Local Government Energy Audit Report

New Elliot Elementary School

August 26, 2019

Prepared for:

Newark Public Schools
721 Summer Avenue
Newark, New Jersey 07104

Prepared by:

TRC Energy Services
900 Route 9 North
Woodbridge, New Jersey 07095

Disclaimer

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

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

TRC bases estimated installation costs on our experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from RS Means. We encourage the owner of the facility to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on individual measures and conditions. TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

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

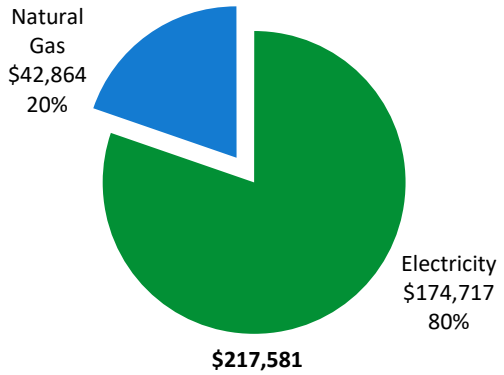
The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state and federal requirements.

Table of Contents

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for New Elliot Elementary School. This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in the Elementary School. 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: $217,581 Electricity: 1,166,908 kWh Natural Gas: 49,454 Therms	
ENERGY STAR® Benchmarking Score	47 *(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.

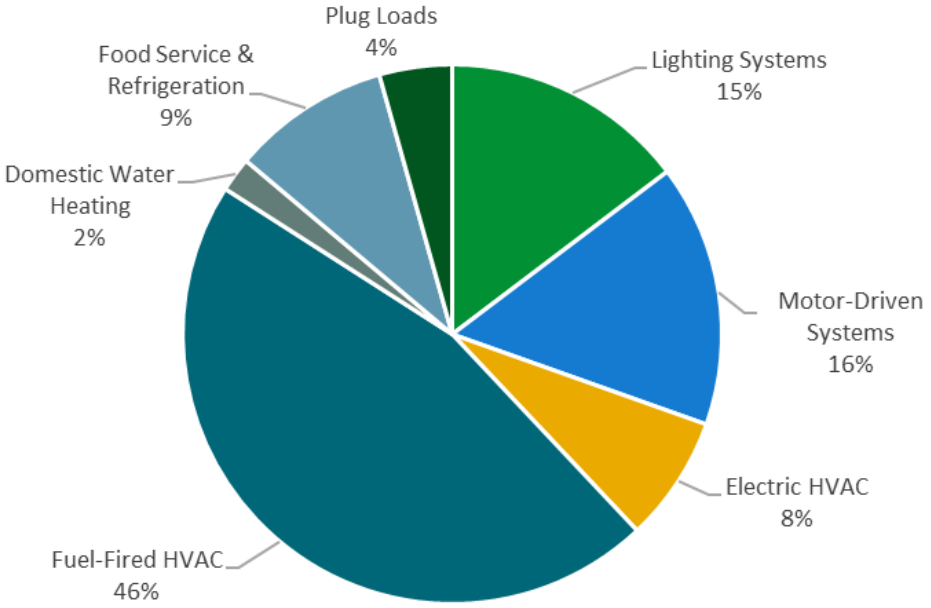


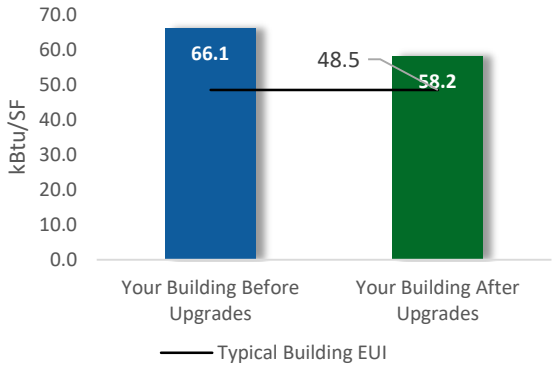
Figure 1 - Energy Use by System

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.

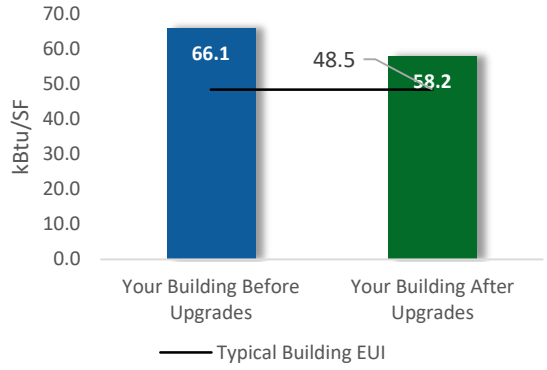
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$135,421
Potential Rebates & Incentives[1]	$19,752
Annual Cost Savings	$41,242
Annual Energy Savings	Electricity: 265,999 kWh Natural Gas: 1,632 Therms
Greenhouse Gas Emission Savings	143 Tons
Simple Payback	2.8 Years
Site Energy Savings (all utilities)	12%



Scenario 2: Cost Effective Package[2]

Installation Cost	$135,421
Potential Rebates & Incentives	$19,752
Annual Cost Savings	$41,242
Annual Energy Savings	Electricity: 265,999 kWh Natural Gas: 1,632 Therms
Greenhouse Gas Emission Savings	143 Tons
Simple Payback	2.8 Years
Site Energy Savings (all utilities)	12%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Lifetime Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**213,387**	**48.3**	**-44**	**$31,565**	**$473,475**	**$82,871**	**$19,562**	**$63,309**	**2.0**	**209,681**
ECM 1	Retrofit Fixtures with LED Lamps	213,387	48.3	-44	$31,565	$473,475	$82,871	$19,562	$63,309	2.0	209,681
Lighting Control Measures		**13,799**	**1.5**	**-3**	**$2,041**	**$16,329**	**$7,020**	**$140**	**$6,880**	**3.4**	**13,558**
ECM 2	Install Occupancy Sensor Lighting Controls	6,229	0.8	-1	$921	$7,370	$1,620	$140	$1,480	1.6	6,120
ECM 3	Install High/Low Lighting Controls	7,571	0.7	-2	$1,120	$8,959	$5,400	$0	$5,400	4.8	7,438
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$241**	**$1,207**	**$230**	**$50**	**$180**	**0.7**	**1,623**
ECM 4	Vending Machine Control	1,612	0.2	0	$241	$1,207	$230	$50	$180	0.7	1,623
Custom Measures		**37,200**	**0.0**	**210**	**$7,394**	**$36,971**	**$45,300**	**$0**	**$45,300**	**6.1**	**62,104**
ECM 5	Computer Power Management Software	6,029	0.0	0	$903	$4,514	$4,300	$0	$4,300	4.8	6,071
ECM 6	Retro-Commissioning Study & HVAC Improvements	31,171	0.0	210	$6,491	$32,456.92	$41,000	$0	$41,000	6.3	56,033
TOTALS (COST EFFECTIVE MEASURES)		**265,999**	**50.0**	**163**	**$41,242**	**$527,981**	**$135,421**	**$19,752**	**$115,669**	**2.8**	**286,966**
TOTALS (ALL MEASURES)		**265,999**	**50.0**	**163**	**$41,242**	**$527,981**	**$135,421**	**$19,752**	**$115,669**	**2.8**	**286,966**

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

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

Figure 2 – Evaluated Energy Improvements

1.1 Planning Your Project

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

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

Pick Your Installation Approach

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

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

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Retrofit Fixtures with LED Lamps	x		
ECM 2	Install Occupancy Sensor Lighting Controls	x		
ECM 3	Install High/Low Lighting Controls			
ECM 4	Vending Machine Control	x		
ECM 5	Computer Power Management Software			
ECM 6	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 New Elliot Elementary School. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC 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.

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

2.1 Site Overview

On January 16, 2019, TRC performed an energy audit at New Elliot Elementary School located in Newark, New Jersey. TRC met with Aaron Gonzalez to review the Elementary School operations and help focus our investigation on specific energy-using systems.

New Elliot Elementary School is a three-story, 135,000 square foot building built in 2015. Spaces include: classrooms, a gymnasium, an auditorium, a library, offices, a cafeteria, a kitchen, corridors, stairwells, and mechanical space. The building is 100% heated and cooled. There is a hot water system, chilled water system, roof top units (RTUs), energy recovery units (ERUs), a heating-ventilation (HV) unit, a make-up air (MUA) unit, fan coil units (FCUs), and split air-conditioning (AC) systems. All major HVAC equipment and systems are controlled by the building energy management system (BMS).

Facility concerns include the connectivity and functionality of the existing energy management system is a concern. Facility staff also reported that due to an update with internet service, there was a disruption in access to the building energy management system. We recommend investigating this further and pursue re-instating access so proper energy management may be conducted. Another maintenance concern was the lack of LED stock for lighting fixtures in the cafeteria. Some fixtures were reported to have already burnt out. We recommend referring to the lighting fixture schedule in the as-built drawings for details.

2.2 Building Occupancy

The Elementary School is occupied year-round. Typical weekday occupancy is 66 staff and 748 students. Building occupancy also includes continuing custodial and maintenance activities. The sites used by the Newark Public School District for summer school varies on an annual basis. It should be noted that the energy and economic analysis for this building is based on the use of the building during the utility billing period, and that results will vary based on changes to building use patterns. This building is newer and a likely candidate for continued use for summer school.

Occupancy	Weekday/Weekend	Operating Schedule
Normal School Day	Weekday	7:30AM - 3:00PM
	Weekend (Saturday)	7:30AM - 3:00PM
After Hours Cleaning	Weekday	3:00PM - 11:00PM
	Weekend	No Use
Summer School	Weekday	7:30AM - 3:00PM
	Weekend (Saturday)	7:30AM - 3:00PM

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a brick or concrete masonry unit (CMU) facade. The roof is flat and covered with a rubber membrane. The roof is in good condition. Windows are double-pane and operable with metal frames. Windows are in good condition, as are the glass-to-frame seals and operable window weather seals. Exterior doors are metal with metal frames. The main entrance has steel framed glass window pane doors. Doors are in good condition and properly weather-stripped.

