Local Government Energy Audit Report

Parsippany High School

February 18, 2022

Prepared for:

Parsippany-Troy Hills Board of Education
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Parsippany, NJ 07054

Prepared by:

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Disclaimer

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

TRC reviewed the energy conservation measures and estimates of energy savings 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 material and labor costs primarily on RS Means cost manuals as well as on our experience at similar facilities. This approach is based on standard cost estimating manuals and is vendor neutral. Cost estimates include material and labor pricing associated with one for one equipment replacements. Cost estimates do not include demolition or removal of hazardous waste. The actual implementation costs for energy savings projects are anticipated to be significantly higher based on the specific conditions at your site(s). We strongly recommend that you work with your design engineer or contractor to develop actual project costs for your specific scope of work for the installation of high efficiency equipment. We encourage you to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on selected products and installers. TRC and NJBPU do not guarantee cost estimates and shall in no event be held liable should actual installed costs vary from these material and labor estimates.

Incentive values provided in this report are estimated based of previously run state efficiency programs. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available utility program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

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

Table of Contents

ENERGY EFFICIENCY INCENTIVE & REBATE TRANSITION

For the purposes of your LGEA, estimated incentives and rebates are included as placeholders for planning purposes. New Jersey utilities are rolling out their own energy efficiency programs, which your project may be eligible for depending on individual measures, quantities, and size of the building.

In 2018, Governor Murphy signed into law the landmark legislation known as the Clean Energy Act. The law called for a significant overhaul of New Jersey's clean energy systems by building sustainable infrastructure in order to fight climate change and reduce carbon emissions, which will in turn create well-paying local jobs, grow the state's economy, and improve public health while ensuring a cleaner environment for current and future residents.

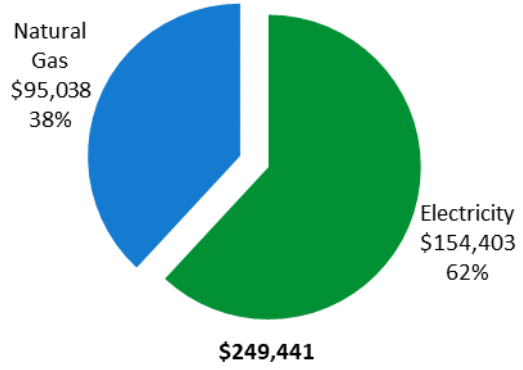
These "next generation" energy efficiency programs feature new ways of managing and delivering programs historically administered by New Jersey's Clean Energy Program™ (NJCEP). All of the investor-owned gas and electric utility companies will now also offer complementary energy efficiency programs and incentives directly to customers like you. NJCEP will still offer programs for new construction, renewable energy, the Energy Savings Improvement Program (ESIP), and large energy users.

New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website.

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Parsippany High 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 conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $249,441 Electricity: 1,420,406 kWh Natural Gas: 89,284 Therms	
ENERGY STAR® Benchmarking Score	52 *(1-100 scale)*	Congratulations, your building performs slightly 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.

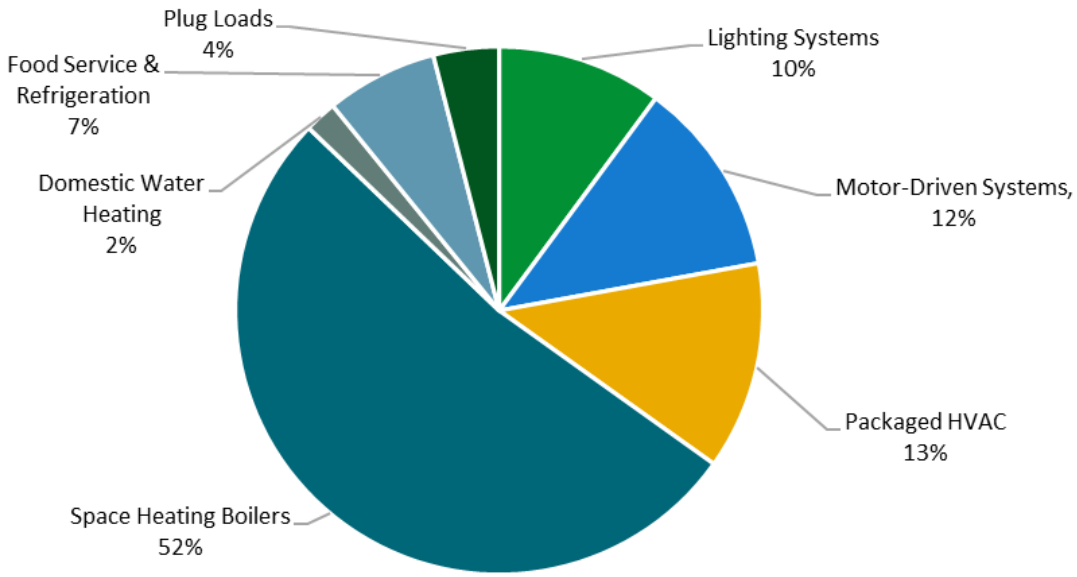


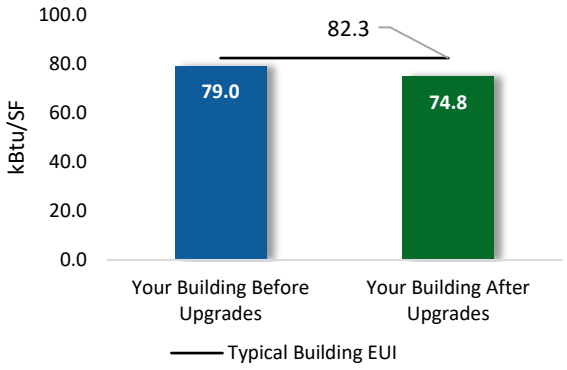
Figure 1 - Energy Use by System

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.

