Local Government Energy Audit Report

Sayreville Middle School

February 8, 2019

Prepared for:

Sayreville Public Schools
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Parlin, NJ 08859

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Disclaimer

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

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

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

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

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

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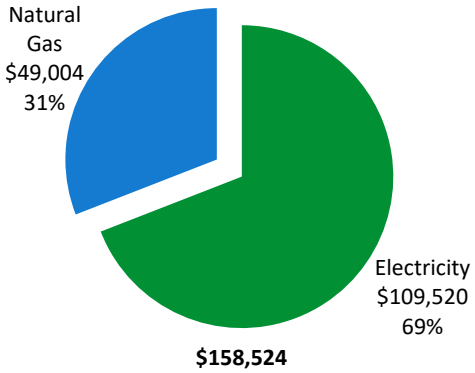
1 EXECUTIVE SUMMARY

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

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $158,524 Electricity: 855,437 kWh Natural Gas: 57,736 Therms	
ENERGY STAR® Benchmarking Score	70 *(1-100 scale)*	Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance and lower your energy bills even more.

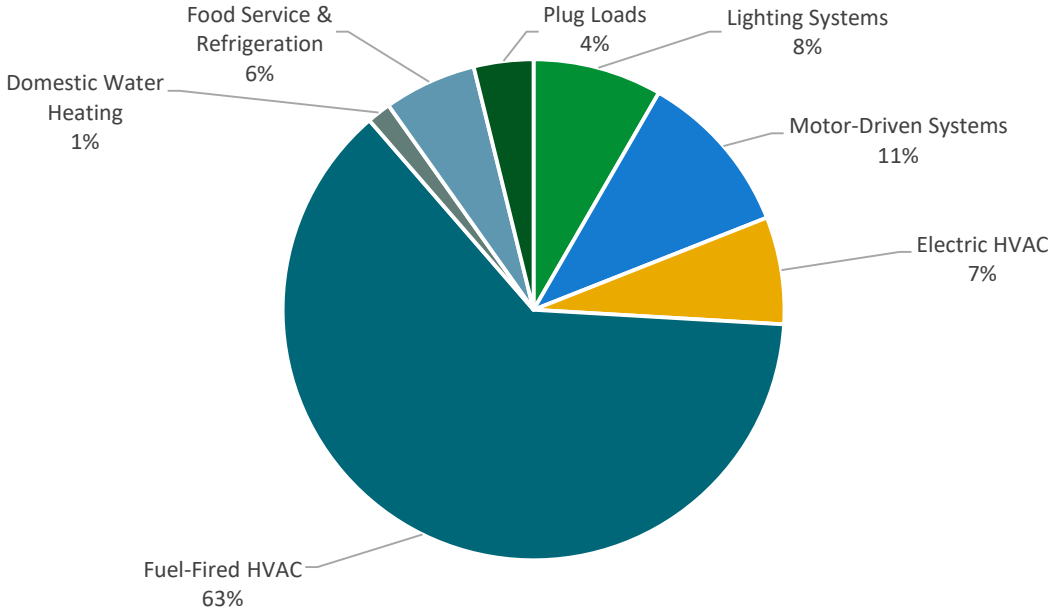


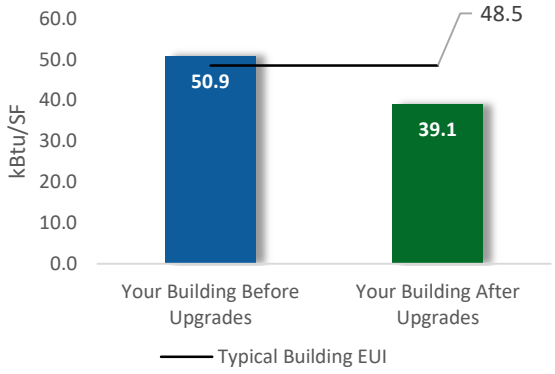
Figure 1 - Energy Use by System

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.

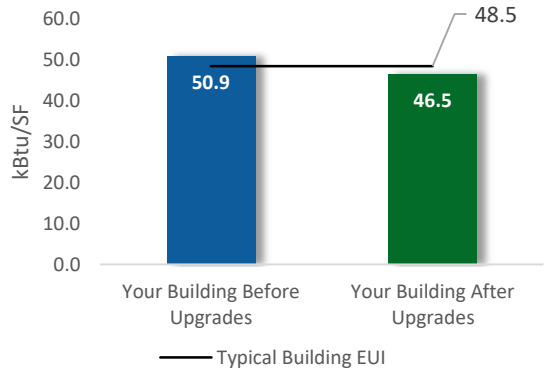
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$663,652
Potential Rebates & Incentives[1]	$25,423
Annual Cost Savings	$45,028
Annual Energy Savings	Electricity: 282,012 kWh Natural Gas: 10,512 Therms
Greenhouse Gas Emission Savings	204 Tons
Simple Payback	14.2 Years
Site Energy Savings (all utilities)	23%



Scenario 2: Cost Effective Package[2]

Installation Cost	$157,559
Potential Rebates & Incentives	$20,227
Annual Cost Savings	$27,359
Annual Energy Savings	Electricity: 212,024 kWh Natural Gas: 252 Therms
Greenhouse Gas Emission Savings	108 Tons
Simple Payback	5.0 Years
Site Energy Savings (all utilities)	9%



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		**90,794**	**32.6**	**-22**	**$11,442**	**$171,626**	**$83,921**	**$17,642**	**$66,279**	**5.8**	**88,911**
ECM 1	Install LED Fixtures	22,286	2.5	0	$2,853	$42,794	$16,322	$1,065	$15,257	5.3	22,438
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,255	1.2	-1	$282	$4,237	$1,956	$355	$1,601	5.7	2,185
ECM 3	Retrofit Fixtures with LED Lamps	66,254	28.9	-21	$8,306	$124,595	$65,643	$16,222	$49,421	5.9	64,289
Motor Upgrades		**4,845**	**1.2**	**0**	**$620**	**$9,304**	**$17,888**	**$0**	**$17,888**	**28.8**	**4,879**
ECM 4	Premium Efficiency Motors	4,845	1.2	0	$620	$9,304	$17,888	$0	$17,888	28.8	4,879
Variable Frequency Drive (VFD) Measures		**108,379**	**16.5**	**0**	**$13,876**	**$208,133**	**$52,961**	**$2,320**	**$50,641**	**3.6**	**109,137**
ECM 5	Install VFDs on Constant Volume (CV) Fans	25,451	8.3	0	$3,258	$48,876	$22,126	$2,320	$19,806	6.1	25,629
ECM 6	Install VFDs on Heating Water Pumps	82,928	8.2	0	$10,617	$159,257	$30,835	$0	$30,835	2.9	83,508
Electric Unitary HVAC Measures		**69,988**	**44.5**	**0**	**$8,960**	**$134,407**	**$299,114**	**$3,746**	**$295,369**	**33.0**	**70,478**
	Install High Efficiency Air Conditioning Units	69,988	44.5	0	$8,960	$134,407	$299,114	$3,746	$295,369	33.0	70,478
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**1,026**	**$8,708**	**$174,169**	**$206,979**	**$1,600**	**$205,379**	**23.6**	**120,134**
	Install High Efficiency Hot Water Boilers	0	0.0	987	$8,378	$167,552	$192,003	$400	$191,603	22.9	115,570
	Install High Efficiency Furnaces	0	0.0	39	$331	$6,617	$14,976	$1,200	$13,776	41.6	4,564
Domestic Water Heating Upgrade		**0**	**0.0**	**47**	**$397**	**$3,965**	**$122**	**$0**	**$122**	**0.3**	**5,470**
ECM 7	Install Low-Flow DHW Devices	0	0.0	47	$397	$3,965	$122	$0	$122	0.3	5,470
Food Service & Refrigeration Measures		**8,006**	**0.8**	**0**	**$1,025**	**$9,422**	**$2,667**	**$115**	**$2,552**	**2.5**	**8,062**
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	1,311	0.2	0	$168	$2,517	$303	$40	$263	1.6	1,320
ECM 9	Refrigeration Controls	1,860	0.1	0	$238	$3,810	$1,674	$75	$1,599	6.7	1,873
ECM 10	Vending Machine Control	4,836	0.6	0	$619	$3,095	$690	$150	$540	0.9	4,869
TOTALS		**282,012**	**95.5**	**1,051**	**$45,028**	**$711,027**	**$663,652**	**$25,423**	**$638,230**	**14.2**	**407,071**

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

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

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

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	x		x
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x		x
ECM 3	Retrofit Fixtures with LED Lamps	x		x
ECM 4	Premium Efficiency Motors	x		x
ECM 5	Install VFDs on Constant Volume (CV) HVAC	x		x
ECM 6	Install VFDs on Hot Water Pumps			x
ECM 7	Install Low-Flow Domestic Hot Water Devices	x		x
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	x		x
ECM 9	Refrigeration Controls	x		x
ECM 10	Vending Machine Control	x		x

Figure 3 – Funding Options

New Jersey 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. Peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Up to 25% of installation cost, calculated based on level of energy savings per square foot.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified partner to develop your energy reduction plan and set your energy savings targets.

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

Individual Measures with SmartStart

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

Turnkey Installation with Direct Install

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

Whole Building Approach with Pay for Performance

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

More Options from Around the State

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

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

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

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

Ongoing Electric Savings with Demand Response

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

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Sayreville Middle 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.

2.1 Site Overview

On August 24, 2018, TRC performed an energy audit at Sayreville Middle School located in Parlin, NJ. TRC met with Kenny to review the facility operations and help focus our investigation on specific energy-using systems.

Sayreville Middle School is a two-story, 170,847 square foot building built in 1968. Spaces include: classrooms, gymnasium/cafeteria, blue room, library, offices, kitchen, corridors, stairwells and mechanical rooms. The building is 100% heated and only about 10% cooled. The main operational and maintenance concerns include the condition of HVAC equipment (most is original to the building) and the old inefficient space heating boilers which are beyond their useful life.

The heating system includes finned tube radiators and unit ventilators throughout the building which are linked to the Automated Logic Building Energy Management System (EMS). The HVAC systems that serve the blue room & cafeteria are linked to the Metasys EMS. Lighting throughout the building includes traditional linear fluorescent technology. The gymnasium high bay fixtures use T5HO lamps which were installed 2-3 years ago. Half of the exterior pole-mounted and parking lot lighting is on the main electric meter and half are utility owned and maintained.