Building Facade

Building façade

2.4 Lighting Systems

The primary interior lighting system 2-foot 17-Watt and 4-foot 32-Watt linear fluorescent T8 lamps. There are also several compact fluorescent lamp (CFL) fixtures and U-lamp T8 fixtures. There are LED fixtures in the lobby/entrance, faculty dining room, and cafeteria. There are specialty halogen incandescent lamp fixtures in the auditorium. The dance room and gymnasium are lit by 6-lamp T8 high bay fixtures. All fluorescent lamp fixtures use electronic ballasts.

Fixtures throughout the building include recessed troffer fixtures, continuous row pendant fixtures, and recessed can fixtures. Light fixtures are in good condition. All exit signs throughout the building are LED. All interior lighting levels were generally sufficient. The majority of interior light fixtures are controlled by occupancy based sensors, while light fixtures are manually controlled via wall switches. The hallway fixtures are controlled by a wall switch located in the main office.

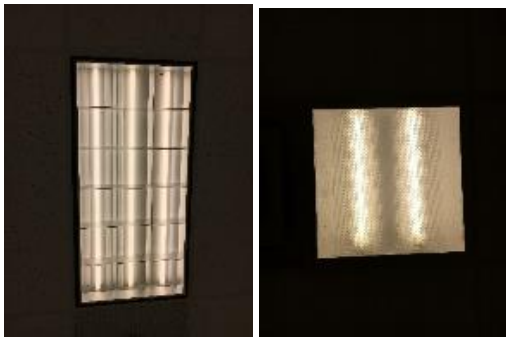
LED Lay in Troffer Fixtures

Linear Fluorescent T8 Troffer Fixtures

CFL Plug in Lamp Fixture

Linear Fluorescent T8 Pendant-mounted Fixtures

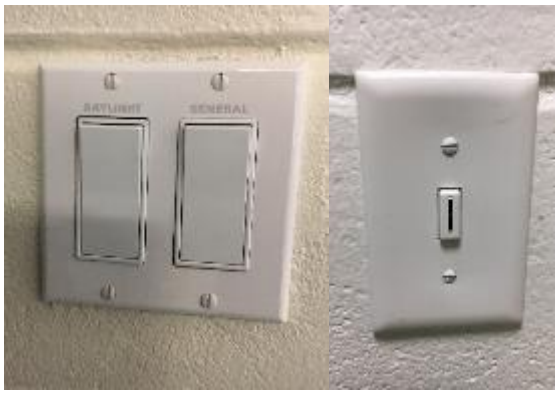
LED Strip Fixtures in Cafeteria



Linear Fluorescent T8 Troffer Fixtures

T8 Pendant-mounted Lighting

T8 High Bay Lighting in Gym



Bi Level Switching and Key Switch

Ceiling-mounted and Wall Switch Occupancy Sensor

Exterior fixtures include LED wall pack fixtures. There are also a few recessed can fixtures with CFLs under the canopies. Exterior light fixtures are controlled by a time clock. Exterior light fixtures and controls are in good condition.

Exterior LED Wall Pack Fixture

Exterior LED Wall Pack Fixtures

2.5 Air Handling Systems

Unitary Electric HVAC

There are electric unit heaters and cabinet heaters located in stairwells, vestibules, and mechanical and storage rooms. These typically have a 5kW heating element, and are controlled by manual dial thermostats. They are in good condition. There are split AC systems which serve server rooms. They are on average 1-ton in cooling capacity, and are high-efficiency and in good condition.

Split AC Systems

There are fan coil units which serve a majority of classrooms on the 1st, 2nd, and 3rd floor of the building. These fan coil units are equipped with a constant speed supply fan, chilled water coil, and hot water coil. Outdoor air is provided by one of the energy recovery units, and each unit is tied to a local thermostat that monitors space temperatures.

Fan Coil Unit

Energy Recovery Units

There are four energy recovery units (ERUs) controlled by the building energy management system (EMS). These units are equipped with an energy recovery wheel. Each unit is gas-fired for heating with a DX coil for cooling. They are high-efficiency units with energy efficiency ratios (EERs) ranging between 12.2 to 14.0 and heating efficiency of 81%. The supply fan and exhaust fan in each unit are driven by VFD-controlled motors. These are high-efficiency systems and in good condition. These ERUs bring in outdoor air for the three floors of the building and utilize the exhaust air to pre-condition the incoming fresh air to the school. A summary of these packaged units are as follows:

Equipment		Area Served	Cooling Capacity (tons)	Heating Capacity (Mbh)
Energy Recovery Units	ERU-1	School	10	168
	ERU-2	School	50	864
	ERU-3	School	50	864
	ERU-4	School	15	316

Energy Recovery Unit

Energy Recovery Units

Roof Top Units

The larger areas in the building are conditioned by roof top units (RTUs). There are eight units, and each is gas-fired for heating with a DX coil for cooling. They are standard-efficiency units with energy efficiency ratios (EER) of 9.7 and heating efficiencies of 81%. These units are equipped with economizers, which are in good condition. These RTUs provide ventilation to the offices, media center, gym, multi-purpose room, cafeteria, and kitchen. They are equipped with variable frequency drives (VFD) to control supply and exhaust fans and provide demand control ventilation. The RTUs are controlled by the building energy management system (EMS). A summary of these packaged units are as follows:

Equipment		Area Served	Cooling Capacity (tons)	Heating Capacity (Mbh)
Roof Top Units	RTU A103	Administration (VAV)	30	284
	RTU A200	Media Center	20	324
	RTU C207	Gym	20	324
	RTU C207A	Gym	20	324
	RTU C116	Multi-Purpose Room	40	284
	RTU C116A	Multi-Purpose Room	20	324
	RTU C107	Cafeteria	30	486
	RTU C108	Kitchen	17.5	284

Roof Top Unit

Roof Top Units

Make Up Air Unit

The kitchen is served by a make-up air unit (MUA) and kitchen exhaust fans, which are controlled by the building energy management system (EMS). The MUA brings in 100% outdoor air for the kitchen. Equipment is in good condition.

Kitchen Exhaust

Make Up Air Unit

2.6 Heating Hot Water System

Three Aerco model BMK 1000, 960 Mbh condensing hot water boilers serve the building heating load. The burners are fully-modulating with nominal efficiency of 96%. The boilers are configured in an automated control scheme. Installed in 2015, they are in good condition.

The hydronic distribution system is a 2-pipe, heating-only system. Seasonal changeover begins when the outdoor air temperature is below 65°F for the heating season. At the time of the audit, the outdoor air temperature was reported at 30.5°F, the supply water temperature at 173.5°F, and the return water temperature at 154.1°F. At this time, two boilers and one hot water pump were operating, and the VFD signal reported at 94% speed. The hydronic heating system is controlled by the EMS, and the supply water temperature is reset based on the outdoor air temperature.

The boilers serve a primary/secondary distribution system with two 3 hp and three 1 hp heating hot water pumps; they are all VFD-controlled and operating in an automated control scheme. A three-way valve controls the secondary loop temperature via the EMS. The boilers provide hot water to fin tube radiators and fan coil units throughout the building. Hot water pipes are insulated, and the insulation is in good condition.

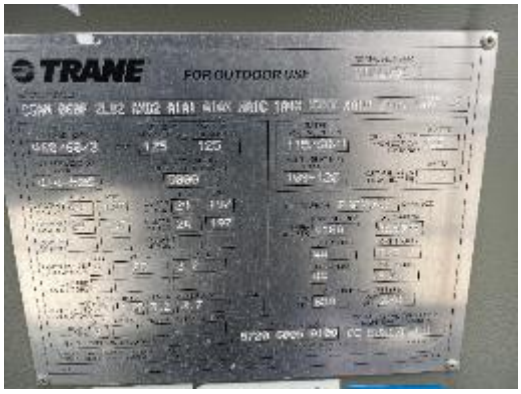
Hot Water Boilers

Hot Water Pump and Motor

2.7 Chilled Water Systems

The chiller plant consists of a two 60-ton, Trane, air-cooled scroll chillers. The chillers are configured in a primary distribution loop with three 5 hp variable flow chilled water pumps. The chilled water supply temperature is reset based on outside air temperature. The system is enabled when the outdoor air temperature is above 80°F for the cooling season. The chiller plant supplies chilled water to fan coil units throughout the building. The chillers are configured in an automated control scheme. Installed in 2015, they are in good condition.

Chillers



Chiller Nameplate

Chilled Water Pumps and Motors

Variable Frequency Drives

2.8 Building Energy Management Systems (EMS)

A Johnson Controls Metasys® EMS is wired to control the major HVAC systems and equipment. This includes the boilers, chillers, air handlers, and package units. The EMS provides equipment scheduling control and control for space temperatures, supply air temperatures, outside air damper positions, heating water loop temperatures, and chilled water loop temperatures. The controls system allowed for manual adjustments of these temperatures to account for local heating and cooling issues. However, this EMS is currently said to be inaccessible to facility personnel. The connectivity and functionality of the existing energy management system is a concern. Facility staff reported that due to an update with internet service, there was a disruption in access to the building energy management system. We recommend investigating this further and pursue re-instating access so proper energy management may be conducted.

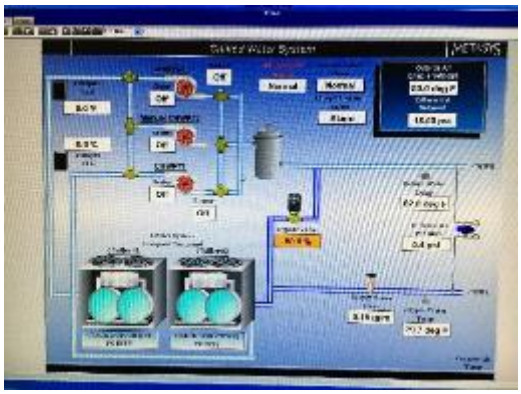
The schedule for the roof top units are summarized in the table below. It appears that the media center and multi-purpose room were manually switched to occupied mode all-day on Sundays and never adjusted back to actual building use. We recommend investigating possible operational changes within the EMS to potentially save significant energy at no or low cost.