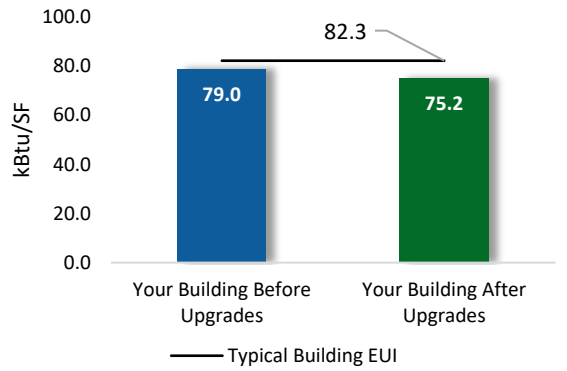
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$229,866
Potential Rebates & Incentives[1]	$40,962
Annual Cost Savings	$22,484
Annual Energy Savings	Electricity: 203,217 kWh Natural Gas: 369 Therms
Greenhouse Gas Emission Savings	104 Tons
Simple Payback	8.4 Years
Site Energy Savings (all utilities)	5%



Scenario 2: Cost Effective Package[2]

Installation Cost	$110,943
Potential Rebates & Incentives	$29,668
Annual Cost Savings	$20,527
Annual Energy Savings	Electricity: 185,958 kWh Natural Gas: 293 Therms
Greenhouse Gas Emission Savings	95 Tons
Simple Payback	4.0 Years
Site Energy Savings (all utilities)	5%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on previously run state rebate programs. Contact your utility provider for current program incentives that may apply.

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**4,197**	**1.2**	**-1**	**$448**	**$2,632**	**$360**	**$2,272**	**5.1**	**4,134**
ECM 1	Install LED Fixtures	Yes	432	0.0	0	$47	$525	$100	$425	9.1	435
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	281	0.2	0	$30	$271	$36	$235	7.8	276
ECM 3	Retrofit Fixtures with LED Lamps	Yes	3,483	1.0	-1	$371	$1,835	$224	$1,611	4.3	3,422
Lighting Control Measures			**123,218**	**19.6**	**-26**	**$13,120**	**$66,656**	**$24,880**	**$41,776**	**3.2**	**121,063**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	101,425	16.2	-21	$10,800	$43,706	$5,385	$38,321	3.5	99,651
ECM 5	Install High/Low Lighting Controls	Yes	21,794	3.4	-5	$2,321	$22,950	$19,495	$3,455	1.5	21,413
Motor Upgrades			**421**	**0.1**	**0**	**$46**	**$1,824**	**$0**	**$1,824**	**39.8**	**424**
ECM 6	Premium Efficiency Motors	No	421	0.1	0	$46	$1,824	$0	$1,824	39.8	424
Variable Frequency Drive (VFD) Measures			**40,782**	**9.8**	**0**	**$4,433**	**$32,532**	**$3,200**	**$29,332**	**6.6**	**41,067**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	40,782	9.8	0	$4,433	$32,532	$3,200	$29,332	6.6	41,067
Unitary HVAC Measures			**16,838**	**16.8**	**8**	**$1,911**	**$117,099**	**$11,294**	**$105,805**	**55.4**	**17,847**
ECM 8	Install High Efficiency Air Conditioning Units	No	16,838	16.8	8	$1,911	$117,099	$11,294	$105,805	55.4	17,847
HVAC System Improvements			**0**	**0.0**	**18**	**$191**	**$157**	**$44**	**$113**	**0.6**	**2,096**
ECM 9	Install Pipe Insulation	Yes	0	0.0	18	$191	$157	$44	$113	0.6	2,096
Domestic Water Heating Upgrade			**0**	**0.0**	**38**	**$404**	**$838**	**$324**	**$514**	**1.3**	**4,448**
ECM 10	Install Low-Flow DHW Devices	Yes	0	0.0	38	$404	$838	$324	$514	1.3	4,448
Food Service & Refrigeration Measures			**17,760**	**1.8**	**0**	**$1,931**	**$8,128**	**$860**	**$7,268**	**3.8**	**17,884**
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,033	0.1	0	$112	$1,213	$160	$1,053	9.4	1,040
ECM 12	Refrigeration Controls	Yes	2,744	0.0	0	$298	$4,385	$250	$4,135	13.9	2,764
ECM 13	Vending Machine Control	Yes	13,983	1.6	0	$1,520	$2,530	$450	$2,080	1.4	14,080
TOTALS (COST EFFECTIVE MEASURES)			**185,958**	**32.4**	**29**	**$20,527**	**$110,943**	**$29,668**	**$81,275**	**4.0**	**190,693**
TOTALS (ALL MEASURES)			**203,217**	**49.3**	**37**	**$22,484**	**$229,866**	**$40,962**	**$188,905**	**8.4**	**208,964**

* - All incentives presented in this table are included as placeholders and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 2 – Evaluated Energy Improvements

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

1.1 Planning Your Project

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

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

Pick Your Installation Approach

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

For details on these programs please visit New Jersey's Clean Energy Program website or contact your utility provider.

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.

Successor Solar Incentive Program (SuSI)

New Jersey is committed to supporting solar energy. Solar projects help the state reach the renewable goals outlined in the state's Energy Master Plan. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available, but certified solar projects are able to earn one SREC II (Solar Renewable Energy Certificates II) for each megawatt-hour of solar electricity produced from a qualifying solar facility.