2.2 Building Occupancy

The facility is occupied year-round, the regular school year is September through June. Normal school days are Monday through Friday between 7:15 AM and 3:00 PM. Typical weekday building occupancy is about 1475 students and 200 staff members. There is after hours cleaning on weekdays where custodians occupy the building until 11:00 PM. The gymnasium/cafeteria is occasionally used on Saturdays. Summer school is in August and the building is occupied Monday through Thursday between 7:45 AM and 1:00 PM. Summer occupancy includes teachers, continuing maintenance and custodian activities.

Building Name	Weekday/Weekend	Operating Schedule
Classrooms & Offices	Weekday	7:00AM - 3:00PM
	Weekend	Unocupied
After Hours Cleaning	Weekday	3:00PM - 11:00PM
	Weekend	Unocupied
Gym & Cafeteria	Weekday	7:00AM - 3:00PM
	Weekend	Rare Use
Summer School in August (Monday through Thursday)	Weekday	7:45AM - 1:00PM
	Weekend	Unocupied

Figure 4 - Building Occupancy Schedule

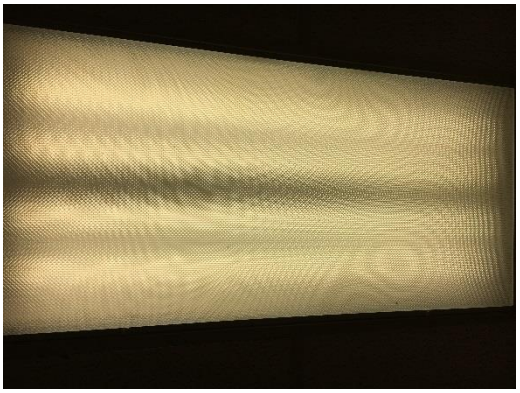
2.3 Building Envelope

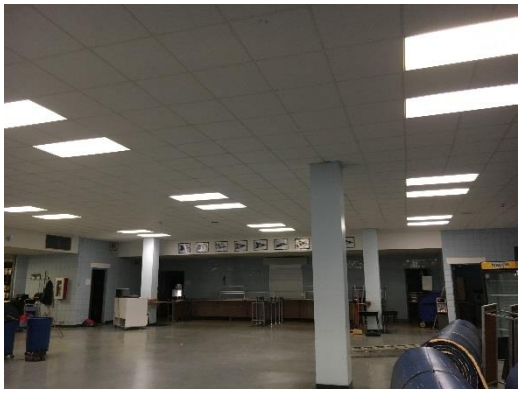
Building walls are concrete block over structural steel with a brick or stone facade. The roof is flat and appears to be in fair condition. There are areas of the building where exterior walls do not have insulation and in poor condition with cracks contributing to air infiltration. The majority of windows are single pane and operable with metal frames, clear glass with internal shading and in poor condition. The window frame caulk is deteriorated and exterior door weather-stripping is either missing or in poor condition. Degraded window and door seals increase drafts and outside air infiltration.

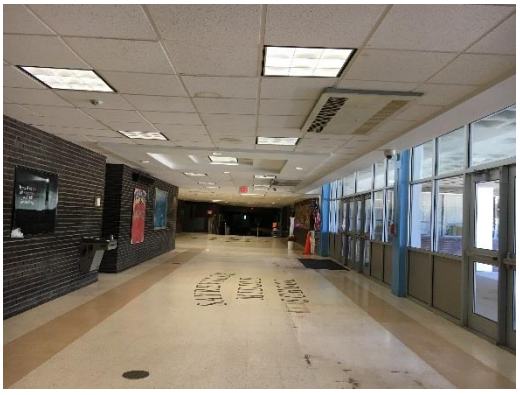
2.4 Lighting Systems

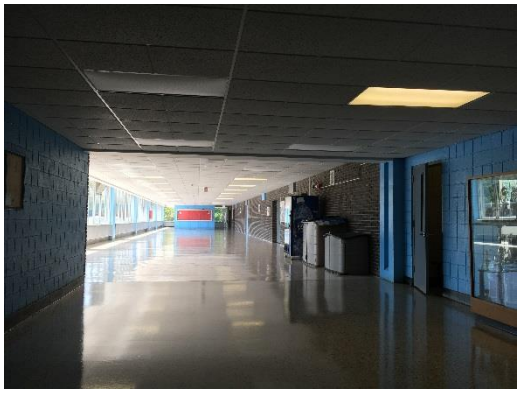
The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. Light fixtures are in fair condition, however some areas had fixtures in poor condition. Fixture types include 1 to 4-lamp, 2- or 4-foot long troffer and surface mounted wrap fixtures. There are several U-lamp T8 recessed troffer fixtures as well. Troffer fixtures have prismatic lenses or parabolic lenses. There are surface-mounted box fixtures in a few classrooms and the library. There are also compact fluorescent plug-in lamp fixtures. Fixture types include recessed can or wall mounted wrap fixtures in stairwells.

Gymnasium fixtures have high bay linear fluorescent T5 high output lamp fixtures and are controlled by fixture-mounted occupancy sensors. All exit signs are LED. Interior lighting levels were generally sufficient while there are a number of restrooms which are over lit.









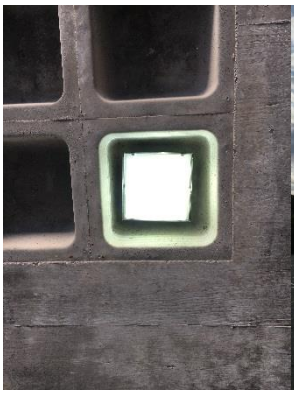



Lighting fixtures in the main office, most classrooms, some restrooms and the library are controlled by occupancy sensors. The remainder of the light fixtures are controlled by wall switches which include office space, work rooms, hallways, storage rooms, mechanical space, cafeteria, some restrooms and a few classrooms.

Typical Bi-Level Switching in Classrooms

Typical Ceiling Mounted Occupancy Sensor

Exterior fixtures include wall packs, flood lights, canopy lights and pole mounted area light fixtures. There is a mixture of technologies. HID fixtures include high pressure sodium or metal halide lamps. Some of these fixtures are missing lenses or in poor condition. General purpose fixtures include incandescent or compact fluorescent lamps. There are also a few fixtures that are LED technology. Exterior light fixtures are controlled by time clocks which are set for 7:00 PM to 7:00 AM operation.

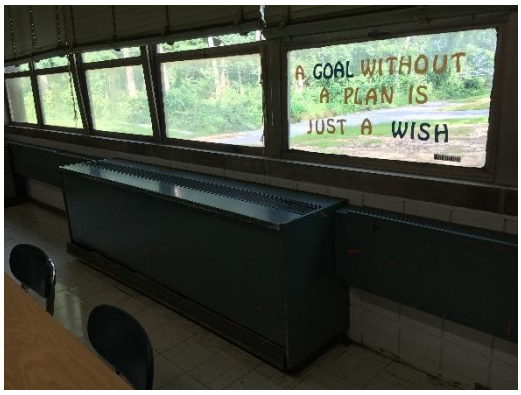


2.5 Air Handling Systems

The air side systems including packaged units, window air conditioners (ACs) and unit ventilators with fans are all summarized in this section.

Unit Ventilators

The older unit ventilators have 1/4 HP supply fan motors, pneumatically controlled outside air dampers and zone valves that operate with a pneumatic control system. This system is original to the building and appears to be in poor operating condition.

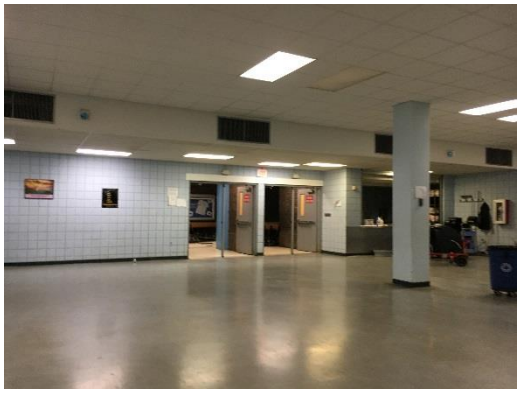


The newer unit ventilators have 1/6 HP supply fan motors, controlled outside air dampers and zone valves that operate with the EMS control system. These unit ventilators are equipped with economizers. They are set to operate weekdays between 5:30 AM and 3:00 PM. This system appears to be in fair operating condition.

Packaged Units

The cafeteria/gymnasium, blue room and some classrooms are served by packaged AC units with direct expansion (DX) coils and are controlled the EMS. The three units serving the classrooms utilize gas-fired burners which total to 661 MBH in heating capacity and 37.5 tons in cooling capacity. The two units serving the cafeteria/gymnasium and blue room are cooling-only units and total 90 tons in cooling capacity. The current operational condition of the economizers was unable to be verified. For the purposes of this report, the energy efficiency of these units has been de-rated due to the age of the equipment. The packaged roof top units are summarized in the table below:

Unit (Make & Model)	Area Served	Size (Tons)	Efficiency (EER)
Johnson Controls ZS-15N40B2C1AAA1A1	Classrooms	15	9.8
Johnson Controls ZS-15N40B2C1AAA1A1	Classrooms	15	9.8
Johnson Controls ZS-07N48NTAAA7A	Classrooms	7.5	9.8
AAON RK-30-2-FO (Cooling Only)	Blue Room	30	8.5
AAON RK-60-2-EO (Cooling Only)	Café/Gym	60	8.5



Split Air Conditioning (AC) Systems

There are a few split AC systems which are standard efficiency and in fair condition. They are manually controlled by a remote control. For the purposes of this report, the energy efficiency of these units has been de-rated due to the age of the equipment.

Air Conditioners

Offices and classrooms are also cooled by window AC units which are either near or beyond their useful life. The majority of ACs are 2-ton units and manually turned on and off as needed in the summer months. For the purposes of this report, the energy efficiency of these units has been de-rated due to the age of the equipment. Most are not ENERGY STAR® labeled.