Equipment		Area Served	Monday – Friday	Saturday	Sunday
Roof Top Units	RTU A103	Administration (VAV)	6AM – 8PM	6AM – 2PM	4AM – 5PM
	RTU A200	Media Center	6AM – 8PM	Unoccupied	12AM – 12PM
	RTU C207	Gym	6AM – 8PM	Unoccupied	Unoccupied
	RTU C207A	Gym	6AM – 8PM	Unoccupied	Unoccupied
	RTU C116	Multi-Purpose Room	6AM – 8PM	Unoccupied	12AM – 12PM
	RTU C116A	Multi-Purpose Room	6AM – 8PM	Unoccupied	12AM – 12PM
	RTU C107	Cafeteria	6AM – 8PM	Unoccupied	Unoccupied
	RTU C108	Kitchen	6AM – 8PM	Unoccupied	Unoccupied

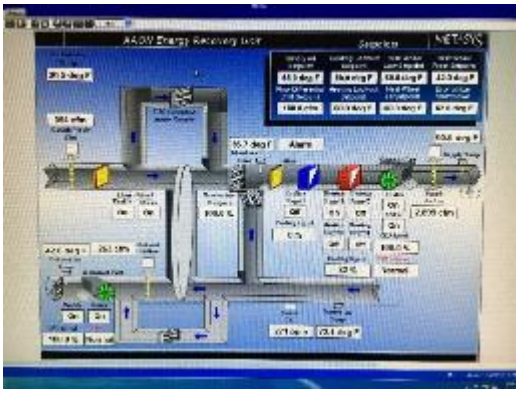
The global temperature set points are summarized below with actual ranges in space temperatures:

- Heating Season Occupied, 72°F Actual Range: 69°F - 76°F
- Heating Season Unoccupied, 62°F Actual Range: 62°F - 70°F
- Cooling Season Occupied, 75°F Actual Range: 71°F - 75°F
- Cooling Season Unoccupied, 85°F Actual Range: 75°F - 85°F

Hot Water Boiler System User Interface

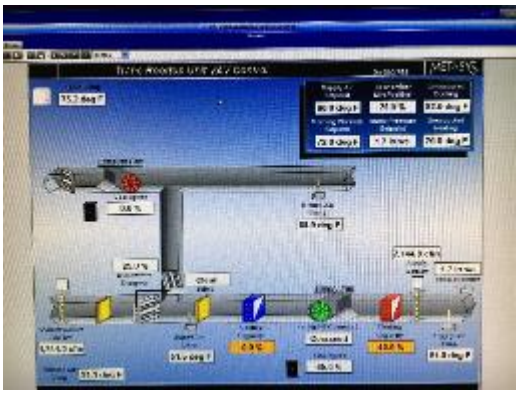


Chilled Water System User Interface



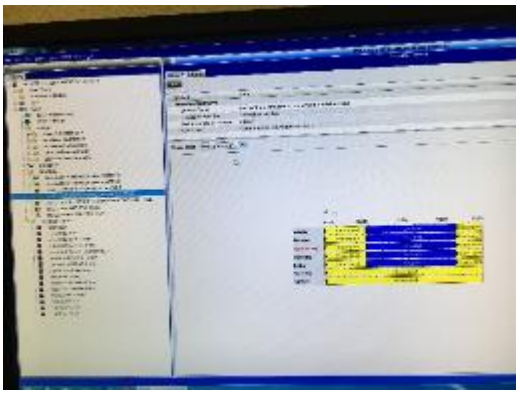
Energy Recovery Unit User Interface

Fan Coil Unit User Interface

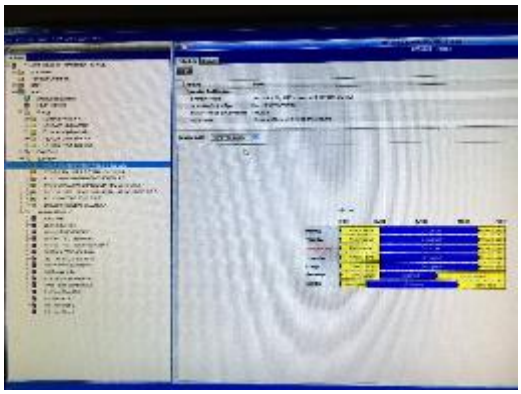


Roof Top Unit User Interface

VAV Box User Interface



Roof Top Unit Schedule User Interface



Roof Top Unit Schedule User Interface

2.9 Domestic Hot Water

Hot water is produced with four AO Smith model BTH 500A 200, 119-gallon 195-500 MBh gas-fired storage water heaters with 95% thermal efficiency. At the time of the site visit, the domestic water heaters were set between 135°F-145°F. The packaged pumping system includes two 10 hp circulation pumps that distribute water to end uses. The circulation pumps operate as needed and are driven by VFDs. The domestic hot water pipes are insulated, and the insulation is in good condition.

Storage Tank Water Heaters

Packaged Pumping System

2.10 Food Service Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare meals for students. Most cooking is done using gas-fired ovens, a griddle, and steamer. Bulk prepared foods are held in two electric holding cabinets. Equipment is high-efficiency and is in good condition. There is no dishwasher used on site.

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

Cooking Equipment

Cooking Equipment

2.11 Refrigeration

The kitchen has several stand-up refrigerators with solid doors. All equipment is high-efficiency and in good condition. The walk-in refrigerator has an estimated 2.5-ton compressor located on the roof and a 3-fan evaporator. The walk-in medium temperature freezer has an estimated 3-ton compressor located on the roof and a 3-fan evaporator. These appear to have an evaporator fan and defrost controls. The walk-in refrigeration equipment was not filled to capacity at the time of the audit. We recommend consolidating contents if possible. Reducing the amount of refrigeration equipment is a no-cost way to conserve electricity.

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

Stand-up Refrigeration Equipment

Outdoor Compressors for Walk-in Refrigeration Equipment

Walk-in Cooler Evaporator

Walk-in Freezer Evaporator

2.12 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 5% percent of total building energy use. This is higher than a typical building. You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are approximately 120 computer work stations throughout the Elementary School and approximately 700 laptops/Chromebooks. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as Smart Boards/projectors and small office printers.

There are several residential-style refrigerators throughout the building that vary in condition and efficiency. There is one refrigerated beverage vending machine, which is not currently equipped with occupancy-based controls.

Desktop Computers

Laptop Cart

Vending Machine

General Café Equipment

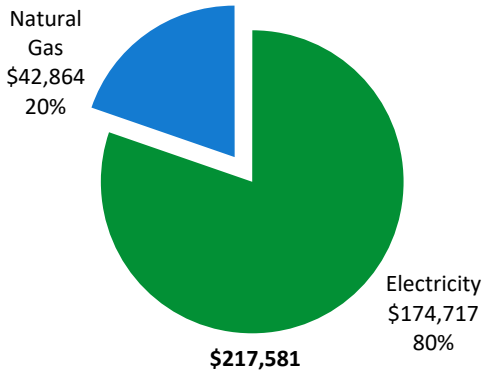
2.13 Water-Using Systems

There are restrooms with toilets, urinals, and sinks. Faucet flow rates are low at 0.5 gallons per minute (gpm). Showers in the locker rooms are not used. Toilets and urinals vary in rated gallons per flush (gpf).

3 ENERGY USE AND COSTS

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

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	1,166,908 kWh	$174,717
Natural Gas	49,454 Therms	$42,864
Total		**$217,581**



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.