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

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

Ongoing Electric Savings with Demand Response

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

2 EXISTING CONDITIONS

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

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 July 6, 2021, TRC performed an energy audit at Parsippany High School located in Parsippany, New Jersey. TRC met with Tony Cordova to review the facility operations and help focus our investigation on specific energy-using systems.

The Parsippany High School is a one-story, 174,377 square foot building built in 1967. Spaces include classrooms, gymnasium, auditorium, offices, cafeteria, corridors, ballrooms, kitchen, storage, and mechanical space.

The entity was enrolled in a Pay for Performance program in 2018. The school has made several upgrades including a conversion to LED lighting.

2.2 Building Occupancy

The facility is occupied from September through June. Typical weekday occupancy is 151 staff and 931 students.

Summer occupancy includes a summer day camp and continuing maintenance activities.

Building Name	Weekday/Weekend	Operating Schedule
Parsippany High School	Weekday	6:30 AM - 6:00 PM
	Weekend	Varied

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a brick facade. The roof is flat and covered with gravel and is in fair condition.

Building Façade

Gravel Roof

Interior Structure

Building façade, gravel roof, interior structure

Most of the windows are double glazed and have aluminum frames with a thermal break. The glass-to-frame seals are in good condition. The operable window weather seals are in good condition, showing little evidence of excessive wear. Exterior doors have aluminum frames and are in good condition with undamaged door seals. Degraded window and door seals increase drafts and outside air infiltration.

Windows

Window Close Up

Exterior Door

2.4 Lighting Systems

The primary interior lighting system uses mainly 14.5-Watt linear LED T8 lamps. Most service spaces are illuminated with LED general purpose lamps. Additionally, there are several compact fluorescent lamps (CFL) and incandescent lamps. Gymnasium and auditorium fixtures have manually controlled high bay LED lamps. A few linear fluorescent fixtures were observed. All exit signs are LED.

Fixture types include 2-lamp, 3-lamp, or 4-lamp, 4-foot-long recessed troffer fixtures and surface mounted fixtures, and 2-foot fixtures with linear tube lamps. Most fixtures are in fair condition. Interior lighting levels were generally sufficient.

Most lighting fixtures are controlled manually and the remainder by occupancy sensors.

Library Lighting

Gymnasium High Bay

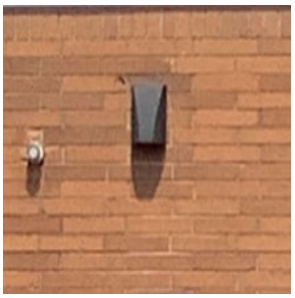
2-foot x 4-foot Recessed Troffer

Surface Mount Linear Lighting

Exterior fixtures include LED wall packs, canopy lights with LED lamps, and LED flood lamps. The pole mounted flood fixtures use LED sources. Exterior light fixtures are controlled by a time clock, switch, or photocell, depending on the fixture.

Flood Light

Cobra Head Pole Light



Wall Pack Fixtures

2.5 Air Handling Systems

Unit Ventilators

Unit ventilators are equipped with supply fan motors and electronically controlled outside air dampers and fan coil valves. This system is connected to the BMS and maintains a schedule for the unit ventilators. The units provide heat and ventilation, mainly to classrooms. They are served by the boilers.

Unit Ventilator

Unit Ventilator

Local Temperature Controls

Local Temperature Control

Packaged Units

The media center is served by three gas-fired packaged roof top units (RTUs) ranging in size from 104 MBh to 208 MBh output of heating and 7.5 tons to 25 tons of cooling. These units are equipped with economizers that appear in poor condition. TSS also has a gas-fired unit with cooling. The guidance offices and server rooms are conditioned by cooling-only packaged RTUs; the guidance office unit is 6.5 tons while the server room is cooled by a 12.5-ton unit. The gymnasium has four gas-fired, heating-only packaged RTUs.

Media Center RTU

TSS RTU

Gymnasium RTU

Media center RTU, TSS RTU, Gymnasium RTU

Unitary Electric HVAC Equipment

Classrooms use window air conditioning (AC) units. These vary in capacity between 0.5 tons and 2 tons of cooling. Most of the units are in good condition. They range in efficiency between 10.3 EER and 12.1 EER. Most are ENERGY STAR® labeled.

Window A/C Unit

Window A/C Unit

Window A/C Unit

Unitary Heating Equipment

The back wall of the library is equipped with four heated electric resistance heaters rated at 1500 Watts each. The units are in good condition. Equipment is controlled by a manual dial thermostat.

Electric Resistance Heater

Unit Label

Thermostat

Air Handling Units (AHUs)

Several AHUs condition different sections of the building. They are equipped with supply fan motors, hot water heating coils, and some also have a refrigerant coil for cooling. The auditorium has a large AHU connected to a 60-ton roof mounted condenser and the boiler distribution system. A few larger classrooms, including the wood shop and auto shop have AHUs that provide ventilation and heating. The server room AHU is connected to a 12.5-ton condenser on the roof for cooling only. These systems are controlled and monitored by the BMS.

Auditorium AHU

Server Room AHU

Woodshop AHU

2.6 Heating Hot Water Systems

Six Aerco 1,720 MBh output condensing hot water boilers serve the building heating load. The burners are fully modulating with a nominal efficiency of 86%. The boilers are configured in an automated control scheme. Multiple boilers are required under high load conditions. Installed in 2006, they are in fair condition.

The hydronic distribution system is a three-pipe, heating-only system.

The boilers are configured in a constant flow primary distribution with 14 VFD-controlled hot water pumps ranging from 3.0 hp to 15 hp, that operate in an automated control scheme. Pumps serve different areas of the building. The boilers provide hot water to fin tube radiators, unit ventilators, fan coil units, makeup air units, and AHUs throughout the building.