2.6 Heating Hot Water Systems

There are three boiler rooms and hydronic heating systems. The first includes gas-fired, non-condensing hot water boilers which were installed in 2000 and are in poor condition. The second includes gas-fired, condensing hot water boilers which were installed in 2008 and are in good condition. The third includes a gas-fired, non-condensing hot water boiler that was installed in 2013 and in good condition. These systems and equipment serve the building heating load. The main boilers are configured in an automated lead-lag control scheme. For the purposes of this report, the efficiency of these units has been de-rated due to the age of the equipment. The boilers are summarized in the table below:

Location	Unit (Make & Model)	Area Served	Size (MBH)	Efficiency
Boiler Room #1	Universal Boiler Works BF-150W4-GP	Hydronic Heating	5,022	70.4%
Boiler Room #1	Universal Boiler Works BF-150W4-GP	Hydronic Heating	5,022	70.4%
Boiler Room #2	P-K Thermific N2000-MFD	"D" Wing	1,700	85.0%
Boiler Room #2	P-K Thermific N2000-MFD	"D" Wing	1,700	85.0%
Boiler Room #3	Weil McLain PFG-6-PIN	"E" Wing	215	70.5%

The hydronic distribution systems are heating only systems. The boilers are configured in a constant flow primary distribution. They include two 25 HP, two 7.5 HP and two 10 HP constant speed hot water pumps operating with an automated lead-lag control scheme. The boilers provide hot water to fin tube radiators, unit ventilators and heating-ventilation units throughout the building.

Hot water is supplied at 185°F when the building is occupied and the outside air temperature is at 10°F. The set point is adjusted linearly to 135°F when the outside air is at 55°F. Hot water is supplied at 170°F when the building is unoccupied and the outside air temperature is at 10°F. The set point is adjusted linearly to 130°F when the outside air is at 55°F. The hot water return temperature varies between 115°F and 150°F. The boilers are manually turned off for the season at the end of April when the outside temperature is above 55°F.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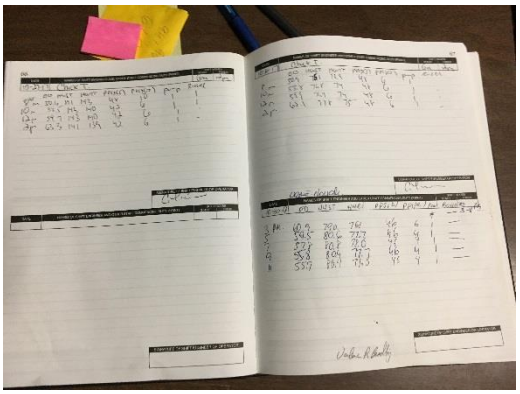
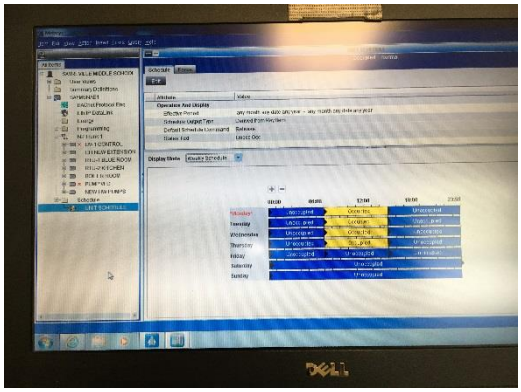



HOT WATER SUPPLY
MODU-FIRE FD

2.7 Building Energy Management Systems (EMS)

A Metasys EMS controls the boilers, unit ventilators and two packaged AC units. The EMS provides equipment scheduling control and monitors space temperatures, heating water loop temperatures, valve percent opened and pump status. The three packaged RTUs are controlled by basic timer controls.



2.8 Domestic Hot Water

Hot water is produced with two 119-gallon, 520 MBH gas-fired storage water heaters with an 80% thermal efficiency. There is also a small 30-gallon, 3kW electric storage water heater in a second floor mechanical room. At the time of the site visit, the domestic water heaters were set at 120°F. Fractional horsepower circulation pumps distribute water to end uses. The circulation pumps are likely to operate continuously. The domestic hot water pipes are insulated and the insulation is in fair condition.

2.9 Food Service Equipment

The kitchen has mixed gas and electric equipment that is used to prepare meals for students. Most cooking is done using a gas rack oven and an electric convection oven. Bulk prepared foods are held in several electric holding cabinets. Equipment is high efficiency and in good condition. The dishwasher is a standard efficiency single tank conveyor high temperature unit.

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

2.10 Refrigeration

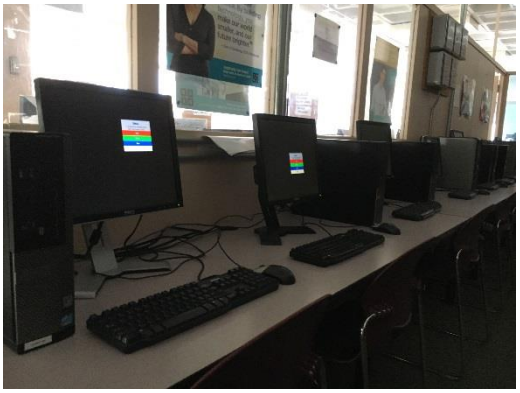
The kitchen has several stand-up refrigerators with either solid or glass doors and standard to high efficiency and in good condition. There are also refrigerator chests that are not energy efficient and in fair condition. There is a walk-in cooler as well as a walk-in low temperature freezer. These have an estimated 2-ton compressor and a single fan evaporator. There is also an icemaker in the nurse's office.

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

2.11 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 4% percent of total building energy use. This is lower than a typical building. You seem to already be doing a great job managing your electrical plug loads. This report makes additional suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are approximately 123 computer work stations throughout the facility. Plug loads throughout the building include general café and office equipment. There are classroom typical loads such as smart boards, projectors, and fans. There are several residential style refrigerators throughout the building. These vary in condition and efficiency. There are three refrigerated beverage vending machines and one non-refrigerated vending machine. Vending machines are not equipped with occupancy-based controls.



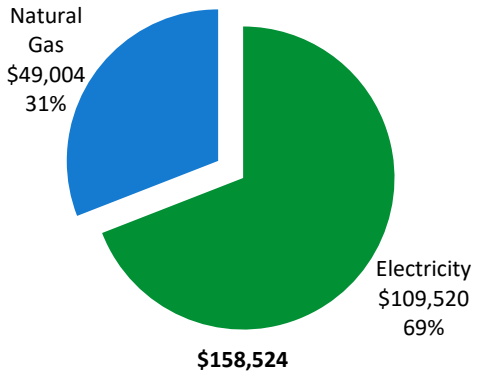
2.12 Water-Using Systems

There are restrooms with toilets, urinals, and sinks. Faucet flow rates are either low flow at 0.5 gallons per minute (gpm) or high flow at 2.2 gpm. Toilets and urinals are rated for standard flow rates.

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	855,437 kWh	$109,520
Natural Gas	57,736 Therms	$49,004
Total		**$158,524**



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

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

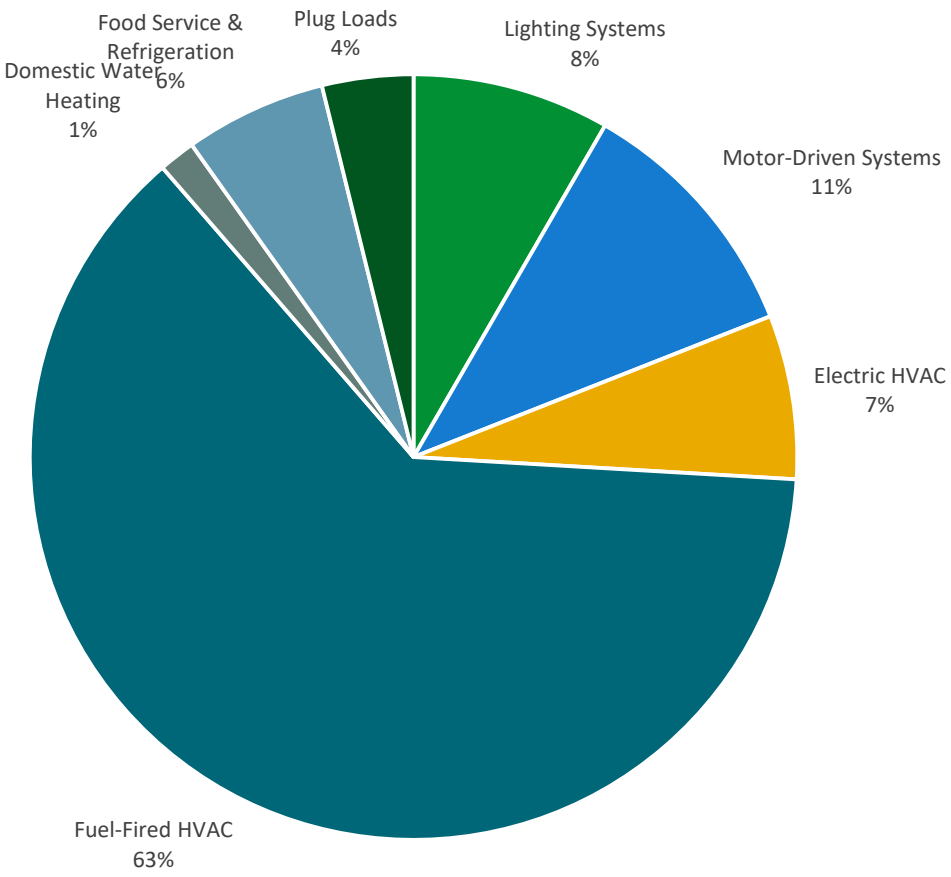
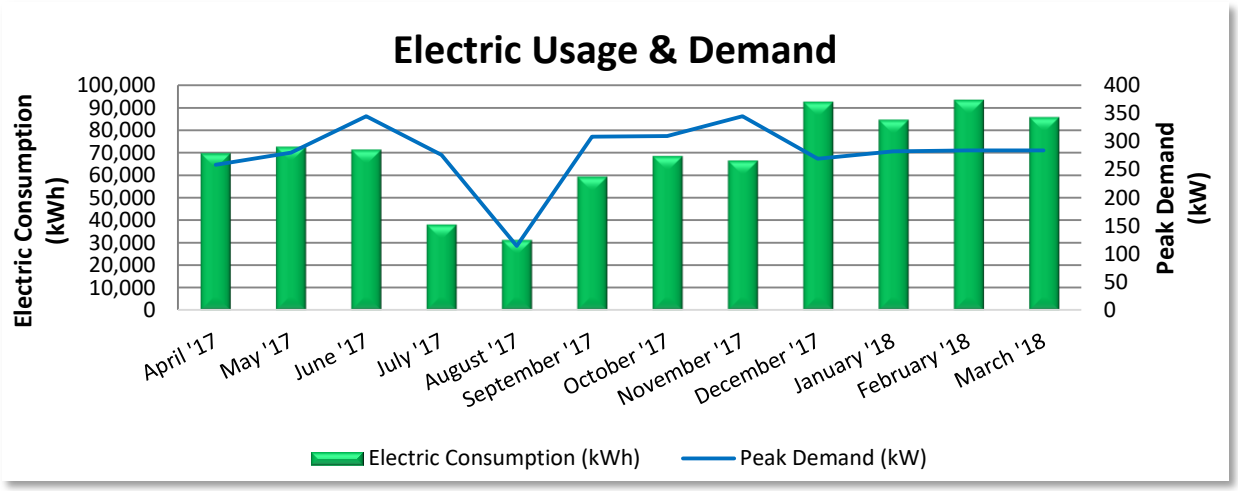


Figure 5 - Energy Balance

3.1 Electricity

JCP&L supplies & delivers electricity under rate class General Service Secondary 3 Phase.