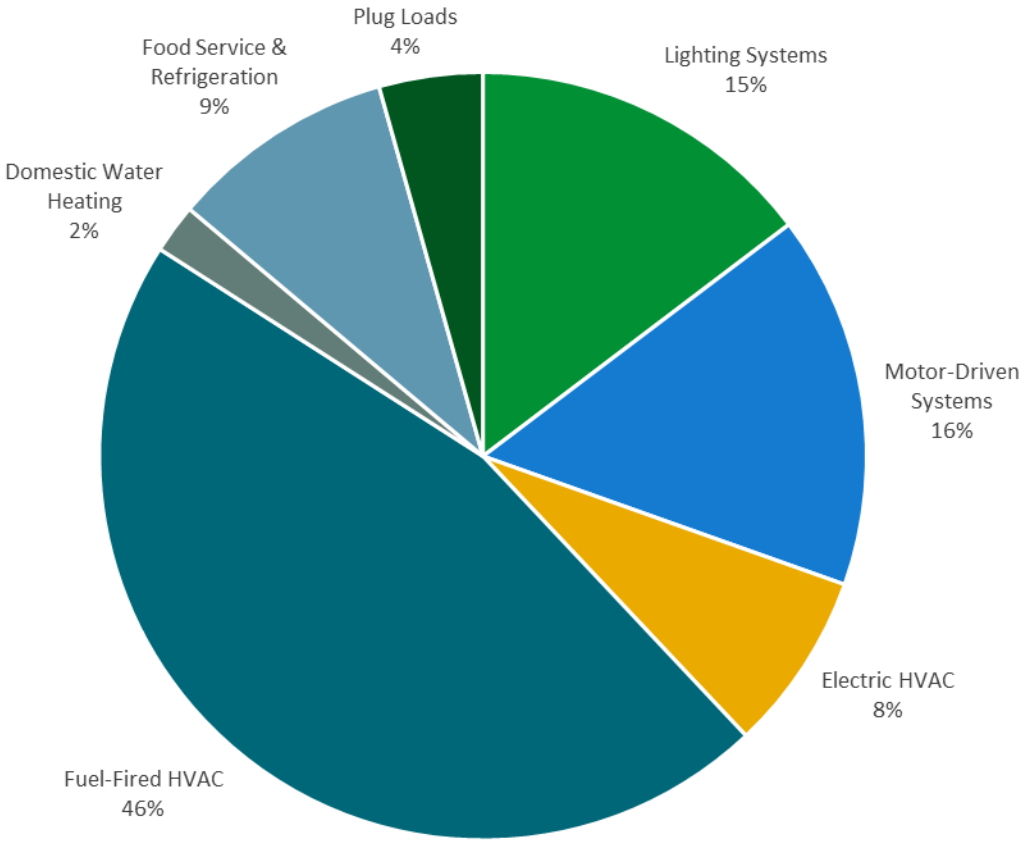
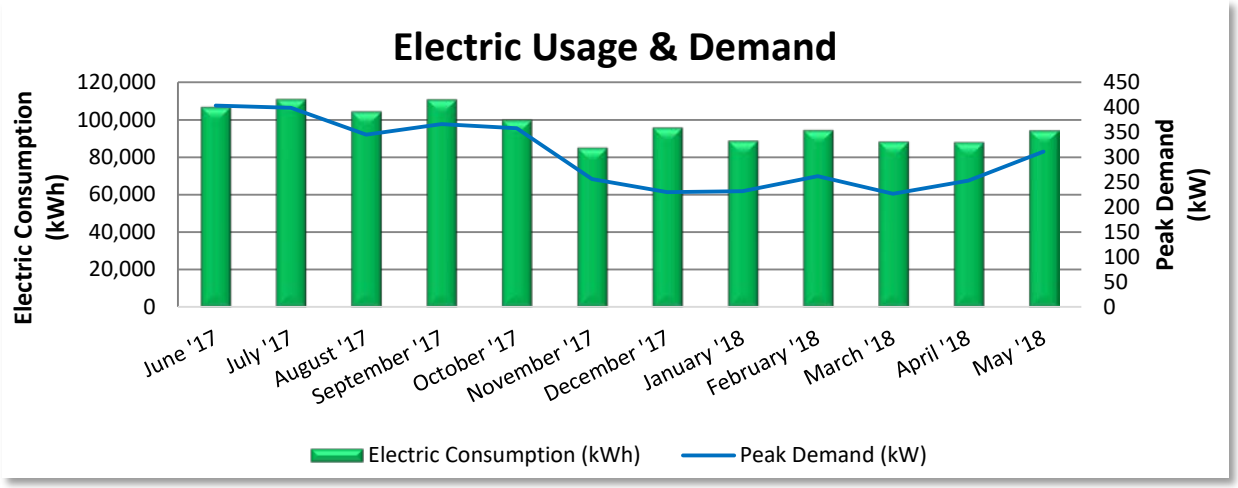


Figure 5 - Energy Balance

3.1 Electricity

PSE&G supplies and delivers electricity under rate class LPLS.



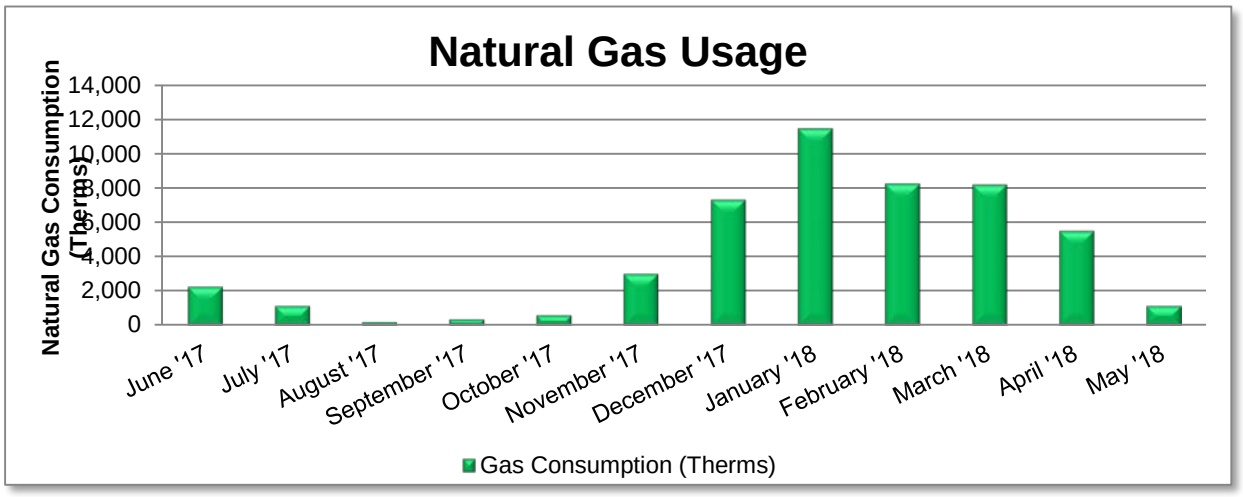
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
6/23/17	30	107,006	404	$1,521	$17,863
7/23/17	30	111,267	399	$1,503	$18,511
8/22/17	30	104,501	345	$1,301	$16,731
9/22/17	31	111,099	367	$1,381	$17,068
10/21/17	29	100,022	358	$1,350	$12,284
11/19/17	29	85,308	257	$966	$11,682
12/22/17	33	96,056	230	$866	$13,211
1/22/18	31	88,990	232	$875	$13,142
2/20/18	29	94,638	262	$988	$14,039
3/24/18	32	88,533	227	$855	$13,111
4/23/18	30	88,189	253	$953	$13,008
5/25/18	32	94,496	312	$1,174	$14,547
Totals	**366**	**1,170,105**	**404**	**$13,734**	**$175,196**
Annual	**365**	**1,166,908**	**404**	**$13,697**	**$174,717**

Notes:

- Peak demand of 404 kW occurred in June '17.
- The average electric cost over the past 12 months was $0.150/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 average demand across these twelve months of data is 304 kW.

3.2 Natural Gas

PSE&G supplies and delivers natural gas under rate class LVG.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
6/23/17	30	2,278	$1,584
7/23/17	30	1,146	$839
8/22/17	30	220	$246
9/22/17	31	364	$335
10/21/17	29	607	$487
11/19/17	29	3,010	$3,107
12/22/17	33	7,334	$6,399
1/22/18	31	11,487	$10,007
2/20/18	29	8,268	$8,243
3/24/18	32	8,216	$7,538
4/23/18	30	5,517	$3,395
5/25/18	32	1,141	$801
Totals	**366**	**49,589**	**$42,981**
Annual	**365**	**49,454**	**$42,864**

Notes:

- The average gas cost for the past 12 months is $0.867/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	47

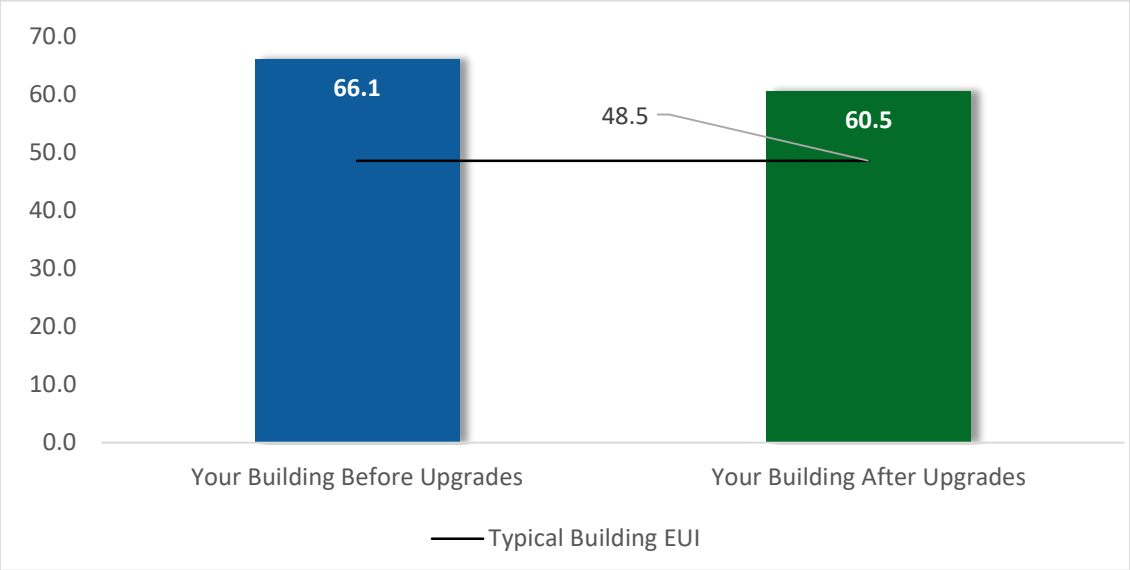


Figure 6 - Energy Use Intensity Comparison

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 *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		**213,387**	**48.3**	**-44**	**$31,565**	**$82,871**	**$19,562**	**$63,309**	**2.0**	**209,681**
ECM 1	Retrofit Fixtures with LED Lamps	213,387	48.3	-44	$31,565	$82,871	$19,562	$63,309	2.0	209,681
Lighting Control Measures		**13,799**	**1.5**	**-3**	**$2,041**	**$7,020**	**$140**	**$6,880**	**3.4**	**13,558**
ECM 2	Install Occupancy Sensor Lighting Controls	6,229	0.8	-1	$921	$1,620	$140	$1,480	1.6	6,120
ECM 3	Install High/Low Lighting Controls	7,571	0.7	-2	$1,120	$5,400	$0	$5,400	4.8	7,438
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$241**	**$230**	**$50**	**$180**	**0.7**	**1,623**
ECM 4	Vending Machine Control	1,612	0.2	0	$241	$230	$50	$180	0.7	1,623
Custom Measures		**37,200**	**0.0**	**210**	**$7,394**	**$45,300**	**$0**	**$45,300**	**6.1**	**62,104**
ECM 5	Computer Power Management Software	6,029	0.0	0	$903	$4,300	$0	$4,300	4.8	6,071
ECM 6	Retro-Commissioning Study & HVAC Improvements	31,171	0.0	210	$6,491	$41,000	$0	$41,000	6.3	56,033
TOTALS		**265,999**	**50.0**	**163**	**$41,242**	**$135,421**	**$19,752**	**$115,669**	**2.8**	**286,966**