There are about 10 feet of 3-inch supply pipe with no insulation; insulation should be added.

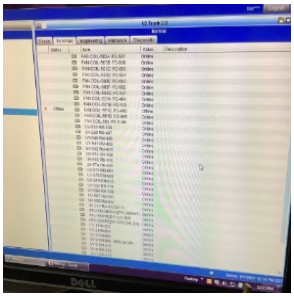
Boilers

Pumps

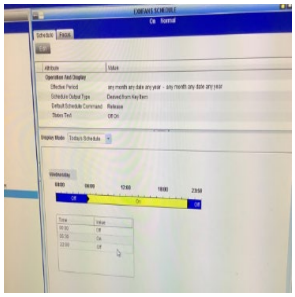
VFDs

2.7 Building Energy Management Systems (EMS)

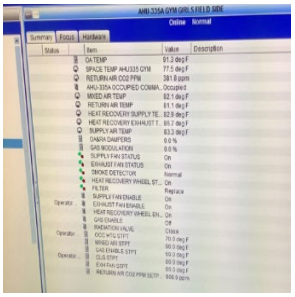
A Metasys EMS controls the HVAC equipment, boilers, air handlers, package units, exhaust fans, and unit ventilators. The EMS provides equipment scheduling and monitors and controls space temperatures, supply air temperatures, humidity, heating water loop temperatures and chilled water loop temperatures.



Unit Ventilator Trunk A



Exhaust Schedule



AHU Summary

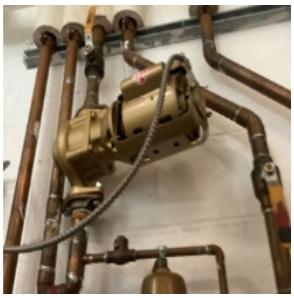
2.8 Domestic Hot Water

Hot water is produced by a two, 399 MBh gas-fired boilers with an 85% efficiency. Hot water is stored in two storage tanks.

One 1/6th hp circulation pump distributes water to end uses while two, ¼ hp pumps supply the storage tanks. The circulation pump operates continuously. The domestic hot water pipes are partially insulated, and the insulation is in good condition.

DHW Boilers

Storage Tanks



Pump

2.9 Food Service Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare meals for students and staff. Most cooking is done using a conventional gas-fired oven. Bulk prepared foods are held in several electric holding cabinets. Equipment is not high efficiency and is in good condition.

The dishwasher is a non-ENERGY STAR® high temperature, "door" type unit.

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

Double Rack Oven


Griddle


Stove Top/Oven

2.10 Refrigeration

The kitchen has several stand-up refrigerators with either solid or glass doors. There is also a stand-up solid door freezer. Most of the equipment is standard and in good condition.

The kitchen is also equipped with walk-in cooling equipment. The walk-in refrigerator has an estimated ½-ton compressor located on the roof and a two-fan evaporator. The walk-in medium temperature freezer has a ½-ton compressor located on the roof and two-fan evaporator.

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


Walk-in


Glass Door


Solid Door Refrigerators

2.11 Plug Load & Vending Machines

You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area as well as Energy Efficient Best Practices.

There are 134 computer workstations 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. Additional plug loads include shop tools, an art kiln, and cardio equipment.

There are several residential-style refrigerators throughout the building. These vary in condition and efficiency.

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

Dryer

Kilns

Vending Machines

Copier

2.12 Water-Using Systems

There are 14 restrooms with toilets and sinks. Faucet flow rates are at 1.5 gallons per minute (gpm) or higher.

Girls and boy's locker rooms are infrequently used. The showerheads are rated at 2.5 gpm.

Restroom sink

2.13 On-Site Generation

Parsippany High School has a 23.9 kW photovoltaic (PV) array with approximately 104 panels. This system provides approximately 1.3% of the electricity used at this facility.

Solar Array

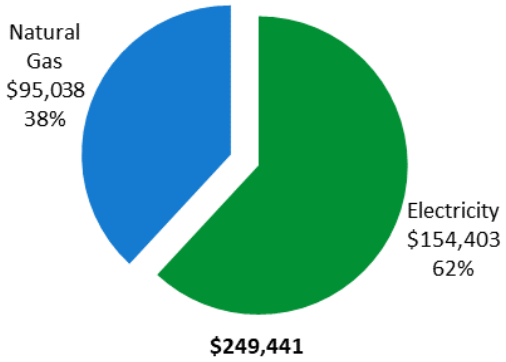
Disconnect

Solar Meter

3 Energy Use and Costs

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

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	1,420,406 kWh	$154,403
Natural Gas	89,284 Therms	$95,038
Total		**$249,441**



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.