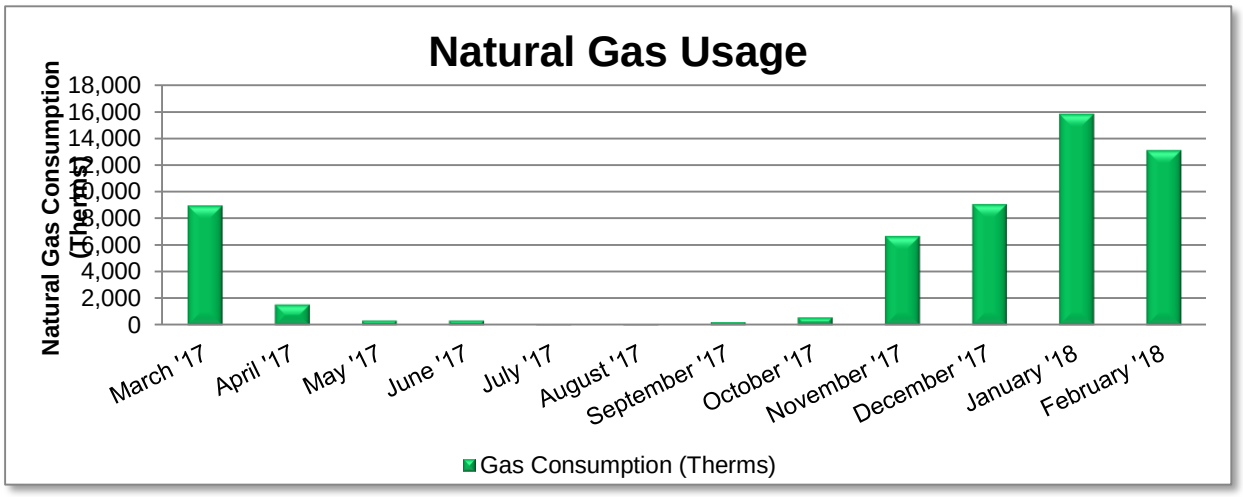
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
4/17/17	30	69,600	259	$1,647	$8,895
5/17/17	29	72,400	280	$1,790	$9,327
6/19/17	32	71,200	345	$2,377	$9,724
7/19/17	29	38,000	276	$1,891	$5,849
8/17/17	28	31,200	114	$718	$5,357
9/19/17	32	59,200	309	$2,121	$8,200
10/19/17	29	68,400	310	$1,986	$8,939
11/16/17	27	66,400	345	$2,219	$8,946
12/19/17	32	92,400	270	$1,719	$11,017
1/17/18	28	84,400	282	$1,800	$9,773
2/16/18	29	93,200	284	$1,080	$10,602
3/19/18	30	85,600	284	$1,811	$9,891
Totals	**355**	**832,000**	**345**	**$21,160**	**$106,519**
Annual	**365**	**855,437**	**345**	**$21,756**	**$109,520**

Notes:

- Peak demand of 345 kW occurred in February 2018.
- The average electric cost over the past 12 months was $0.128/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.
- Low occupancy in the summer months is demonstrated by the reduced electrical usage in August and July.

3.2 Natural Gas

PSE&G delivers natural gas under rate class GSG, with natural gas supply provided by Direct Energy, a third-party supplier.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
4/4/17	29	8,970	$5,715
5/3/17	29	1,563	$1,088
6/2/17	30	377	$345
7/5/17	33	379	$359
8/3/17	29	41	$129
8/31/17	28	99	$170
10/3/17	28	243	$262
10/31/17	28	607	$628
12/1/17	31	6,684	$5,952
1/3/18	33	9,062	$7,941
2/1/18	29	15,811	$13,872
3/6/18	33	13,107	$11,871
Totals	**360**	**56,945**	**$48,332**
Annual	**365**	**57,736**	**$49,004**

Notes:

- The average gas cost for the past 12 months is $0.849/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 Portfolio Manager® software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

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

Benchmarking Score	**70**

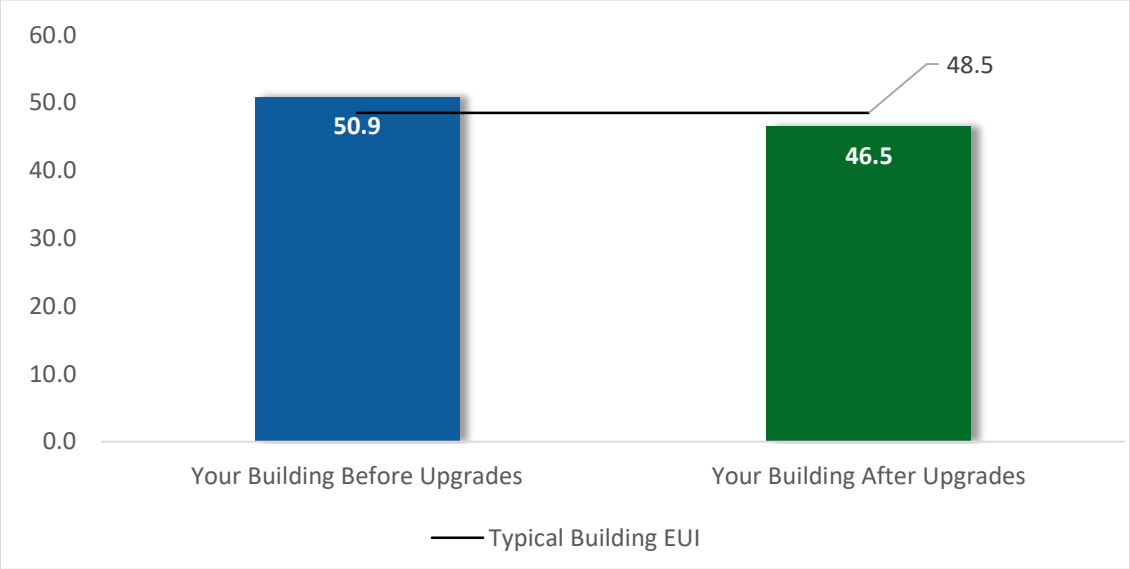


Figure 6 - Energy Use Intensity Comparison

Congratulations, your building performs better than a typical building of this type. This report has suggestions about how to keep your building running efficiently, further improve performance, and lower your energy bills even more.

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

Tracking Your Energy Performance

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

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

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

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[3].

[3] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 Energy Conservation Measures

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

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

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

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

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

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**90,794**	**32.6**	**-22**	**$11,442**	**$83,921**	**$17,642**	**$66,279**	**5.8**	**88,911**
ECM 1	Install LED Fixtures	22,286	2.5	0	$2,853	$16,322	$1,065	$15,257	5.3	22,438
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,255	1.2	-1	$282	$1,956	$355	$1,601	5.7	2,185
ECM 3	Retrofit Fixtures with LED Lamps	66,254	28.9	-21	$8,306	$65,643	$16,222	$49,421	5.9	64,289
Motor Upgrades		**4,845**	**1.2**	**0**	**$620**	**$17,888**	**$0**	**$17,888**	**28.8**	**4,879**
ECM 4	Premium Efficiency Motors	4,845	1.2	0	$620	$17,888	$0	$17,888	28.8	4,879
Variable Frequency Drive (VFD) Measures		**108,379**	**16.5**	**0**	**$13,876**	**$52,961**	**$2,320**	**$50,641**	**3.6**	**109,137**
ECM 5	Install VFDs on Constant Volume (CV) Fans	25,451	8.3	0	$3,258	$22,126	$2,320	$19,806	6.1	25,629
ECM 6	Install VFDs on Heating Water Pumps	82,928	8.2	0	$10,617	$30,835	$0	$30,835	2.9	83,508
Electric Unitary HVAC Measures		**69,988**	**44.5**	**0**	**$8,960**	**$299,114**	**$3,746**	**$295,369**	**33.0**	**70,478**
	Install High Efficiency Air Conditioning Units	69,988	44.5	0	$8,960	$299,114	$3,746	$295,369	33.0	70,478
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**1,026**	**$8,708**	**$206,979**	**$1,600**	**$205,379**	**23.6**	**120,134**
	Install High Efficiency Hot Water Boilers	0	0.0	987	$8,378	$192,003	$400	$191,603	22.9	115,570
	Install High Efficiency Furnaces	0	0.0	39	$331	$14,976	$1,200	$13,776	41.6	4,564
Domestic Water Heating Upgrade		**0**	**0.0**	**47**	**$397**	**$122**	**$0**	**$122**	**0.3**	**5,470**
ECM 7	Install Low-Flow DHW Devices	0	0.0	47	$397	$122	$0	$122	0.3	5,470
Food Service & Refrigeration Measures		**8,006**	**0.8**	**0**	**$1,025**	**$2,667**	**$265**	**$2,402**	**2.3**	**8,062**
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	1,311	0.2	0	$168	$303	$40	$263	1.6	1,320
ECM 9	Refrigeration Controls	1,860	0.1	0	$238	$1,674	$75	$1,599	6.7	1,873
ECM 10	Vending Machine Control	4,836	0.6	0	$619	$690	$150	$540	0.9	4,869
TOTALS		**282,012**	**95.5**	**1,051**	**$45,028**	**$663,652**	**$25,573**	**$638,080**	**14.2**	**407,071**