* - 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		**213,387**	**48.3**	**-44**	**$31,565**	**$82,871**	**$19,562**	**$63,309**	**2.0**	**209,681**
ECM 1	Retrofit Fixtures with LED Lamps	213,387	48.3	-44	$31,565	$82,871	$19,562	$63,309	2.0	209,681
Lighting Control Measures		**13,799**	**1.5**	**-3**	**$2,041**	**$7,020**	**$140**	**$6,880**	**3.4**	**13,558**
ECM 2	Install Occupancy Sensor Lighting Controls	6,229	0.8	-1	$921	$1,620	$140	$1,480	1.6	6,120
ECM 3	Install High/Low Lighting Controls	7,571	0.7	-2	$1,120	$5,400	$0	$5,400	4.8	7,438
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$241**	**$230**	**$50**	**$180**	**0.7**	**1,623**
ECM 4	Vending Machine Control	1,612	0.2	0	$241	$230	$50	$180	0.7	1,623
Custom Measures		**37,200**	**0.0**	**210**	**$7,394**	**$45,300**	**$0**	**$45,300**	**6.1**	**62,104**
ECM 5	Computer Power Management Software	6,029	0.0	0	$903	$4,300	$0	$4,300	4.8	6,071
ECM 6	Retro-Commissioning Study & HVAC Improvements	31,171	0.0	210	$6,491	$41,000	$0	$41,000	6.3	56,033
TOTALS		**265,999**	**50.0**	**163**	**$41,242**	**$135,421**	**$19,752**	**$115,669**	**2.8**	**286,966**

* - 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		**213,387**	**48.3**	**-44**	**$31,565**	**$82,871**	**$19,562**	**$63,309**	**2.0**	**209,681**
ECM 1	Retrofit Fixtures with LED Lamps	213,387	48.3	-44	$31,565	$82,871	$19,562	$63,309	2.0	209,681

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

ECM 1: Retrofit Fixtures with LED Lamps

Replace fluorescent and compact fluorescent 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 yet provide equivalent lighting output for the space. Maintenance savings may also be available as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes or compact fluorescent lamps.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**13,799**	**1.5**	**-3**	**$2,041**	**$7,020**	**$140**	**$6,880**	**3.4**	**13,558**
ECM 2	Install Occupancy Sensor Lighting Controls	6,229	0.8	-1	$921	$1,620	$140	$1,480	1.6	6,120
ECM 3	Install High/Low Lighting Controls	7,571	0.7	-2	$1,120	$5,400	$0	$5,400	4.8	7,438

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 2: 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: security office, dance room, storage room, and multipurpose room.

ECM 3: 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.

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

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

Affected building areas: hallways.

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

4.3 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**1,612**	**0.2**	**0**	**$241**	**$230**	**$50**	**$180**	**0.7**	**1,623**
ECM 4	Vending Machine Control	1,612	0.2	0	$241	$230	$50	$180	0.7	1,623

ECM 4: Vending Machine Control

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

4.4 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		**37,200**	**0.0**	**210**	**$7,394**	**$45,300**	**$0**	**$45,300**	**6.1**	**62,104**
ECM 5	Computer Power Management Software	6,029	0.0	0	$903	$4,300	$0	$4,300	4.8	6,071
ECM 6	Retro-Commissioning Study & HVAC Improvements	31,171	0.0	210	$6,491	$41,000	$0	$41,000	6.3	56,033

ECM 5: Computer Power Management Software

We evaluated the implementation of computer power management software at a high level. The computing environment in most school and office facilities includes desktops, which are typically left on over nights, weekends and holidays. Screen savers are commonly confused as a power management strategy. This contributes to excessive electrical energy consumption, which may be avoided by proper management. There are innovative software packages available in the market today that are designed to deliver significant energy saving and provide ongoing tracking measurements.

Operational and maintenance benefits are captured using a central power management platform where issues may be diagnosed, and problematic devices may be isolated. Energy savings policies may be enforced, as well as identifying and eliminating underutilized devices. This measure investigates the potential benefits to implementing computer power management software to better match the energy use to user needs.

This measure in effort to increase the plug load management of the school district was of interest for facility personnel. Further analysis should be conducted for the feasibility of this measure. An entire baseline tracking of existing computing fleet energy use would need to be performed to optimize proposed software strategies. This would need to be implemented in conjunction with the IT department. This is not an investment grade analysis nor should be used as a basis for design and construction.

ECM 6: Retro-Commissioning Study & HVAC Improvements

The upgrading of an Energy Management System (EMS) would increase the efficiency of the building HVAC system operation. Retro-commissioning is a common practice recommended by the American Society of Heating Refrigeration and Energy (ASHRAE) to be revisited every couple of years. Since the building is fairly new, this may not be cost-effective today. However, this may be cost effective in the future.

Due to the complexity of today's HVAC systems and controls, it is likely for systems to be operating incorrectly or below potential efficiency. Retro-commissioning studies reveal hidden deficiencies and highlights operational and maintenance (O&M) issues that could have been avoided as well as exposes 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, and 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 Elementary School.

We have identified some potential retro-commissioning activities based on our audit. One is to reinstate the full operation of the energy management. A second related item is to investigate the building schedules, particularly for the multipurpose room as noted above. Finally, we noted the relatively high return water temperature in your boiler loop system, 154.1°F–above the range that is optimum for condensing boiler efficiency.

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.

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.

Window Treatments/Coverings

Use high-reflectivity films or cover windows with shades or shutters to reduce solar heat gain and reduce the load on cooling and heating systems. Older, single pane windows and east or west-facing windows are especially prone to solar heat gain. In addition, use shades or shutters at night during cold weather to reduce heat loss.

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.

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.

Fans to Reduce Cooling Load

Install ceiling fans to supplement your cooling system. Thermostat settings can typically be increased by 4°F with no change in overall occupant comfort due to the wind chill effect of moving air.

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

Destratification Fans

For areas with high ceilings, destratification fans f air balance the air temperature from floor to ceiling. They help reduce the recovery time needed to warm the space after nightly temperature setbacks and will increase occupants' the comfort level.

Areas with high ceilings require the heating system to heat a larger volume of space than that which is occupied. As the warm air rises, the warmest space is at the ceiling level, rather than floor level. Higher temperatures at the ceiling accelerate heat loss through the roof, which requires additional energy consumption by the heating equipment to compensate for this accelerated heat transfer.

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.

Chiller Maintenance

Service chillers regularly to keep them operating properly. Chillers are responsible for a substantial portion of a commercial building's overall energy usage and when they do not work well, there is usually a noticeable increase in energy bills and increased occupant complaints. Regular diagnostics and service can save five to ten percent of the cost of operating your chiller. If you already have a maintenance contract in place, your existing service company should be able to provide these services.

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.

Duct Sealing

Duct leakage in commercial buildings can account for five to twenty-five percent of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building wasting conditioned air. Eliminating duct leaks can improve ventilation system performance and reduce heating and cooling system operation.

Boiler Maintenance

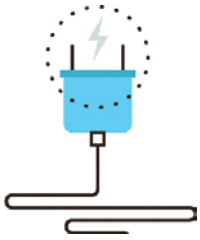
Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is 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.

Water Heater Maintenance

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

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

Plug Load Controls



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

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

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 gpf and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

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

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

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the Elementary 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.

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

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

6 On-site Generation

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the Elementary 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 Elementary 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 Elementary School's electric demand, size and location of free area, and shading elements shows that the facility has **high** potential for installing a PV array.

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

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

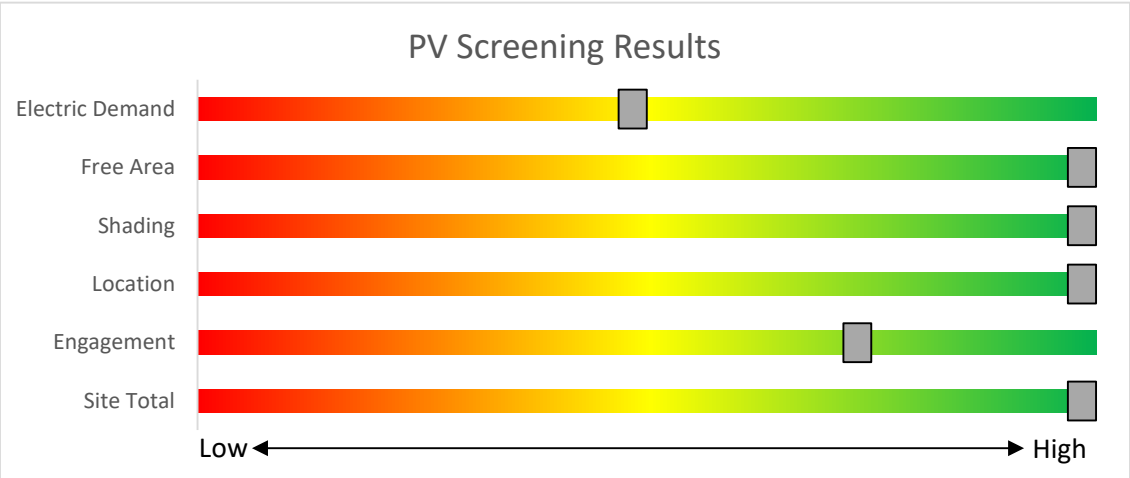


Figure 9 - Photovoltaic Screening

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

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

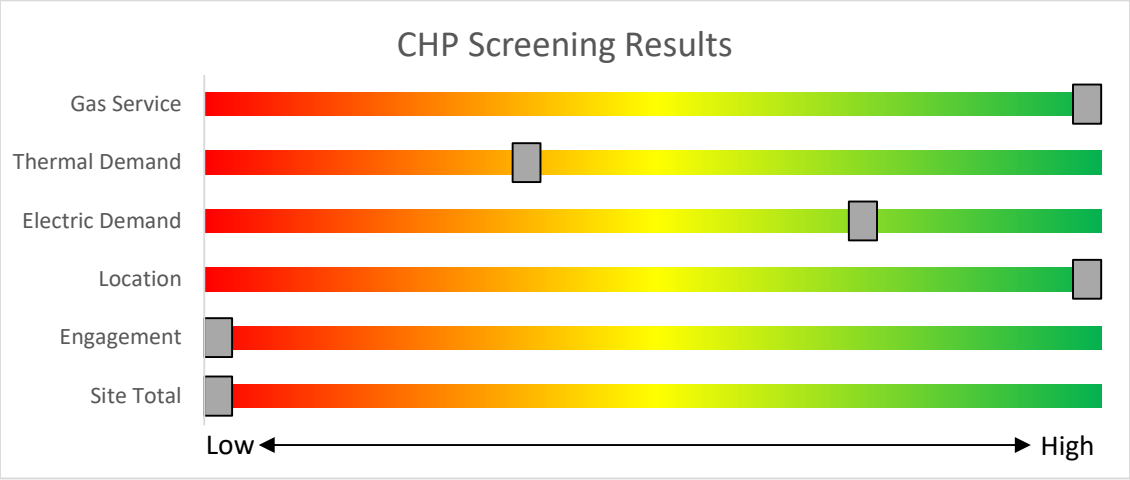


Figure 10 - Combined Heat and Power Screening

7 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? New Jersey's Clean Energy Programs can help. Pick the program that works best for you. Incentive programs that may apply to this facility are identified in the Executive Summary. This section provides an overview of currently available 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[8].