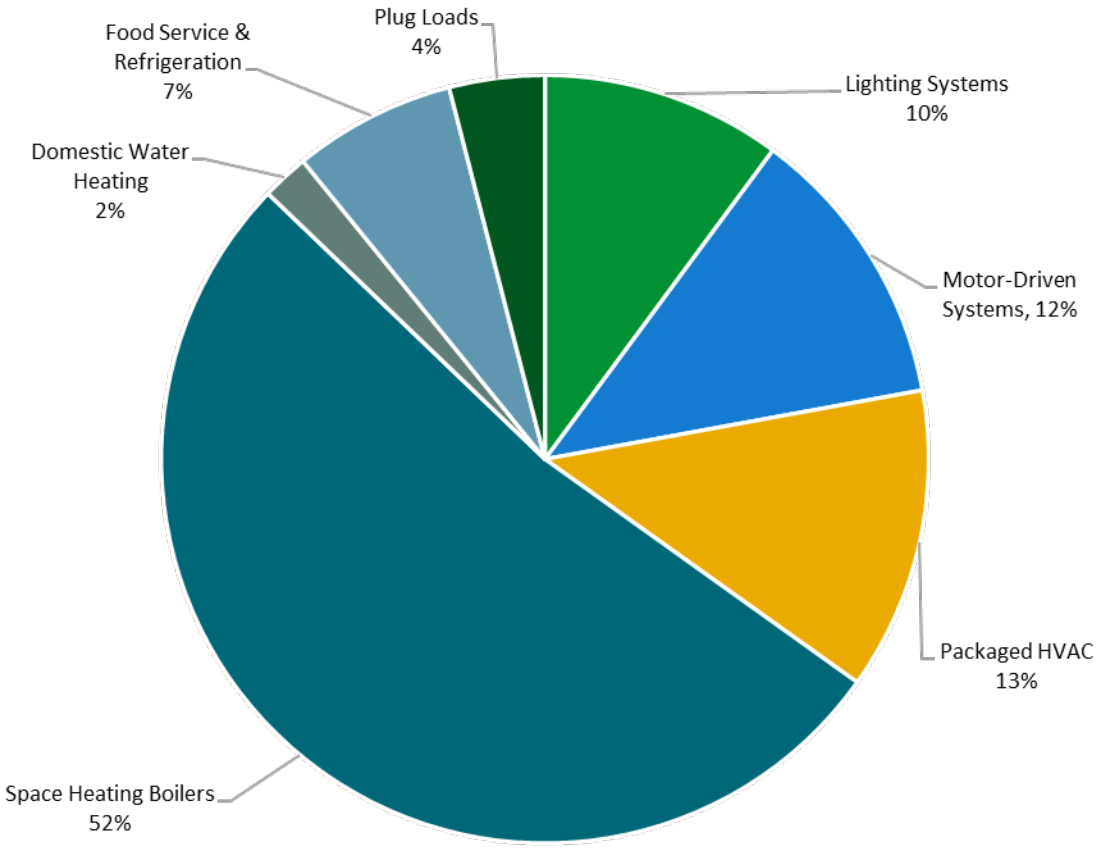
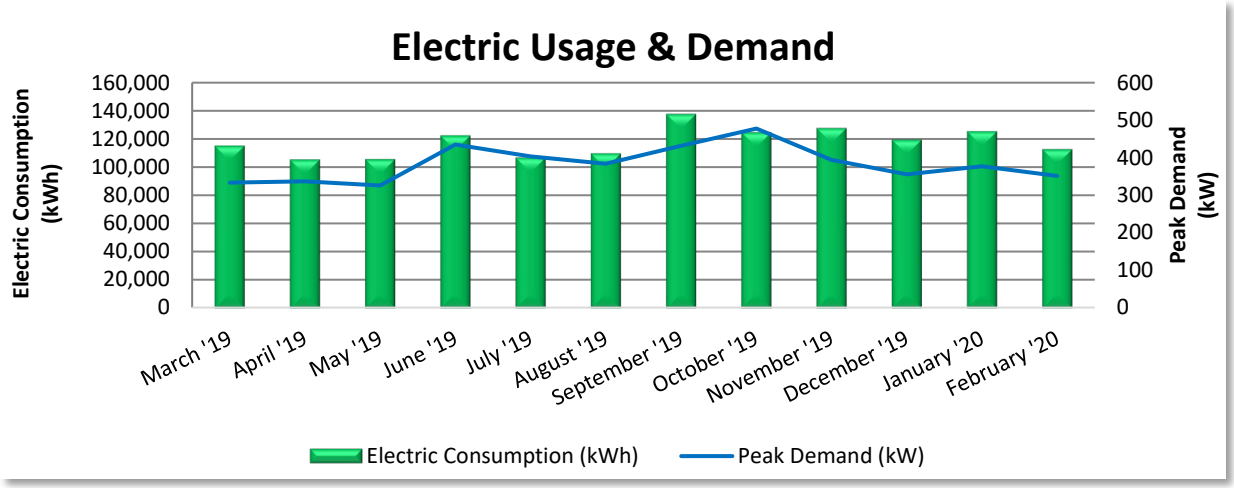


Figure 4 - Energy Balance

3.1 Electricity

JCP&L delivers electricity under rate class General Service Secondary, with electric production provided by Constellation, a third-party supplier.