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

** - 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		**90,794**	**32.6**	**-22**	**$11,442**	**$83,921**	**$17,642**	**$66,279**	**5.8**	**88,911**
ECM 1	Install LED Fixtures	22,286	2.5	0	$2,853	$16,322	$1,065	$15,257	5.3	22,438
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,255	1.2	-1	$282	$1,956	$355	$1,601	5.7	2,185
ECM 3	Retrofit Fixtures with LED Lamps	66,254	28.9	-21	$8,306	$65,643	$16,222	$49,421	5.9	64,289
Motor Upgrades		**4,845**	**1.2**	**0**	**$620**	**$17,888**	**$0**	**$17,888**	**28.8**	**4,879**
ECM 4	Premium Efficiency Motors	4,845	1.2	0	$620	$17,888	$0	$17,888	28.8	4,879
Variable Frequency Drive (VFD) Measures		**108,379**	**16.5**	**0**	**$13,876**	**$52,961**	**$2,320**	**$50,641**	**3.6**	**109,137**
ECM 5	Install VFDs on Constant Volume (CV) Fans	25,451	8.3	0	$3,258	$22,126	$2,320	$19,806	6.1	25,629
ECM 6	Install VFDs on Heating Water Pumps	82,928	8.2	0	$10,617	$30,835	$0	$30,835	2.9	83,508
Domestic Water Heating Upgrade		**0**	**0.0**	**47**	**$397**	**$122**	**$0**	**$122**	**0.3**	**5,470**
ECM 7	Install Low-Flow DHW Devices	0	0.0	47	$397	$122	$0	$122	0.3	5,470
Food Service & Refrigeration Measures		**8,006**	**0.8**	**0**	**$1,025**	**$2,667**	**$265**	**$2,402**	**2.3**	**8,062**
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	1,311	0.2	0	$168	$303	$40	$263	1.6	1,320
ECM 9	Refrigeration Controls	1,860	0.1	0	$238	$1,674	$75	$1,599	6.7	1,873
ECM 10	Vending Machine Control	4,836	0.6	0	$619	$690	$150	$540	0.9	4,869
TOTALS		**212,024**	**51.1**	**25**	**$27,359**	**$157,559**	**$20,227**	**$137,332**	**5.0**	**216,459**

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

** - 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		**90,794**	**32.6**	**-22**	**$11,442**	**$83,921**	**$17,642**	**$66,279**	**5.8**	**88,911**
ECM 1	Install LED Fixtures	22,286	2.5	0	$2,853	$16,322	$1,065	$15,257	5.3	22,438
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,255	1.2	-1	$282	$1,956	$355	$1,601	5.7	2,185
ECM 3	Retrofit Fixtures with LED Lamps	66,254	28.9	-21	$8,306	$65,643	$16,222	$49,421	5.9	64,289

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

ECM 1: Install LED Fixtures

Replace existing interior hallway fixtures in poor condition and exterior fixtures containing HID, fluorescent, or incandescent lamps with new LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output. In some cases HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixtures. The energy and economic results for this measure assume full replacement. Maintenance savings may also be achieved since LED lamps last longer than other light sources and therefore do not need to be replaced as often.

Affected building areas: interior hallway fixtures and all exterior fixtures

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Retrofit fluorescent fixtures in the over lit restrooms by removing the fluorescent tubes and ballasts and replacing them with a reduced number of LED tubes, an LED driver and retrofit kit (if necessary). The measure uses the existing fixture housing but replaces the electric components with more efficient lighting technology which use less power than other lighting technologies but provides equivalent lighting output. Maintenance savings may also be achieved since LED tubes last longer than fluorescent tubes and therefore do not need to be replaced as often.

Affected building areas: interior restroom fixtures

ECM 3: Retrofit Fixtures with LED Lamps

Replace linear and compact fluorescent or incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as a direct replacement for most other lighting technologies. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all interior areas with fluorescent fixtures with T8 tubes, plug in CFL lamps and T5 high output lamps as well as exterior incandescent lamp fixtures

4.2 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**4,845**	**1.2**	**0**	**$620**	**$17,888**	**$0**	**$17,888**	**28.8**	**4,879**
ECM 4	Premium Efficiency Motors	4,845	1.2	0	$620	$17,888	$0	$17,888	28.8	4,879

ECM 4: Premium Efficiency Motors

Replace standard efficiency motors with IHP 2014 efficiency motors. This evaluation assumes that existing motors will be replaced with motors of equivalent size and type. In some cases, additional savings may be possible by downsizing motors to better meet the motor's current load requirements. This measure is recommended as it is coupled with the variable frequency drive (VFD) measures that follow.

Affected motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor
Boiler Room #1	Hydronic Heating	2	Heating Hot Water Pump	25.0
Boiler Room #1	Hydronic Heating	2	Heating Hot Water Pump	7.5
Boiler Room #1	Boiler Burners	2	Boiler Feed Water Pump	5.0
Boiler Room #2	Hydronic Heating	2	Heating Hot Water Pump	10.0
Roof	Classrooms	1	Supply Fan	5.0
Roof	Classrooms	1	Supply Fan	5.0
Roof	Classrooms	1	Supply Fan	3.0
Blue Room	HV Units	2	Supply Fan	5.0
Gym	HV Units	2	Supply Fan	3.0

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

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**108,379**	**16.5**	**0**	**$13,876**	**$52,961**	**$2,320**	**$50,641**	**3.6**	**109,137**
ECM 5	Install VFDs on Constant Volume (CV) Fans	25,451	8.3	0	$3,258	$22,126	$2,320	$19,806	6.1	25,629
ECM 6	Install VFDs on Heating Water Pumps	82,928	8.2	0	$10,617	$30,835	$0	$30,835	2.9	83,508

Variable frequency drives control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor —unless the existing motor meets or exceeds IHP 2014 standards—to conservatively account for the cost of an inverter duty rated motor. The savings and cost associated with the new motor are presented with the Premium Efficiency Motor measures. If the proposed VFD measure is not selected for implementation the motor replacement should be reevaluated.

ECM 5: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one. Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature. For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

ECM 6: Install VFDs on Heating Water Pumps

Install variable frequency drives (VFD) to control heating water pumps. Two-way valves must serve the hot water coils and the hot water loop must have a differential pressure sensor installed. If three-way valves or a bypass leg are used in the hot water distribution they will need to be modified when this measure is implemented. As the hot water valves close, the differential pressure increases and the VFD modulates the pump speed to maintain a differential pressure setpoint.

Energy savings result from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

4.4 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		**69,988**	**44.5**	**0**	**$8,960**	**$299,114**	**$3,746**	**$295,369**	**33.0**	**70,478**
	Install High Efficiency Air Conditioning Units	69,988	44.5	0	$8,960	$299,114	$3,746	$295,369	33.0	70,478

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

Install High Efficiency Air Conditioning Units

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

Reasons for not Recommending as a High Priority Measure: The projected payback period for this measure based on the energy savings exceeds the expected useful life of the replacement equipment. The upgrade to high efficiency is not justified by energy savings alone.

Considerations: If the school district moves forward toward implementation of a comprehensive project under the ESIP, we would recommend including this measure.

4.5 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		**0**	**0.0**	**1,026**	**$8,708**	**$206,979**	**$1,600**	**$205,379**	**23.6**	**120,134**
	Install High Efficiency Hot Water Boilers	0	0.0	987	$8,378	$192,003	$400	$191,603	22.9	115,570
	Install High Efficiency Furnaces	0	0.0	39	$331	$14,976	$1,200	$13,776	41.6	4,564

Replacing the space heating boilers and gas-fired roof top units has a long payback period and may not be justifiable based simply on energy considerations. However, some of the units at this facility are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high efficiency unit can be justified by the marginal savings from the improved efficiency. When this equipment is eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

Install High Efficiency Hot Water Boilers

Replace older inefficient hot water boilers with high efficiency hot water boilers. Energy savings results from improved combustion efficiency and reduced standby losses at low loads. For the purposes of this analysis, we evaluated the replacement of boilers on a one-for-one basis with equipment of the same capacity.

The most notable efficiency improvement is condensing hydronic boilers which can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers are evaluated when the return water temperature is less than 130°F during most of the operating hours.

Reasons for not Recommending as a High Priority Measure: The projected payback period for this measure based on the energy savings exceeds the expected useful life of the replacement equipment. The upgrade to high efficiency is not justified by energy savings alone.

Considerations: If the school district moves forward toward implementation of a comprehensive project under the ESIP, we would recommend including this measure. We recommend that you work with your mechanical design team to select boilers that are sized appropriately for the heating load at this facility. In many cases installing multiple modular boilers rather than one or two large boilers will result in higher overall plant efficiency while providing additional system redundancy.

Install High Efficiency Furnaces

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

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

Reasons for not Recommending as a High Priority Measure: The projected payback period for this measure based on the energy savings exceeds the expected useful life of the replacement equipment. The upgrade to high efficiency is not justified by energy savings alone.

Considerations: If the school district moves forward toward implementation of a comprehensive project under the ESIP, we would recommend including this measure.

4.6 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**47**	**$397**	**$122**	**$0**	**$122**	**0.3**	**5,470**
ECM 7	Install Low-Flow DHW Devices	0	0.0	47	$397	$122	$0	$122	0.3	5,470

ECM 7: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The existing high flow aerators are recommended to be replaced with low flow 0.5 gpm devices to reduce hot water usage. Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing. Additional cost savings may result from reduced water usage.

Affected building areas: all faucets in the facility

4.7 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		**8,006**	**0.8**	**0**	**$1,025**	**$2,667**	**$115**	**$2,552**	**2.5**	**8,062**
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	1,311	0.2	0	$168	$303	$40	$263	1.6	1,320
ECM 9	Refrigeration Controls	1,860	0.1	0	$238	$1,674	$75	$1,599	6.7	1,873
ECM 10	Vending Machine Control	4,836	0.6	0	$619	$690	$150	$540	0.9	4,869

ECM 8: Refrigerator/Freezer Case Electrically Commutated Motors

Replace shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in walk-in coolers. Fractional horsepower EC motors are significantly more efficient than mechanically commutated, brushed motors, particularly at low speeds or partial load. By using variable-speed technology, EC motors can optimize fan usage. Because these motors are brushless and use direct current (DC) power, losses due to friction and phase shifting are eliminated. Savings for this measure consider both the increased efficiency of the motor as well as the reduction in refrigeration load due to motor heat loss.

ECM 9: Refrigeration Controls

Install additional controls to optimize the operation of the walk-in cooler. Many walk-in coolers have evaporator fans that run continuously. The measure adds a control system feature to automatically shut off evaporator fans when not needed. Energy savings for each of the control measures account for reduction in compressor and fan operating hours as well as reduction in the refrigeration heat load as appropriate.

ECM 10: Vending Machine Control

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

5 Energy Efficient Best Practices

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

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions.[4] Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Weatherization

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

Doors and Windows

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

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 Controls

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

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

Motor 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.

