom 307	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 334	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Room 335	49	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	49	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	1.5	6,224	-1	$856	$2,599	$595	2.3
Room 335	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 335 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	300	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	300	0.1	33	0	$4	$110	$30	17.7
Room 306	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.2	953	0	$131	$544	$110	3.3
Room 336	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Room 305	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.5	1,550	0	$213	$822	$225	2.8
Room 305	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Room 305	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Room 337 restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.0	138	0	$19	$73	$20	2.8
Room 304	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.4	1,240	0	$171	$657	$180	2.8

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 303	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	1,898	2	Relamp	No	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.8	2,204	0	$303	$1,168	$320	2.8
Room 303	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 303B	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor		93	1,898	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.0	103	0	$14	$55	$15	2.8
Room 303C	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	572	0	$79	$434	$80	4.5
Room 302	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch		93	2,750	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,898	0.1	572	0	$79	$434	$80	4.5
Stairwell 2	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.3	1,098	0	$151	$402	$110	1.9
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
Room 006	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Basement garage	216	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Timeclock		62	3,640	2, 4	Relamp	Yes	216	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,512	6.5	36,316	-8	$4,995	$11,937	$4,185	1.6
Basement garage	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
Room B 007	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Room B 004	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,750	0.0	200	0	$27	$73	$20	1.9
Room B 002	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.2	762	0	$105	$489	$95	3.8
Room B 001	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.1	508	0	$70	$416	$75	4.9
Room B 003	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	2,750	2, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,898	0.2	1,016	0	$140	$562	$115	3.2

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	Kitchen - MAU-1	1	Ventilation Fan	5.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Kitchen (HRU9)	1	Ventilation Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU4)	1	Ventilation Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU1)	1	Ventilation Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU7)	1	Ventilation Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU5)	1	Ventilation Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU2)	1	Ventilation Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU6)	1	Ventilation Fan	5.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU10)	1	Ventilation Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU3)	1	Ventilation Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU8)	1	Ventilation Fan	5.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Kitchen (HRU9)	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU4)	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU1)	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU7)	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU5)	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU2)	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU7)	1	Exhaust Fan	3.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU10)	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classroom (HRU3)	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	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	Classroom (HRU8)	1	Exhaust Fan	3.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Cafeteria (RTU3,RTU4)	2	Supply Fan	7.5	91.0%	No	W	3,000		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Gym (RTU1,RTU2)	2	Supply Fan	7.5	91.0%	No	W	3,000		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Cafeteria (RTU3,RTU4)	2	Return Fan	3.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Gym (RTU1,RTU2)	2	Return Fan	3.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	HP Loop (CTP-1,CTP-2)	2	Condenser Water Pump	15.0	93.0%	No	W	3,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	HHW Loop	2	Heating Hot Water Pump	30.0	94.1%	Yes	W	1,000		No	94.1%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	Water Treatment	1	Process Pump	1.0	85.5%	No	W	3,000		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	Kitchen	1	Exhaust Fan	0.3	70.0%	No	W	3,000		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Kitchen	Kitchen	1	Kitchen Hood Exhaust Fan	0.5	70.0%	No	W	3,000		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	Kitchen Hood	1	Exhaust Fan	2.0	86.5%	No	W	3,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	Teacher Cafeteria	1	Exhaust Fan	0.3	70.0%	No	W	3,000		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	Boiler Rm	1	Exhaust Fan	0.3	70.0%	No	W	3,000		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	Restroom	1	Exhaust Fan	0.3	70.0%	No	W	3,000		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Rm	Restroom	1	Exhaust Fan	0.1	70.0%	No	W	3,000		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Cooling Tower	1	Cooling Tower Fan	30.0	93.6%	No	W	1,500		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
Custodian Hall	DHW Booster Pump	1	Process Pump	0.2	70.0%	No	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Rm B001	Building	2	Water Supply Pump	5.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Rm B001	DHW Booster Pump	2	Process Pump	0.2	70.0%	No	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Various	50	Supply Fan	3.0	89.5%	No	W	3,000		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

Fuel Heating Inventory & Recommendations

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
Hallway	Kitchen	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Rm B001	School	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof/Kitchen	1	Medium Temp Freezer (0F to 30F)		No	No	No	0.0	0	0	$0	$0	$0	0.0
Roof/Kitchen	1	Cooler (35F to 55F)		No	No	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
Kitchen	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Refrigerator Chest	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Freezer, Solid Door (16 - 30 cu. ft.)	No		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	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
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/0!
Kitchen	1	Gas Convection Oven (Full Size)	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/0!
Kitchen	1	Gas Convection Oven (Full Size)	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/0!
Kitchen	1	Gas Steamer	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/0!
Kitchen	1	Gas Steamer	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/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?
Building	79	Computer	120.0	
Building	68	Printers	30.0	
Building	21	Small Refrigerator	30.0	
Building	5	Refrigerator	500.0	
Building	24	Microwave	1,200.0	
Building	6	Coffee Machine	1,200.0	
Building	3	Toaster	1,200.0	
Building	3	Copy Machine	515.0	
Building	1	Water Cooler	500.0	
Building	1	Elec Range	2,000.0	

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.

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ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Dr. Antonia Pantoja Elementary School (27)

Primary Property Type: K-12 School
Gross Floor Area (ft²): 118,806
Built: 2008

For Year Ending: October 31, 2017
Date Generated: February 25, 2019

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Dr. Antonia Pantoja Elementary School (27) 505-517 Morris Avenue Elizabeth, New Jersey 07208	Elizabeth Board of Education 500 North Broad Street Elizabeth, NJ 07208 908-436-5180	Luis Couto 500 North Broad Street Elizabeth, NJ 07208 908-436-5180 coutolu@epsnj.org

Property ID: 6688953

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
78.1 kBtu/ft²

Source EUI
167.5 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	5,803,894 (62%)
Natural Gas (kBtu)	3,477,190 (38%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	52.2
National Median Source EUI (kBtu/ft²)	112
% Diff from National Median Source EUI	50%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	773

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

___ _____
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(___)___-_____
_____

Professional Engineer Stamp (if applicable)

APPENDIX C: GLOSSARY

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

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

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