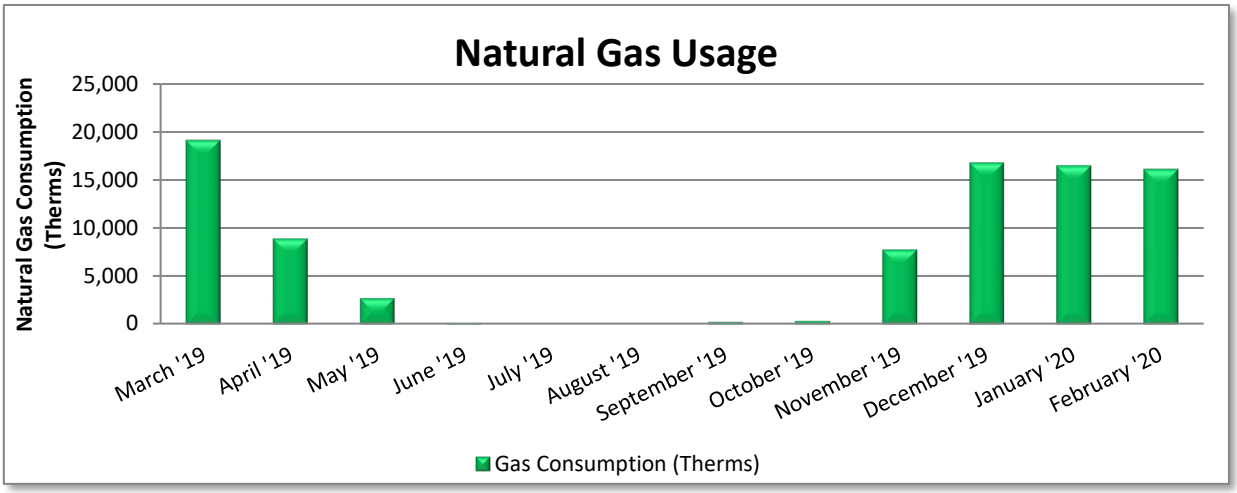
Electric Billing Data					
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**
3/20/19	29	115,447	334	$2,588	$13,294
4/17/19	28	105,696	337	$2,571	$12,278
5/17/19	30	105,905	326	$2,516	$11,831
6/19/19	33	122,714	435	$3,139	$13,327
7/18/19	29	107,094	404	$2,312	$12,151
8/16/19	29	109,998	384	$2,480	$12,444
9/18/19	33	138,088	432	$2,795	$14,511
10/18/19	30	125,083	478	$2,884	$13,328
11/18/19	31	128,055	394	$2,372	$14,035
12/19/19	31	119,743	356	$1,842	$12,497
1/20/20	32	125,630	377	$2,263	$12,885
2/18/20	29	113,061	351	$2,105	$11,400
Totals	**364**	**1,416,514**	**478**	**$29,867**	**$153,980**
Annual	**365**	**1,420,406**	**478**	**$29,949**	**$154,403**

Notes:

- Peak demand of 478 kW occurred in October 2019.
- Average demand over the past 12 months was 384 kW.
- The average electric cost over the past 12 months was $0.109/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.
- On-site generation is through a PPA and the site purchases the generated electricity from Sunlight. All of the electricity generated on-site is used on-site. Some of the electricity generated on-site is used on-site and the remainder is exported to the grid.

3.2 Natural Gas

NJ Natural Gas delivers and supplies natural gas under rate class Monthly 057M.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
3/21/19	33	19,128	$18,528
4/18/19	28	8,907	$9,156
5/21/19	33	2,741	$3,755
6/20/19	30	132	$1,574
7/23/19	33	0	$1,458
8/16/19	24	0	$1,166
9/17/19	32	279	$1,523
10/18/19	31	383	$1,777
11/15/19	28	7,798	$7,834
12/17/19	32	16,788	$16,462
1/15/20	29	16,490	$16,047
2/14/20	30	16,148	$15,236
Totals	**363**	**88,795**	**$94,517**
Annual	**365**	**89,284**	**$95,038**

Notes:

- The average gas cost for the past 12 months is $1.064/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

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

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

Benchmarking Score	**52**

Congratulations, your building performs slightly 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.

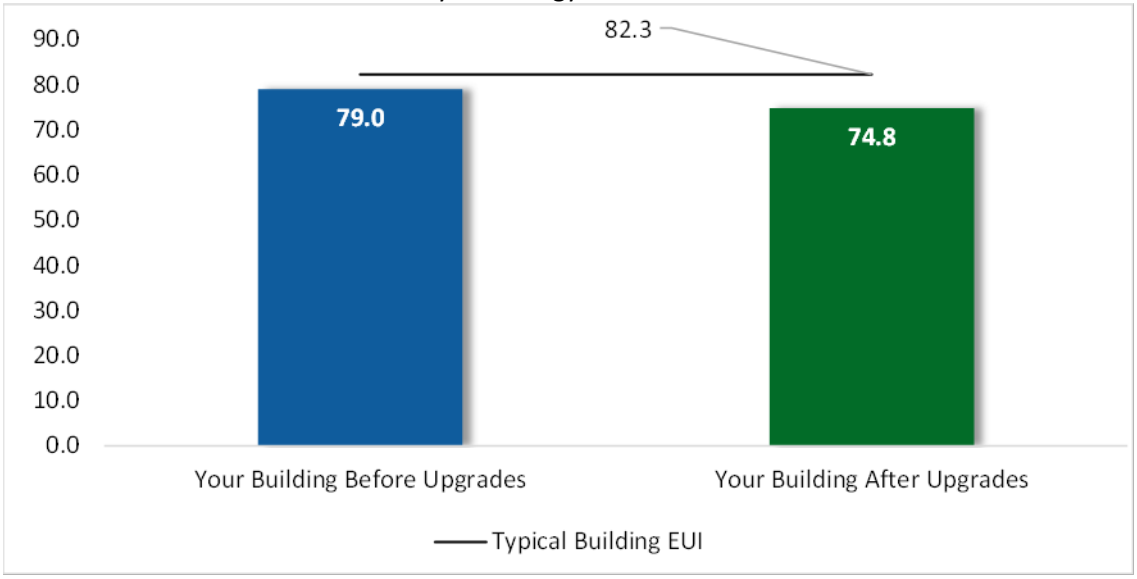


Figure 5 - Energy Use Intensity Comparison[3]

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

[3] Based on all evaluated ECMs

Tracking Your Energy Performance

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

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

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

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

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

4 Energy Conservation Measures

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

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

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

Financial incentives are based on previously run state rebate programs. New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website. Some measures and proposed upgrades may be eligible for higher incentives than those shown below.