Destratification Fans

For areas with high ceilings, destratification fans fair 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.

Thermostat Schedules and Temperature Resets

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

Economizer Maintenance

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

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

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.

Furnace Maintenance

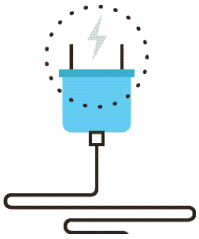
Preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should: check for gas / carbon monoxide leaks; change the air and fuel filters; check components for cracks, corrosion, dirt,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

Water Heater Maintenance

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

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

Plug Load Controls



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

Computer Power Management Software

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

Water Conservation

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

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

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

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

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

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[5] For additional information refer to "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

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

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

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 On-site Generation

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

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

6.1 Solar Photovoltaic

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

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

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

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

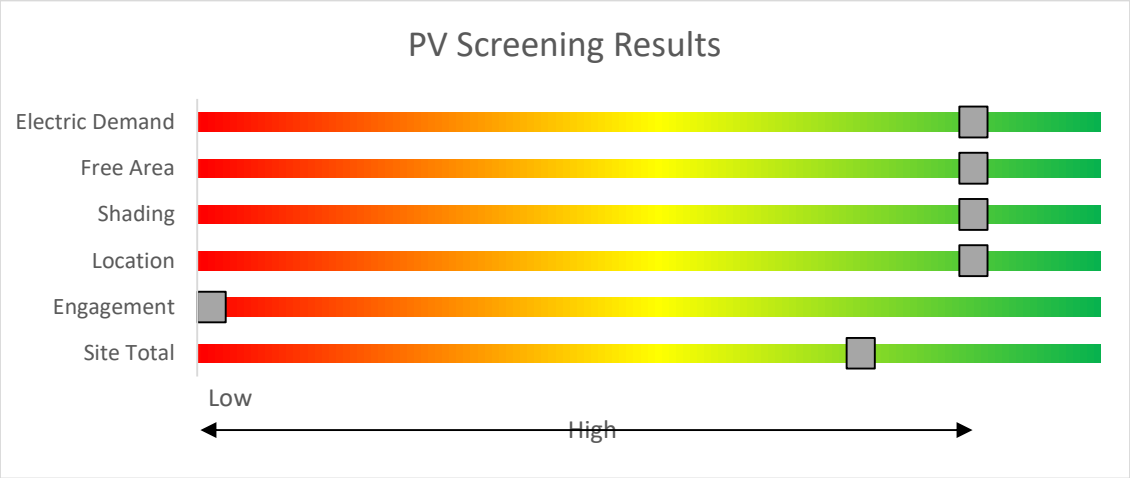

Figure 9 - Photovoltaic Screening

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

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

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

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

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

6.2 Combined Heat and Power

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

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

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

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has **low potential** for installing a cost-effective CHP system.

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

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

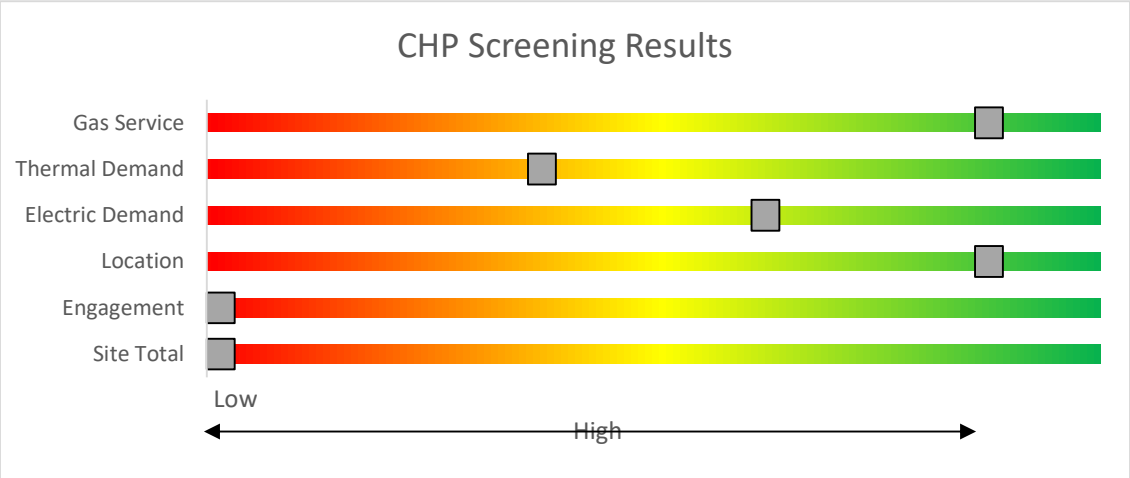

Figure 10 - Combined Heat and Power Screening

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

7 PROJECT FUNDING AND INCENTIVES

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

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

Incentives

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

How to Participate

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

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

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

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

Incentives

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

How to Participate

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

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

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

7.4 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.

7.5 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey SRECs. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

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

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

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

8 Energy Purchasing and Procurement Strategies

8.1 Retail Electric Supply Options

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

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

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

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
Main Office	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,283	3	Relamp	No	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,283	0.3	459	0	$58	$657	$180	8.3
Main Office	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	15	0	$2	$33	$6	14.5
Boiler Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.1	349	0	$44	$292	$80	4.9
Locker Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	44	0	$5	$37	$10	4.9
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,860	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,860	0.0	21	0	$3	$33	$6	10.0
Hallway	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.1	193	0	$24	$146	$40	4.4
Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	2,060	3	Relamp	No	5	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,060	0.1	410	0	$51	$365	$100	5.2
Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	1	Fixture Replacement	No	2	LED - Fixtures: Ambient - 3' - Direct Fixture	Wall Switch	29	2,060	0.0	97	0	$12	$730	$60	55.4
Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.3	869	0	$109	$657	$180	4.4
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	131	0	$16	$110	$30	4.9
Custodial Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Classroom B15	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.3	481	0	$60	$584	$160	7.0
Kitchenette	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	44	0	$5	$37	$10	4.9
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Classroom B13	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.3	541	0	$68	$657	$180	7.0
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Classroom B16	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom B17	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom B18	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom B19	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom B8	30	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	30	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.3	478	0	$60	$548	$150	6.6
Classroom B8	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Lounge B7	30	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	30	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.3	478	0	$60	$548	$150	6.6
Lounge B7	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	128	0	$16	$146	$40	6.6

	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
Closets (2 Total)	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Storage B6	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Art Classroom B5	27	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	27	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.2	624	0	$78	$493	$135	4.6
Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	O	114	1,283	2	Delamp & Add Reflectors	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.2	321	0	$40	$453	$75	9.4
Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	O	114	1,283	2	Delamp & Add Reflectors	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.1	257	0	$32	$183	$60	3.8
Nurse's Office B2	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	9	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.1	208	0	$26	$164	$45	4.6
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,860	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	5	0	$1	$37	$10	40.1
Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	S	22	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	10	0	$1	$18	$5	10.7
Resting Rooms (3 Total)	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	69	0	$9	$55	$15	4.6
Resting Rooms (3 Total)	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.1	261	0	$33	$219	$60	4.9
Blue Room	12	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	S	62	2,060	3	Relamp	No	12	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,060	0.2	509	0	$64	$870	$120	11.8
Blue Room	43	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,060	3	Relamp	No	43	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,060	0.7	2,075	-1	$260	$1,570	$430	4.4
Copy Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	131	0	$16	$110	$30	4.9
Cafeteria	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	32	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.5	1,545	-1	$193	$1,168	$320	4.4
Lounge	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	120	0	$15	$146	$40	7.0
Serving Area	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.2	523	0	$66	$438	$120	4.9
Kitchen AC1	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	9	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.1	208	0	$26	$164	$45	4.6
Kitchen AC2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Walk Ins	2	Compact Fluorescent: Screw in Lamp	Wall Switch	S	13	1,860	3	Relamp	No	2	LED Screw-In Lamps: Screw in Lamp	Wall Switch	9	1,860	0.0	11	0	$1	$34	$0	26.0
Office	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	1,860	0.0	42	0	$5	$65	$12	10.0
Kitchen	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	30	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.5	1,307	0	$164	$1,095	$300	4.9
Locker Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,860	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,860	0.0	65	0	$8	$55	$15	4.9
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6

	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
Hallway	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,060	3	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,060	0.1	434	0	$54	$329	$90	4.4
Hallway	38	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,060	3	Relamp	No	38	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,060	0.9	2,751	-1	$345	$2,081	$570	4.4
Hallway	32	Compact Fluorescent: Plug in Lamp	Occupancy Sensor	S	32	2,060	3	Relamp	No	32	LED Screw-In Lamps: Plug in Lamp	Occupancy Sensor	22	2,060	0.2	468	0	$59	$1,102	$0	18.8
Hallway	12	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Occupancy Sensor	S	53	2,060	3	Relamp	No	12	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	2,060	0.2	483	0	$60	$585	$108	7.9
Hallway	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,060	3	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,060	0.1	290	0	$36	$219	$60	4.4
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,283	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,283	0.1	102	0	$13	$146	$40	8.3
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	S	114	1,283	3	Relamp	No	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,283	0.1	102	0	$13	$146	$40	8.3
Boiler Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Stairs	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.0	145	0	$18	$110	$30	4.4
Stairs	4	Compact Fluorescent: Plug in Lamp	Wall Switch	S	32	2,060	3	Relamp	No	4	LED Screw-In Lamps: Plug in Lamp	Wall Switch	22	2,060	0.0	59	0	$7	$138	$0	18.8
Walkway	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.0	145	0	$18	$110	$30	4.4
Hallway	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.2	724	0	$91	$548	$150	4.4
Hallway	21	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	2,060	3	Relamp	No	21	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,060	0.2	491	0	$62	$683	$126	9.0
Custodial Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Boiler Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	44	0	$5	$37	$10	4.9
Classroom 501	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 501	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 501	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 502	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 502	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 502	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 503	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 503	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 503	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 504	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0

	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
Classroom 504	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 504	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 505	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 505	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 505	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 506	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 506	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 506	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 507	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 507	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 507	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 508	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 508	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 508	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 509	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 509	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 509	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 510	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 510	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 510	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 511	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 511	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 511	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 512	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 512	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5

	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 512	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 513	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 513	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 513	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 514	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 514	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 514	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 515	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 515	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 515	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 516	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 516	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 516	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 517	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 517	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 517	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 518	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 518	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 518	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 519	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 519	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 519	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6
Classroom 520	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.1	180	0	$23	$219	$60	7.0
Classroom 520	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	S	33	1,283	3	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	29	0	$4	$65	$12	14.5
Classroom 520	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.0	64	0	$8	$73	$20	6.6