8.2 Retail Natural Gas Supply Options

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

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

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

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

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

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

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lobby/Entrance	2	LED - Fixtures: High Performance Recessed Downlight Fixture	Wall Switch	S	37	4,380		None	No	2	LED - Fixtures: High Performance Recessed Downlight Fixture	Wall Switch	37	4,380	0.0	0	0	$0	$0	$0	0.0
Nurse's Office A108	12	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	12	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.1	341	0	$50	$390	$72	6.3
Nurse's Office A108	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Exam Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Exam Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Storage - Locked	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Community Room A110	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Community Room A110	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	62	0	$9	$37	$10	2.9
Student Services A111	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Storage A110B	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Office A110C	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Office A110D	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Office A110K	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Office A110E	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Office A110F	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Office A110G	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Office A110H	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Testing Room A110J	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Main Office	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	4,380	1	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,380	0.3	1,908	0	$282	$438	$120	1.1
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	4,380	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	4,380	0.0	318	0	$47	$73	$20	1.1
Main Office	3	Compact Fluorescent: Plug in Lamp	Occupancy Sensor	S	23	4,380	1	Relamp	No	3	LED Lamps: Screw in Lamp	Occupancy Sensor	16	4,380	0.0	101	0	$15	$52	$3	3.3
Security Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	8,760	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,044	0.1	809	0	$120	$343	$20	2.7
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	234	0	$35	$146	$40	3.1
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	8,760	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	8,760	0.0	636	0	$94	$73	$20	0.6

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchenette	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Storage - Locked	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Small Group Classroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Small Group Classroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Small Group Classroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Small Group Classroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Teacher's Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Cafeteria	8	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	S	112	1,615		None	No	8	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	112	1,615	0.0	0	0	$0	$0	$0	0.0
Cafeteria	16	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	S	149	1,615		None	No	16	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	149	1,615	0.0	0	0	$0	$0	$0	0.0
Kitchen	17	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,680	1	Relamp	No	17	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,680	0.3	2,407	-1	$356	$829	$153	1.9
Dry Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,996	0.1	435	0	$64	$110	$30	1.2
Food Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	5,187	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	5,187	0.0	377	0	$56	$73	$20	1.0
Locker Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	5,187	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	5,187	0.0	377	0	$56	$73	$20	1.0
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	5,187	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	5,187	0.0	377	0	$56	$73	$20	1.0

	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
Dishwashing	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,996	0.1	435	0	$64	$110	$30	1.2
Storage Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Storage Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	365	0	$54	$130	$24	2.0
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	365	0	$54	$130	$24	2.0
Faculty Dining	1	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	S	112	1,615		None	No	1	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	112	1,615	0.0	0	0	$0	$0	$0	0.0
Faculty Dining	3	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	S	149	1,615		None	No	3	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	149	1,615	0.0	0	0	$0	$0	$0	0.0
Faculty Dining	1	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	S	112	1,615		None	No	1	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	112	1,615	0.0	0	0	$0	$0	$0	0.0
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	234	0	$35	$146	$40	3.1
Electric Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	8,760	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	8,760	0.1	954	0	$141	$110	$30	0.6
Hallway	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	4,380	1, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,022	0.4	2,630	-1	$389	$1,150	$130	2.6
Hallway	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	8,760	1, 3	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	6,044	0.6	7,688	-2	$1,137	$1,594	$190	1.2
Multipurpose Room	20	U-Bend Fluorescent - T8: U T8 (30W) - 5L	Wall Switch	S	150	2,340	1, 2	Relamp	Yes	20	LED - Linear Tubes: (5) U-Lamp	Occupancy Sensor	85	1,615	1.3	4,703	-1	$696	$4,163	$70	5.9
Multipurpose Room	12	U-Bend Fluorescent - T8: U T8 (30W) - 5L	Wall Switch	S	150	8,760	1, 2	Relamp	Yes	12	LED - Linear Tubes: (5) U-Lamp	Occupancy Sensor	85	6,044	0.8	10,563	-2	$1,562	$2,444	$35	1.5
Specialty Lights	11	Halogen Incandescent: HPL 575/115X	Other		575	200		None	No	11	Halogen Incandescent: HPL 575/115X	Other	575	200	0.0	0	0	$0	$0	$0	0.0
Dance Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 6L	None	S	176	8,760	1, 2	Relamp	Yes	6	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	6,044	0.5	6,705	-1	$992	$927	$215	0.7
Electric Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	170	0	$25	$73	$20	2.1
Electric Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	8,760	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	8,760	0.1	954	0	$141	$110	$30	0.6
Storage Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	432	0	$64	$416	$40	5.9
Storage Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Vestibules	2	Compact Fluorescent: 32W CFL 6" Recessed Downlight	None	S	32	4,380	1	Relamp	No	2	LED Lamps: Plug in Lamp	None	18	4,380	0.0	135	0	$20	$50	$2	2.4
Vestibules	2	Compact Fluorescent: 32W CFL 6" Recessed Downlight	None	S	32	8,760	1	Relamp	No	2	LED Lamps: Plug in Lamp	None	18	8,760	0.0	270	0	$40	$50	$2	1.2
Vocal Music Room	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,319	0	$195	$822	$225	3.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Vocal Music Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Vestibules	1	Compact Fluorescent: 32W CFL 6" Recessed Downlight	None	S	32	4,380	1	Relamp	No	1	LED Lamps: Plug in Lamp	None	18	4,380	0.0	67	0	$10	$25	$1	2.4
Vestibules	7	Compact Fluorescent: 32W CFL 6" Recessed Downlight	None	S	32	8,760	1	Relamp	No	7	LED Lamps: Plug in Lamp	None	18	8,760	0.1	944	0	$140	$177	$7	1.2
Hallway	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	4,000	1, 3	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,760	0.3	2,032	0	$301	$852	$110	2.5
Hallway	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	8,760	1, 3	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	6,044	0.5	6,474	-1	$958	$1,259	$160	1.1
Lobby/Entrance	9	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	S	37	8,760		None	No	9	LED - Fixtures: High Performance Recessed Downlight Fixture	Occupancy Sensor	37	8,760	0.0	0	0	$0	$0	$0	0.0
Transition Spaces	44	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	44	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Teacher Work Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	234	0	$35	$146	$40	3.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Pre-K Classroom D101	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,231	0	$182	$767	$210	3.1
Pre-K Classroom D101	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Pre-K Classroom D102	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,231	0	$182	$767	$210	3.1
Pre-K Classroom D102	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Pre-K Classroom D103	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,231	0	$182	$767	$210	3.1
Pre-K Classroom D103	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Pre-K Classroom D105	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,231	0	$182	$767	$210	3.1
Pre-K Classroom D105	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Pre-K Classroom D106	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,231	0	$182	$767	$210	3.1
Pre-K Classroom D106	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Pre-K Classroom D107	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,231	0	$182	$767	$210	3.1
Pre-K Classroom D107	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Electric Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Stairwells	143	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	8,760	1	Relamp	No	143	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	3.4	45,472	-10	$6,726	$5,222	$1,430	0.6
Computer Lab B102	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.7	1,846	0	$273	$1,150	$315	3.1
Computer Lab B102	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	8,760	1	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	8,760	0.2	3,339	-1	$494	$383	$105	0.6
Computer Lab B102	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B103	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B103	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Classroom B104	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B104	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Classroom B134	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B134	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Classroom B132	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B132	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Classroom B131	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B131	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	114	0	$17	$130	$24	6.3
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	114	0	$17	$130	$24	6.3
Classroom B111	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B111	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Classroom B112	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B112	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Classroom B114	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B114	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Classroom B115	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B115	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Classroom B119	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B119	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B120	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B120	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B123	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B123	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Fire Service Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	170	0	$25	$73	$20	2.1
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Hallway	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	4,000	1, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,760	0.2	1,478	0	$219	$742	$80	3.0