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**4,197**	**1.2**	**-1**	**$448**	**$2,632**	**$360**	**$2,272**	**5.1**	**4,134**
ECM 1	Install LED Fixtures	Yes	432	0.0	0	$47	$525	$100	$425	9.1	435
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	281	0.2	0	$30	$271	$36	$235	7.8	276
ECM 3	Retrofit Fixtures with LED Lamps	Yes	3,483	1.0	-1	$371	$1,835	$224	$1,611	4.3	3,422
Lighting Control Measures			**123,218**	**19.6**	**-26**	**$13,120**	**$66,656**	**$24,880**	**$41,776**	**3.2**	**121,063**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	101,425	16.2	-21	$10,800	$43,706	$5,385	$38,321	3.5	99,651
ECM 5	Install High/Low Lighting Controls	Yes	21,794	3.4	-5	$2,321	$22,950	$19,495	$3,455	1.5	21,413
Motor Upgrades			**421**	**0.1**	**0**	**$46**	**$1,824**	**$0**	**$1,824**	**39.8**	**424**
ECM 6	Premium Efficiency Motors	No	421	0.1	0	$46	$1,824	$0	$1,824	39.8	424
Variable Frequency Drive (VFD) Measures			**40,782**	**9.8**	**0**	**$4,433**	**$32,532**	**$3,200**	**$29,332**	**6.6**	**41,067**
ECM 7	Install VFDs on Constant Volume (CV) Fans	Yes	40,782	9.8	0	$4,433	$32,532	$3,200	$29,332	6.6	41,067
Unitary HVAC Measures			**16,838**	**16.8**	**8**	**$1,911**	**$117,099**	**$11,294**	**$105,805**	**55.4**	**17,847**
ECM 8	Install High Efficiency Air Conditioning Units	No	16,838	16.8	8	$1,911	$117,099	$11,294	$105,805	55.4	17,847
HVAC System Improvements			**0**	**0.0**	**18**	**$191**	**$157**	**$44**	**$113**	**0.6**	**2,096**
ECM 9	Install Pipe Insulation	Yes	0	0.0	18	$191	$157	$44	$113	0.6	2,096
Domestic Water Heating Upgrade			**0**	**0.0**	**38**	**$404**	**$838**	**$324**	**$514**	**1.3**	**4,448**
ECM 10	Install Low-Flow DHW Devices	Yes	0	0.0	38	$404	$838	$324	$514	1.3	4,448
Food Service & Refrigeration Measures			**17,760**	**1.8**	**0**	**$1,931**	**$8,128**	**$860**	**$7,268**	**3.8**	**17,884**
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,033	0.1	0	$112	$1,213	$160	$1,053	9.4	1,040
ECM 12	Refrigeration Controls	Yes	2,744	0.0	0	$298	$4,385	$250	$4,135	13.9	2,764
ECM 13	Vending Machine Control	Yes	13,983	1.6	0	$1,520	$2,530	$450	$2,080	1.4	14,080
TOTALS			**203,217**	**49.3**	**37**	**$22,484**	**$229,866**	**$40,962**	**$188,905**	**8.4**	**208,964**

* - All incentives presented in this table are included as placeholders and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 6 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**4,197**	**1.2**	**-1**	**$448**	**$2,632**	**$360**	**$2,272**	**5.1**	**4,134**
ECM 1	Install LED Fixtures	432	0.0	0	$47	$525	$100	$425	9.1	435
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	281	0.2	0	$30	$271	$36	$235	7.8	276
ECM 3	Retrofit Fixtures with LED Lamps	3,483	1.0	-1	$371	$1,835	$224	$1,611	4.3	3,422
Lighting Control Measures		**123,218**	**19.6**	**-26**	**$13,120**	**$66,656**	**$24,880**	**$41,776**	**3.2**	**121,063**
ECM 4	Install Occupancy Sensor Lighting Controls	101,425	16.2	-21	$10,800	$43,706	$5,385	$38,321	3.5	99,651
ECM 5	Install High/Low Lighting Controls	21,794	3.4	-5	$2,321	$22,950	$19,495	$3,455	1.5	21,413
Variable Frequency Drive (VFD) Measures		**40,782**	**9.8**	**0**	**$4,433**	**$32,532**	**$3,200**	**$29,332**	**6.6**	**41,067**
ECM 7	Install VFDs on Constant Volume (CV) Fans	40,782	9.8	0	$4,433	$32,532	$3,200	$29,332	6.6	41,067
HVAC System Improvements		**0**	**0.0**	**18**	**$191**	**$157**	**$44**	**$113**	**0.6**	**2,096**
ECM 9	Install Pipe Insulation	0	0.0	18	$191	$157	$44	$113	0.6	2,096
Domestic Water Heating Upgrade		**0**	**0.0**	**38**	**$404**	**$838**	**$324**	**$514**	**1.3**	**4,448**
ECM 10	Install Low-Flow DHW Devices	0	0.0	38	$404	$838	$324	$514	1.3	4,448
Food Service & Refrigeration Measures		**17,760**	**1.8**	**0**	**$1,931**	**$8,128**	**$860**	**$7,268**	**3.8**	**17,884**
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	1,033	0.1	0	$112	$1,213	$160	$1,053	9.4	1,040
ECM 12	Refrigeration Controls	2,744	0.0	0	$298	$4,385	$250	$4,135	13.9	2,764
ECM 13	Vending Machine Control	13,983	1.6	0	$1,520	$2,530	$450	$2,080	1.4	14,080
TOTALS		**185,958**	**32.4**	**29**	**$20,527**	**$110,943**	**$29,668**	**$81,275**	**4.0**	**190,693**

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

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

Figure 7 – 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 ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**4,197**	**1.2**	**-1**	**$448**	**$2,632**	**$360**	**$2,272**	**5.1**	**4,134**
ECM 1	Install LED Fixtures	432	0.0	0	$47	$525	$100	$425	9.1	435
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	281	0.2	0	$30	$271	$36	$235	7.8	276
ECM 3	Retrofit Fixtures with LED Lamps	3,483	1.0	-1	$371	$1,835	$224	$1,611	4.3	3,422

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

ECM 1: Install LED Fixtures

Replace existing fixtures containing HID lamps with new LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

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

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

Affected building areas: exterior HID fixtures.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Retrofit fluorescent fixtures by removing the fluorescent tubes and ballasts and replacing them with LED tubes and LED drivers (if necessary), which are designed to be used in retrofitted fluorescent fixtures.