	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
Hallway	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,060	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,060	0.1	193	0	$24	$146	$40	4.4
Stairwells (2 Total)	14	Compact Fluorescent: Plug in Lamp	Wall Switch	S	32	2,060	3	Relamp	No	14	LED Screw-In Lamps: Plug in Lamp	Wall Switch	22	2,060	0.1	205	0	$26	$482	$0	18.8
Faculty Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	44	0	$5	$37	$10	4.9
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Hallway	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,060	3	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,060	0.3	869	0	$109	$657	$180	4.4
Storage C22	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.1	305	0	$38	$256	$70	4.9
Classroom C6	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C9	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C10	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C11	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C12	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C13	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C14	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C15	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C16	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C17	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C18	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C19	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C20	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C21	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Tech Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	131	0	$16	$110	$30	4.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Server Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Stairwell	7	Compact Fluorescent: Plug in Lamp	Wall Switch	S	32	2,060	3	Relamp	No	7	LED Screw-In Lamps: Plug in Lamp	Wall Switch	22	2,060	0.0	102	0	$13	$241	$0	18.8
Faculty Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	44	0	$5	$37	$10	4.9
2nd Floor Hallway	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.1	386	0	$48	$292	$80	4.4
Foyer Hallway	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	27	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.4	1,303	0	$163	$986	$270	4.4
Storage	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.1	305	0	$38	$256	$70	4.9
Classroom C57	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C60	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C61	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C62	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C63	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C64	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C65	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C66	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C67	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C68	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C69	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C70	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C71	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Classroom C73	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Occupancy Sensor	S	32	1,283	3	Relamp	No	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,283	0.1	191	0	$24	$219	$60	6.6
Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	131	0	$16	$110	$30	4.9

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Server Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Guidance Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,060	3	Relamp	No	6	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,060	0.1	154	0	$19	$110	$30	4.1
Private Offices (3 Total)	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	69	0	$9	$55	$15	4.6
Private Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Conference Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	69	0	$9	$55	$15	4.6
Classroom C50	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	18	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.2	416	0	$52	$329	$90	4.6
Child Study Rooms C49	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	116	0	$14	$91	$25	4.6
Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	92	0	$12	$73	$20	4.6
Locker Room Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,060	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,060	0.0	26	0	$3	$18	$5	4.1
Locker Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	8	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.1	185	0	$23	$146	$40	4.6
PE Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Restroom	1	Compact Fluorescent: Plug in Lamp	Wall Switch	S	26	1,860	3	Relamp	No	1	LED Screw-In Lamps: Plug in Lamp	Wall Switch	14	1,860	0.0	16	0	$2	$34	$0	17.4
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Locker Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	9	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.1	208	0	$26	$164	$45	4.6
PE Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Restroom	1	Compact Fluorescent: Plug in Lamp	Wall Switch	S	26	1,860	3	Relamp	No	1	LED Screw-In Lamps: Plug in Lamp	Wall Switch	14	1,860	0.0	16	0	$2	$34	$0	17.4
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Gym	21	Linear Fluorescent - T5HO: 4' T5HO (54W) - 4L	Occupancy Sensor	S	234	2,060	3	Relamp	No	21	LED - Linear Tubes: (4) 4' T5HO (25W) Lamps	Occupancy Sensor	102	2,060	1.4	4,054	-1	$508	$2,217	$0	4.4
Gym Hallways	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	2,060	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,060	0.0	51	0	$6	$37	$10	4.1
Gym Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Back of Foyer Hallway	6	Compact Fluorescent: Plug in Lamp	Wall Switch	S	23	2,060	3	Relamp	No	6	LED Screw-In Lamps: Plug in Lamp	Wall Switch	16	2,060	0.0	61	0	$8	$207	$0	26.9
Back of Foyer Hallway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.0	97	0	$12	$73	$20	4.4
Stairwells (2 Total)	8	Compact Fluorescent: Plug in Lamp	Wall Switch	S	26	2,060	3	Relamp	No	8	LED Screw-In Lamps: Plug in Lamp	Wall Switch	14	2,060	0.0	140	0	$18	$276	$0	15.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Hallway	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,060	3	Relamp	No	21	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,060	0.5	1,520	0	$190	$1,150	$315	4.4
Classroom D1	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D2	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D3	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D4	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D5	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D6	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D7	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D8	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D9	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D10	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D11	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D12	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Classroom D13	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	361	0	$45	$438	$120	7.0
Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	O	62	1,283	2	Delamp & Add Reflectors	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	41	0	$5	$91	$6	16.5
Restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	O	114	1,283	2	Delamp & Add Reflectors	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	387	0	$49	$228	$50	3.7
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Restroom	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	O	62	1,283	2	Delamp & Add Reflectors	No	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	82	0	$10	$181	$12	16.5
Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	O	114	1,283	2	Delamp & Add Reflectors	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	310	0	$39	$183	$40	3.7
Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.0	48	0	$6	$37	$10	4.4
Hallway	29	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	2,060	3	Relamp	No	29	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,060	0.7	2,100	-1	$263	$1,588	$435	4.4
Classroom D17	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	18	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.2	416	0	$52	$329	$90	4.6
Classroom D25	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	18	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.2	416	0	$52	$329	$90	4.6
Classroom D26	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	18	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.2	416	0	$52	$329	$90	4.6
Faculty Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6

	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
Faculty Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	23	0	$3	$18	$5	4.6
Lounge/Copy Room D22	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	6	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.1	139	0	$17	$110	$30	4.6
Prep Room D21	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	69	0	$9	$55	$15	4.6
Office Room D28A	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Office Room D28B	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	5	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	116	0	$14	$91	$25	4.6
Private Office (2 Total)	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Storage Room D61	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Storage Room D62	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	1,860	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	1,860	0.0	46	0	$6	$37	$10	4.6
Classroom D29	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D30	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	O	62	1,283	2	Delamp & Add Reflectors	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	41	0	$5	$91	$6	16.5
Restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	O	114	1,283	2	Delamp & Add Reflectors	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	387	0	$49	$228	$50	3.7
Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Occupancy Sensor	O	62	1,283	2	Delamp & Add Reflectors	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,283	0.0	41	0	$5	$91	$6	16.5
Restroom	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	O	114	1,283	2	Delamp & Add Reflectors	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	0.2	387	0	$49	$228	$50	3.7
Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Classroom D34	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D35	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D36	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D37	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D38	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D39	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D40	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D41	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D42	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D43	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0

	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
Classroom D44	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Classroom D45	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.3	541	0	$68	$657	$180	7.0
Stairwells (2 Total)	8	Compact Fluorescent: Plug in Lamp	Wall Switch	S	26	2,060	3	Relamp	No	8	LED Screw-In Lamps: Plug in Lamp	Wall Switch	14	2,060	0.0	140	0	$18	$276	$0	15.7
Walkway to Library	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	2,060	3	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,060	0.1	338	0	$42	$256	$70	4.4
Electric Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,860	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,860	0.0	87	0	$11	$73	$20	4.9
Library	65	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	1,283	3	Relamp	No	65	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,283	1.1	1,955	-1	$245	$2,373	$650	7.0
Library	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,283	3	Relamp	No	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,283	0.4	767	0	$96	$931	$255	7.0
Transition Spaces	20	Exit Signs: LED - 2 W Lamp	None	S	6	8,760		None	No	20	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Exterior	17	High-Pressure Sodium: (1) 70W Lamp	Timeclock	S	95	4,380	1	Fixture Replacement	No	17	LED - Fixtures: Other	Timeclock	29	4,380	0.6	4,914	0	$629	$3,378	$85	5.2
Exterior	6	Compact Fluorescent: Screw in Lamp	Timeclock	S	26	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Other	Timeclock	18	4,380	0.0	210	0	$27	$1,192	$30	43.2
Courtyard	6	Metal Halide: (1) 50W Lamp	Timeclock	S	72	4,380	1	Fixture Replacement	No	6	LED - Fixtures: Other	Timeclock	22	4,380	0.2	1,314	0	$168	$1,192	$30	6.9
Courtyard	1	High-Pressure Sodium: (1) 150W Lamp	Timeclock	S	188	4,380	1	Fixture Replacement	No	1	LED - Fixtures: Other	Timeclock	56	4,380	0.1	578	0	$74	$199	$5	2.6
Outside Vestibules	4	Compact Fluorescent: Screw in Lamp	Timeclock	S	23	4,380	1	Fixture Replacement	No	4	LED - Fixtures: Other	Timeclock	16	4,380	0.0	123	0	$16	$795	$20	49.4
Exterior	4	LED - Fixtures: Architectural Flood/Spot Luminaire	Timeclock	S	11	4,380		None	No	4	LED - Fixtures: Architectural Flood/Spot Luminaire	Timeclock	11	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior	4	Halogen Incandescent: Screw in Lamp	Timeclock	S	150	4,380	3	Relamp	No	4	LED Screw-In Lamps: Screw in Lamp	Timeclock	23	4,380	0.3	2,225	0	$285	$69	$4	0.2
Exterior	1	High-Pressure Sodium: (1) 150W Lamp	Timeclock	S	188	4,380	1	Fixture Replacement	No	1	LED - Fixtures: Other	Timeclock	56	4,380	0.1	578	0	$74	$199	$5	2.6
Under Canopy	2	Metal Halide: (1) 100W Lamp	Timeclock	S	128	8,760	1	Fixture Replacement	No	2	LED - Fixtures: Other	Timeclock	38	8,760	0.1	1,577	0	$202	$397	$10	1.9
Under Canopy	4	Metal Halide: (1) 100W Lamp	Timeclock	S	128	4,380	1	Fixture Replacement	No	4	LED - Fixtures: Other	Timeclock	38	4,380	0.2	1,577	0	$202	$795	$20	3.8
Exterior	8	Metal Halide: (1) 400W Lamp	Timeclock	S	458	4,380	1	Fixture Replacement	No	8	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Timeclock	135	4,380	1.3	11,318	0	$1,449	$7,445	$800	4.6