	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
Hallway	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	8,760	1, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	6,044	0.4	4,855	-1	$718	$888	$120	1.1
Media Center	11	U-Bend Fluorescent - T8: U T8 (32W) - 1L	Occupancy Sensor	S	39	1,615	1	Relamp	No	11	LED - Linear Tubes: (1) U-Lamp	Occupancy Sensor	17	1,615	0.2	440	0	$65	$399	$55	5.3
Media Center	13	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Occupancy Sensor	S	92	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,615	0.4	981	0	$145	$1,413	$195	8.4
Media Center	13	U-Bend Fluorescent - T8: U T8 (32W) - 5L	Occupancy Sensor	S	153	1,615	1	Relamp	No	13	LED - Linear Tubes: (5) U-Lamp	Occupancy Sensor	85	1,615	0.6	1,578	0	$233	$2,355	$0	10.1
Media Center	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	36	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	1.3	3,165	-1	$468	$1,972	$540	3.1
Conference Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.1	264	0	$39	$164	$45	3.1
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	59	0	$9	$37	$10	3.1
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	59	0	$9	$37	$10	3.1
Art Classroom B202	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,231	0	$182	$767	$210	3.1
Art Classroom B202	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	8,760	1	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	8,760	0.2	3,339	-1	$494	$383	$105	0.6
Art Classroom B202	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B203	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B203	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B205	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B205	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B232	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B232	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B233	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B233	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B235	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B235	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	59	0	$9	$37	$10	3.1
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	365	0	$54	$130	$24	2.0
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	365	0	$54	$130	$24	2.0
Classroom B212	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B212	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Classroom B213	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B213	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Classroom B216	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B216	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Classroom B215	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B215	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B219	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B219	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B220	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B220	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B222	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classroom B222	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B223	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B223	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B224	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B227	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	59	0	$9	$37	$10	3.1
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Small Group Classroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Small Group Classroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Small Group Classroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Small Group Classroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Teacher's Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Hallway	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	4,000	1, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,760	0.2	1,478	0	$219	$742	$80	3.0
Hallway	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	8,760	1, 3	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	6,044	0.2	3,237	-1	$479	$742	$80	1.4
Gym	24	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Occupancy Sensor	S	176	1,615	1	Relamp	No	24	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	1,615	1.5	3,794	-1	$561	$2,629	$720	3.4
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	183	0	$27	$65	$12	2.0
Locker Room	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,401	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,401	0.0	239	0	$35	$130	$24	3.0
Shower Room	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	183	0	$27	$65	$12	2.0
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Restroom	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	57	0	$8	$65	$12	6.3
Locker Room	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	114	0	$17	$130	$24	6.3
Shower Room	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	57	0	$8	$65	$12	6.3
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	365	0	$54	$130	$24	2.0
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	365	0	$54	$130	$24	2.0
Tech Robotics	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.7	1,846	0	$273	$1,150	$315	3.1
Tech Robotics	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	8,760	1	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	8,760	0.2	3,339	-1	$494	$383	$105	0.6
Tech Robotics	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.1	155	0	$23	$91	$25	2.9
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Storage	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.2	527	0	$78	$329	$90	3.1
Mechanical Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	8,760	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	8,760	0.0	636	0	$94	$73	$20	0.6
Mechanical Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.1	255	0	$38	$110	$30	2.1
Hallway	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	4,000	1, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,760	0.3	1,848	0	$273	$815	$100	2.6
Hallway	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	8,760	1, 3	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	6,044	0.3	3,642	-1	$539	$779	$90	1.3
Science Lab B302	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	8,760	1	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	8,760	0.2	3,339	-1	$494	$383	$105	0.6
Science Lab B302	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,231	0	$182	$767	$210	3.1
Science Lab B302	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.1	264	0	$39	$164	$45	3.1
Science Lab B302	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	62	0	$9	$37	$10	2.9
Classroom B303	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B303	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B305	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B305	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classroom B330	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B330	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B331	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B331	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B333	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B333	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	59	0	$9	$37	$10	3.1
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	365	0	$54	$130	$24	2.0
Restroom	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	5,187	1	Relamp	No	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	5,187	0.0	365	0	$54	$130	$24	2.0
Classroom B312	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B312	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Classroom B313	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B313	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	3,996	1	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,996	0.0	211	0	$31	$98	$18	2.5
Classroom B315	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B315	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Science Lab B316	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.7	1,846	0	$273	$1,150	$315	3.1
Science Lab B316	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.1	264	0	$39	$164	$45	3.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Science Lab B316	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B318	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B318	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B319	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B319	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Classroom B321	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.5	1,143	0	$169	$712	$195	3.1
Classroom B321	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Science Lab B322	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.7	1,846	0	$273	$1,150	$315	3.1
Science Lab B322	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,615	1	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,615	0.1	264	0	$39	$164	$45	3.1
Science Lab B322	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,340	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,340	0.0	85	0	$13	$37	$10	2.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	59	0	$9	$37	$10	3.1
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.0	117	0	$17	$73	$20	3.1
Small Group Classroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Small Group Classroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Small Group Classroom	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	352	0	$52	$219	$60	3.1
Small Group Classroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,615	1	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,615	0.0	93	0	$14	$55	$15	2.9
Teacher's Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,615	1	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,615	0.1	176	0	$26	$110	$30	3.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,615	1	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,615	0.0	28	0	$4	$33	$6	6.3
Exterior	17	Compact Fluorescent: 32W CFL 6" Recessed Downlight	Timeclock		32	4,380	1	Relamp	No	17	LED Lamps: Plug in Lamp	Timeclock	18	4,380	0.1	1,042	0	$156	$429	$17	2.6
Exterior	62	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		26	4,380		None	No	62	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	26	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock		50	4,380		None	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	50	4,380	0.0	0	0	$0	$0	$0	0.0

Motor Inventory & Recommendations

		Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	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
Mechanical Room	Hot Water Pumps	3	Heating Hot Water Pump	1.0	87.5%	Yes	W	2,745		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	Hot Water Pumps	2	Heating Hot Water Pump	3.0	87.5%	Yes	W	2,745		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	Chilled Water Pumps	3	Chilled Water Pump	5.0	87.5%	Yes	W	2,745		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	Domestic Hot Water	2	Water Supply Pump	0.7	74.0%	No	W	1,400		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room	Domestic Hot Water	2	Water Supply Pump	10.0	89.5%	Yes	W	1,400		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Various	RTU VAV Boxes	23	Exhaust Fan	0.3	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Various	Fan Coil Units	99	Fan Coil Unit	0.3	70.0%	No	W	2,745		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Elevator	Elevator	2	Other	50.0	90.0%	No	W	146		No	90.0%	No		0.0	0	0	$0	$0	$0	0.0
Kitchen	Exhaust	3	Kitchen Hood Exhaust Fan	0.3	74.0%	No	W	5,250		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Kitchen	Exhaust	1	Kitchen Hood Exhaust Fan	7.5	91.0%	Yes	W	5,250		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
AHU Room	Exhaust	2	Exhaust Fan	10.0	91.7%	Yes	W	3,391		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
HWUHs	Hot Water Unit Heaters	18	Supply Fan	0.0	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTUs	5	Supply Fan	7.5	91.0%	Yes	W	3,391		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTUs	2	Supply Fan	20.0	93.0%	Yes	W	3,391		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTUs	1	Supply Fan	15.0	93.0%	Yes	W	3,391		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTUs	1	Supply Fan	10.0	91.7%	Yes	W	3,391		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERUs	1	Supply Fan	3.0	89.5%	Yes	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERUs	1	Supply Fan	5.0	89.5%	Yes	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTUs	2	Exhaust Fan	1.0	85.5%	Yes	W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERUs	1	Exhaust Fan	3.0	89.5%	Yes	W	2,745		No	89.5%	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	ERUs	2	Exhaust Fan	5.0	89.5%	Yes	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	ERUs	1	Exhaust Fan	2.0	86.5%	Yes	W	2,745		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTUs	2	Exhaust Fan	1.0	85.5%	Yes	W	2,745		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTUs	4	Combustion Air Fan	0.3	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	MUA	1	Supply Fan	7.5	91.0%	No	W	3,391		No	91.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	MUA	1	Exhaust Fan	3.0	89.5%	No	W	2,745		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0

Electric HVAC Inventory & Recommendations

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
RTU A103	Administration	1	Packaged AC	30.00		W		No							0.0	0	0	$0	$0	$0	0.0
RTU A200	Media Center	1	Packaged AC	20.00		W		No							0.0	0	0	$0	$0	$0	0.0
RTU C207	Gym	1	Packaged AC	20.00		W		No							0.0	0	0	$0	$0	$0	0.0
RTU C207A	Gym	1	Packaged AC	20.00		W		No							0.0	0	0	$0	$0	$0	0.0
RTU C116	Multi-Purpose Room	1	Packaged AC	40.00		W		No							0.0	0	0	$0	$0	$0	0.0
RTU C116A	Multi-Purpose Room	1	Packaged AC	20.00		W		No							0.0	0	0	$0	$0	$0	0.0
RTU C107	Cafeteria	1	Packaged AC	30.00		W		No							0.0	0	0	$0	$0	$0	0.0
RTU C108	Kitchen	1	Packaged AC	17.50		W		No							0.0	0	0	$0	$0	$0	0.0
ERU-1	ERU-1	1	Packaged AC	10.00		W		No							0.0	0	0	$0	$0	$0	0.0
ERU-2	ERU-2	1	Packaged AC	50.00		W		No							0.0	0	0	$0	$0	$0	0.0
ERU-3	ERU-3	1	Packaged AC	50.00		W		No							0.0	0	0	$0	$0	$0	0.0
ERU-4	ERU-4	1	Packaged AC	15.00		W		No							0.0	0	0	$0	$0	$0	0.0
Mechanical Spaces	Mechanical Spaces	2	Electric Resistance Heat		17.07	W		No							0.0	0	0	$0	$0	$0	0.0
Hallway Areas	Hallway Areas	2	Electric Resistance Heat		10.24	W		No							0.0	0	0	$0	$0	$0	0.0
Outdoor Condensing Units	Outdoor Condensing Units	9	Split-System AC	1.00		W		No							0.0	0	0	$0	$0	$0	0.0
Outdoor Condensing Units	Outdoor Condensing Units	1	Split-System AC	0.80		W		No							0.0	0	0	$0	$0	$0	0.0

Electric Chiller Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Remaining Useful Life	ECM #	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	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	Chilled Water System	1	Air-Cooled Scroll Chiller	60.00	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	Chilled Water System	1	Air-Cooled Scroll Chiller	60.00	W		No							0.0	0	0	$0	$0	$0	0.0