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
Boiler Room #1	Hydronic Heating	2	Heating Hot Water Pump	25.0	91.7%	No	W	3,050	4, 6	Yes	93.6%	Yes	2	5.2	48,227	0	$6,174	$21,690	$0	3.5
Boiler Room #1	Hydronic Heating	2	Heating Hot Water Pump	7.5	93.6%	No	N	3,391	4, 6	Yes	93.6%	Yes	2	1.4	15,202	0	$1,946	$9,476	$0	4.9
Boiler Room #1	Boiler Burners	2	Boiler Feed Water Pump	5.0	81.0%	No	B	2,745	4	Yes	86.5%	No		0.3	1,206	0	$154	$1,422	$0	9.2
Boiler Room #2	Hydronic Heating	2	Heating Hot Water Pump	10.0	89.5%	No	W	3,391	4, 6	Yes	91.7%	Yes	2	2.1	22,114	0	$2,831	$10,303	$0	3.6
Elevator	Elevator	1	Other	15.0	72.0%	No	W	183		No	72.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Classrooms	1	Supply Fan	5.0	87.5%	No	W	2,745	4, 5	Yes	89.5%	Yes	1	1.5	4,565	0	$584	$4,076	$400	6.3
Roof	Classrooms	1	Supply Fan	5.0	87.5%	No	W	2,745	4, 5	Yes	89.5%	Yes	1	1.5	4,565	0	$584	$4,076	$400	6.3
Roof	Classrooms	1	Supply Fan	3.0	87.5%	No	W	2,745	4, 5	Yes	89.5%	Yes	1	0.9	2,739	0	$351	$3,884	$240	10.4
Various	Newer Unit Ventilators	15	Supply Fan	0.3	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Various	Original Unit Ventilators	30	Supply Fan	0.2	74.0%	No	B	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room #1	Domestic Hot Water	1	Water Supply Pump	0.2	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room #1	Hydronic Heating	1	Boiler Feed Water Pump	0.5	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room #2	Domestic Hot Water	2	Water Supply Pump	0.2	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Various	Exhaust	2	Exhaust Fan	0.3	74.0%	No	W	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Classrooms	HV Units	2	Supply Fan	0.3	74.0%	No	B	2,745		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Blue Room	HV Units	2	Supply Fan	5.0	87.5%	No	W	2,745	4, 5	Yes	89.5%	Yes	2	3.0	9,129	0	$1,169	$8,152	$800	6.3
Blue Room	HV Units	2	Exhaust Fan	1.0	82.5%	No	B	2,745		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Gym	HV Units	2	Supply Fan	3.0	87.5%	No	W	2,745	4, 5	Yes	89.5%	Yes	2	1.8	5,477	0	$701	$7,768	$480	10.4
Gym	HV Units	4	Exhaust Fan	1.0	82.5%	No	B	2,745		No	82.5%	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
Roof	Classrooms	1	Packaged AC	15		W	NR	Yes	1	Packaged AC	15		11.50		1.4	2,173	0	$278	$20,908	$1,185	70.9
Roof	Classrooms	1	Packaged AC	15		W	NR	Yes	1	Packaged AC	15		11.50		1.4	2,173	0	$278	$20,908	$1,185	70.9
Roof	Classrooms	1	Packaged AC	8		W	NR	Yes	1	Packaged AC	8		11.50		0.7	1,086	0	$139	$13,366	$548	92.2
Roof	Blue Room	1	Packaged AC	30		W	NR	Yes	1	Packaged AC	30		18.00		11.2	17,886	0	$2,290	$66,479	$0	29.0
Roof	Café/Gym	1	Packaged AC	60		W	NR	Yes	1	Packaged AC	60		18.00		22.4	35,773	0	$4,580	$132,958	$0	29.0
Roof	B Wing	1	Split-System AC	3		W	NR	Yes	1	Split-System AC	3		14.00		0.6	975	0	$125	$4,489	$276	33.8
Roof	C Wing	2	Split-System AC	3		W	NR	Yes	2	Split-System AC	3		14.00		1.2	1,949	0	$250	$8,977	$552	33.8
Main Office	Main Office	2	Window AC	2		W	NR	Yes	2	Window AC	2		12.00		0.5	842	0	$108	$4,355	$0	40.4
Offices	Offices	3	Window AC	2		W	NR	Yes	3	Window AC	2		12.00		0.8	1,263	0	$162	$6,533	$0	40.4
Classrooms	Classrooms	3	Window AC	2		B	NR	Yes	3	Window AC	2		12.00		1.5	2,401	0	$307	$6,533	$0	21.3
Offices	Offices	2	Window AC	1		B	NR	Yes	2	Window AC	1		12.00		0.4	667	0	$85	$2,722	$0	31.9
Classrooms	Classrooms	2	Window AC	2		B	NR	Yes	2	Window AC	2		12.00		1.0	1,600	0	$205	$4,355	$0	21.3
Classrooms	Classrooms	3	Window AC	2		B	NR	Yes	3	Window AC	2		12.00		1.5	1,200	0	$154	$6,533	$0	42.5

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 #1	Hydronic Heating	1	Non-Condensing Hot Water Boiler	5,022	W	NR	Yes	1	Condensing Hot Water Boiler	5,022.00	93.00%	Ec	0.0	0	729	$6,190	$92,069	$0	14.9
Boiler Room #1	Hydronic Heating	1	Non-Condensing Hot Water Boiler	5,022	W	NR	Yes	1	Condensing Hot Water Boiler	5,022.00	93.00%	Ec	0.0	0	243	$2,063	$92,069	$0	44.6
Boiler Room #2	"D" Wing	1	Condensing Hot Water Boiler	1,700	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler Room #2	"D" Wing	1	Condensing Hot Water Boiler	1,700	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler Room #3	"E" Wing	1	Non-Condensing Hot Water Boiler	215	W	NR	Yes	1	Non-Condensing Hot Water Boiler	215.00	85.00%	AFUE	0.0	0	15	$124	$7,865	$400	60.3
Roof	Classrooms	1	Furnace	237	W	NR	Yes	1	Furnace	237.00	95.00%	AFUE	0.0	0	14	$120	$5,370	$400	41.4
Roof	Classrooms	1	Furnace	316	W	NR	Yes	1	Furnace	316.00	95.00%	AFUE	0.0	0	19	$160	$7,160	$400	42.2
Roof	Classrooms	1	Furnace	108	W	NR	Yes	1	Furnace	108.00	95.00%	AFUE	0.0	0	6	$51	$2,447	$400	40.4

DHW Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Domestic Hot Water	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
Boiler Room	Domestic Hot Water	1	Storage Tank Water Heater (> 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0
2nd Floor Mechanical	Domestic Hot Water	1	Storage Tank Water Heater (≤ 50 Gal)	W		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	7	5	Faucet Aerator (Lavatory)	2.00	0.50	0.0	0	13	$107	$36	$0	0.3
Restrooms	7	4	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	11	$97	$29	$0	0.3
Restrooms	7	8	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	23	$193	$57	$0	0.3

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	Cooler (35F to 55F)	8, 9	Yes	No	Yes	0.2	3,170	0	$406	$1,977	$115	4.6
Outside Kitchen	1	Low Temp Freezer (-35F to -5F)		No	No	No	0.0	0	0	$0	$0	$0	0.0

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (≤15 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	3	Refrigerator Chest	No		No	0.0	0	0	$0	$0	$0	0.0
Lounge	2	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Refrigerator Chest	No		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

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

Cooking Equipment Inventory & Recommendations

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

Dishwasher Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Water Heater Fuel Type	Booster Heater Fuel Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Payback w/ Incentives in Years
Kitchen	1	Single Tank Conveyor (High Temp)	Natural Gas	N/A	No		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Middle School	99	Desktop Computer	120.0	
Middle School	1	Laptop Cart	2,160.0	
Middle School	61	Fan	100.0	
Middle School	56	TV	150.0	
Middle School	71	Smart Board / Projector	300.0	
Middle School	10	Small Office Printers	50.0	
Middle School	4	Large Xerox- Type Printers	515.0	
Middle School	4	Coffee Maker	400.0	
Middle School	16	Microwave	1,100.0	
Middle School	86	Small Speakers	90.0	
Middle School	2	Residential Refrigerator	690.0	
Middle School	11	Mini Fridge	260.0	
Middle School	3	Water Dispenser	300.0	
Middle School	1	Wheelchair Elevator	600.0	
Middle School	4	Large Floor Fans	185.0	
Middle School	1	Kiln	10,555.0	
Middle School	4	Speakers	100.0	
Gym	4	Large Speakers	500.0	
Middle School	1	Misc. Sound Equipment	3,500.0	
Middle School	1	Misc. IT Equipment	4,500.0	
Middle School	1	Misc Shop Equipment	5,500.0	
Kitchen	2	Commercial Mixer	746.0	No

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
Lounge	1	Refrigerated	10	Yes	0.2	1,612	0	$206	$230	$50	0.9
Hallway	1	Non-Refrigerated	N/A	No	0.0	0	0	$0	$0	$0	0.0
Hallway	1	Refrigerated	10	Yes	0.2	1,612	0	$206	$230	$50	0.9
2nd Floor Hallway	1	Refrigerated	10	Yes	0.2	1,612	0	$206	$230	$50	0.9

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

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ENERGY STAR® Score[1]

Sayreville Middle School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 170,847
Built: 1968

For Year Ending: February 28, 2018
Date Generated: October 02, 2018

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Sayreville Middle School 800 Washington Road Parlin, New Jersey 08859	Sayreville Board of Education 3198 Washington Rd Sayreville, NJ 08871 (___)___-_____	Erin Hill 3198 Washington Rd Sayreville, NJ 08871 732-525-5204 Erin.Hill@sayrevillek12.net

Property ID: 6563197

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
49.6 kBtu/ft²

Source EUI
81 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	2,818,186 (33%)
Natural Gas (kBtu)	5,662,356 (67%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	61.6
National Median Source EUI (kBtu/ft²)	100.6
% Diff from National Median Source EUI	-20%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	586

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-_____
_____

Professional Engineer Stamp
(if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate financial savings. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
BTU	A British thermal unit is the amount of heat required to increase the temperature of one pound water by one-degree Fahrenheit. Commonly used to measure natural gas consumption.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing energy management systems.
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
HVAC	Heating, ventilation, and air conditioning.
kW	Kilowatt. Equal to 1,000 Watts.
Load	The total amount of power used by a building system at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MMBtu	One million British thermal units.
psig	Pounds per square inch.
Plug Load	Refers to the amount of energy used in a space by products that are powered by means of an ordinary AC plug.
Simple Payback	The amount of time needed to recoup the funds expended in an investment, or to reach the break-even point.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
Turnkey	Provision of a complete product or service that is ready for immediate use
Watt (W)	Unit of power commonly used to measure electricity use.