Fuel Heating Inventory & Recommendations

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Space Heating	1	Condensing Hot Water Boiler	960.00	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler Room	Space Heating	1	Condensing Hot Water Boiler	960.00	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler Room	Space Heating	1	Condensing Hot Water Boiler	960.00	W		No						0.0	0	0	$0	$0	$0	0.0
RTU A103	Administration	1	Furnace	283.50	W		No						0.0	0	0	$0	$0	$0	0.0
RTU A200	Media Center	1	Furnace	324.00	W		No						0.0	0	0	$0	$0	$0	0.0
RTU C207	Gym	1	Furnace	324.00	W		No						0.0	0	0	$0	$0	$0	0.0
RTU C207A	Gym	1	Furnace	324.00	W		No						0.0	0	0	$0	$0	$0	0.0
RTU C116	Multi-Purpose Room	1	Furnace	283.50	W		No						0.0	0	0	$0	$0	$0	0.0
RTU C116A	Multi-Purpose Room	1	Furnace	324.00	W		No						0.0	0	0	$0	$0	$0	0.0
RTU C107	Cafeteria	1	Furnace	486.00	W		No						0.0	0	0	$0	$0	$0	0.0
RTU C108	Kitchen	1	Furnace	284.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	ERU-1	1	Furnace	168.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	ERU-2	1	Furnace	864.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	ERU-3	1	Furnace	864.00	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	ERU-4	1	Furnace	315.90	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	MUA-1	1	Furnace	486.00	W		No						0.0	0	0	$0	$0	$0	0.0

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
Roof	Domestic Hot Water	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	Domestic Hot Water	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	Domestic Hot Water	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Roof	Domestic Hot Water	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
Kitchen	1	Medium Temp Freezer (0F to 30F)		No	No	No	0.0	0	0	$0	$0	$0	0.0
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	4	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Insulated Food Holding Cabinet (1/2 Size)	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/0!
Kitchen	3	Gas Rack Oven (Single)	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/0!
Kitchen	1	Gas Convection Oven (Half Size)	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/0!
Kitchen	1	Gas Griddle (≤2 Feet Width)	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	2	Gas Convection Oven (Full Size)	Yes		No	0.0	0	0	FALSE	$0	$0	#DIV/0!

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
School	120	Computers	120.0	
School	700	Laptops	90.0	
School	4	Large Speakers	500.0	
School	2	TV	150.0	
School	44	Smart Board / Projector	300.0	
School	63	Small Office Printers	50.0	
School	5	Large Xerox- Type Printers	515.0	
School	2	Coffee Maker	400.0	
School	8	Microwave	1,100.0	
School	5	Residential Refrigerator	690.0	
School	3	Medium Sized Refrigerator	450.0	
School	1	Mini Fridge	260.0	
School	3	Water Dispenser	300.0	
School	1	Misc. Sound Equipment	3,500.0	
School	1	Misc. IT Equipment	4,500.0	
School	1	Misc Kitchen Equipment	5,500.0	

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Faculty Dining	1	Refrigerated	4	Yes	0.2	1,612	0	$241	$230	$50	0.7

Custom Measure (High Level Screening)

Computer Power Management Software

# of Desktops	Normal Running Mode					Idle Running Mode					Suspended/Off Mode				
120	*Mon - Fri 8AM-5PM*	*Mon - Fri 5PM-8AM*	*Weekends & Holidays*	Energy Rate (W)*	Weekly Run Hours	Mon - Fri 8AM-5PM	Mon - Fri 5PM-8AM	*Weekends & Holidays*	*Energy Rate (W)**	*Weekly Run Hours*	Mon - Fri 8AM-5PM	Mon - Fri 5PM-8AM	Weekends & Holidays	Energy Rate (W)*	*Weekly Run Hours*
Existing Conditions	40%	10%	0%	120	26	15%	15%	10%	80	23	45%	75%	90%	5	120
Proposed Conditions	40%	5%	0%	120	22	10%	5%	0%	80	8	50%	90%	100%	5	138

	Usage per Device			Energy Impact & Financial Analysis					
	Weeks of Use	Annual kWh Usage	*Diversity Factor***	Total Annual kWh Savings	Total Annual Energy Cost Savings	*Cost per Desktop*	*Add'l Hardware Cost*	Total Installation Cost	Simple Payback Period (Years)
Existing Conditions	44	241	75%	6,029	$903	$15.00	$2,500	$4,300	4.8
Proposed Conditions	44	191							

Note: Diversity Factor is a conservative estimate of how many devices will operate with power management software and will not be manually overridden by users

Retro-Commissioning Study & HVAC Improvements

Existing Conditions				Proposed Conditions			Energy Impact & Financial Analysis					
Annual Electric HVAC Energy Use (kWh)	*Annual Heating Gas Use (mmBtu)*	*Annual Heating Oil Use (mmBtu)*	*Annual Motor HVAC Energy Use (kWh)*	Assumed % Cooling Savings	Assumed % Heating Savings	Assumed % Motor Savings	Total Annual kWh Savings	Total Annual Gas mmBtu Savings	Total Annual Fuel mmBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Simple Payback Period (Years)
202,257	4,209.4	0.0	421,164	5%	5%	5%	31,171	210	0	$6,491	$41,000	6.3

Equations: (Based on Industry Standards)

Average Cost for retro-commissioining studies and control improvements is $0.30/sqft

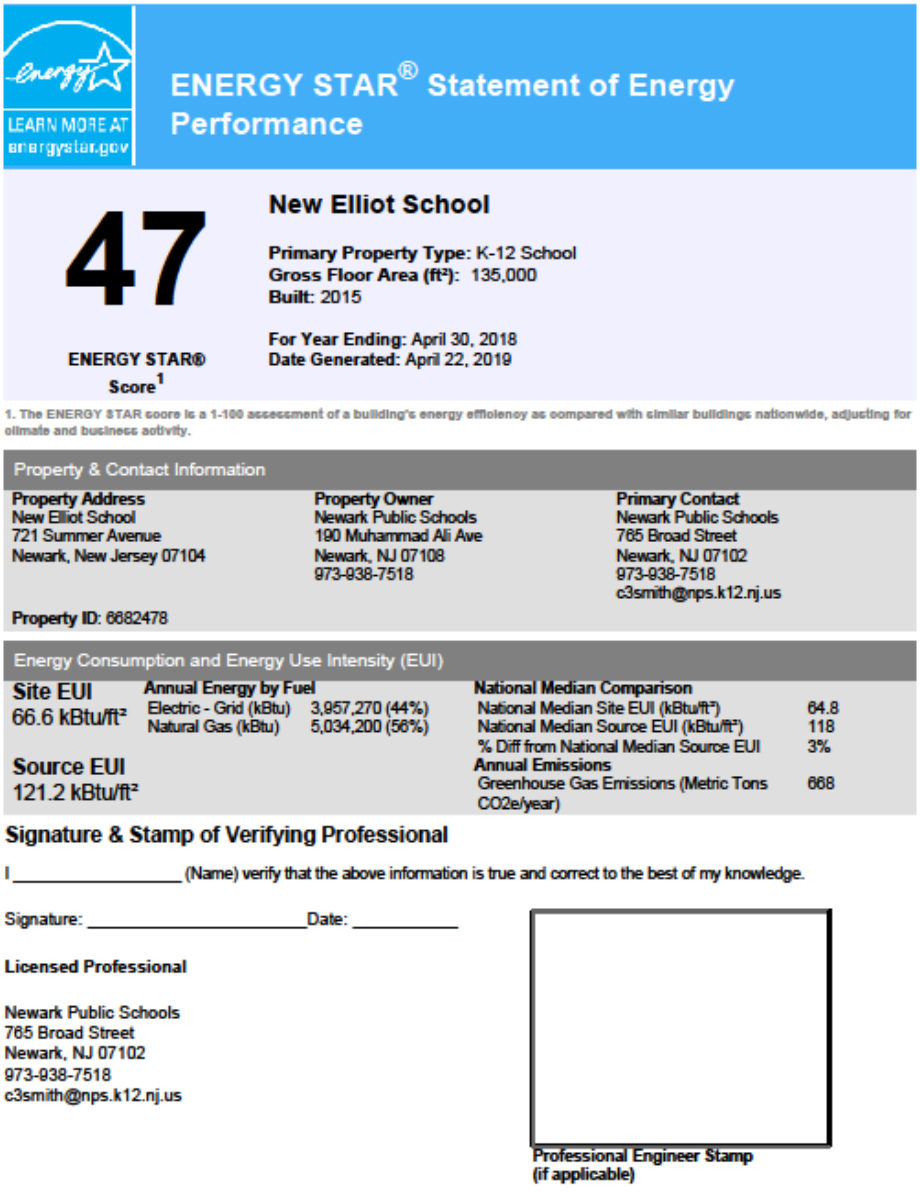
Energy savings range between 5% and 20% with a typical payback of two years or less

Based on a comprehensive study by the Environmental Protection Agency, the value of energy savings range from $0.11 and $0.72/sqft

This should include the following; Check Valve and Damper Operation, Economizer Controls, Temperature and Humidity Sensors, etc.

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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



LEARN MORE AT energystar.gov

ENERGY STAR® Statement of Energy Performance

47

ENERGY STAR® Score[1]

New Elliot School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 135,000
Built: 2015

For Year Ending: April 30, 2018
Date Generated: April 22, 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
New Elliot School 721 Summer Avenue Newark, New Jersey 07104	Newark Public Schools 190 Muhammad Ali Ave Newark, NJ 07108 973-938-7518	Newark Public Schools 765 Broad Street Newark, NJ 07102 973-938-7518 c3smith@nps.k12.nj.us

Property ID: 6682478

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
66.6 kBtu/ft²

Source EUI
121.2 kBtu/ft²

Annual Energy by Fuel		
Electric - Grid (kBtu)	3,957,270 (44%)
Natural Gas (kBtu)	5,034,200 (56%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	64.8
National Median Source EUI (kBtu/ft²)	118
% Diff from National Median Source EUI	3%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	668

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

Newark Public Schools
765 Broad Street
Newark, NJ 07102
973-938-7518
c3smith@nps.k12.nj.us

Professional Engineer Stamp (if applicable)

APPENDIX C: GLOSSARY

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

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

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