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: T12 lamps in good shed and girl's locker room.

ECM 3: Retrofit Fixtures with LED Lamps

Replace fluorescent, compact fluorescent lamp (CFL), or incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as 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: CFLs, incandescent lamps, T5H0 lamps in press box, main hallway, maintenance shed, food shed.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**123,218**	**19.6**	**-26**	**$13,120**	**$66,656**	**$24,880**	**$41,776**	**3.2**	**121,063**
ECM 4	Install Occupancy Sensor Lighting Controls	101,425	16.2	-21	$10,800	$43,706	$5,385	$38,321	3.5	99,651
ECM 5	Install High/Low Lighting Controls	21,794	3.4	-5	$2,321	$22,950	$19,495	$3,455	1.5	21,413

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

ECM 4: Install Occupancy Sensor Lighting Controls

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

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

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

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

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

ECM 5: Install High/Low Lighting Controls

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

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

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

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

Affected building areas: hallways.

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

4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades		**421**	**0.1**	**0**	**$46**	**$1,824**	**$0**	**$1,824**	**39.8**	**424**
ECM 6	Premium Efficiency Motors	421	0.1	0	$46	$1,824	$0	$1,824	39.8	424

ECM 6: Premium Efficiency Motors

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

Affected motors:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Storage 3 rm 514 storage	AHU	1	Supply Fan	1.0	
Exterior 1	Guidence offices	1	Supply Fan	1.0	RTU-62
Exterior 1	Girls locker room	1	Exhaust Fan	3.0	RTU-148

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

4.4 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**40,782**	**9.8**	**0**	**$4,433**	**$32,532**	**$3,200**	**$29,332**	**6.6**	**41,067**
ECM 7	Install VFDs on Constant Volume (CV) Fans	40,782	9.8	0	$4,433	$32,532	$3,200	$29,332	6.6	41,067

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

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

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

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

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

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

Affected air handlers: auditorium and media center.

4.5 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**16,838**	**16.8**	**8**	**$1,911**	**$117,099**	**$11,294**	**$105,805**	**55.4**	**17,847**
ECM 8	Install High Efficiency Air Conditioning Units	16,838	16.8	8	$1,911	$117,099	$11,294	$105,805	55.4	17,847

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units at this facility 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 packaged RTUs are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 8: Install High Efficiency Air Conditioning Units

We evaluated replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. Some of the replacement units will incorporate efficient gas furnaces. 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 and heating load and the estimated annual operating hours.

Affected units: package units and split systems serving media center, cafeteria, auditorium, and guidance office.

4.6 HVAC Improvements

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**0**	**0.0**	**18**	**$191**	**$157**	**$44**	**$113**	**0.6**	**2,096**
ECM 9	Install Pipe Insulation	0	0.0	18	$191	$157	$44	$113	0.6	2,096

ECM 9: Install Pipe Insulation

Install insulation on heating water and domestic hot water system piping. Distribution system losses are dependent on system fluid temperature, the size of the distribution system, and the level of insulation of the piping. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is exposed to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

Affected Systems: hot water piping and domestic hot water piping.

4.7 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**38**	**$404**	**$838**	**$324**	**$514**	**1.3**	**4,448**
ECM 10	Install Low-Flow DHW Devices	0	0.0	38	$404	$838	$324	$514	1.3	4,448

ECM 10: Install Low-Flow DHW Devices

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

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing. Pre-rinse spray valves (PRSVs) — often used in commercial and institutional kitchens — remove food waste from dishes prior to dishwashing.

Additional cost savings may result from reduced water usage.

4.8 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**17,760**	**1.8**	**0**	**$1,931**	**$8,128**	**$860**	**$7,268**	**3.8**	**17,884**
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	1,033	0.1	0	$112	$1,213	$160	$1,053	9.4	1,040
ECM 12	Refrigeration Controls	2,744	0.0	0	$298	$4,385	$250	$4,135	13.9	2,764
ECM 13	Vending Machine Control	13,983	1.6	0	$1,520	$2,530	$450	$2,080	1.4	14,080

ECM 11: Refrigerator/Freezer Case Electrically Commutated Motors

Replace shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in walk-in, coolers, and freezers. 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 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 12: Refrigeration Controls

Install additional controls to optimize the operation of walk-in coolers and freezers.

Many walk-in coolers and freezers have continuously operating electric heaters on the doors to prevent condensation formation. This measure adds a control system feature to shut off the door heaters when the humidity level is low enough that condensation will not occur if the heaters are off. This is done by measuring the ambient humidity and temperature of the store, comparing that to the dewpoint, and using pulse width modulation to control the anti-sweat door heaters.

Defrost controllers can be used to override defrost of evaporator fans when the defrost operation is not necessary, which reduces annual energy consumption. This measure is applicable to existing evaporator fans with a traditional electric defrost mechanism.

Many walk-in coolers and freezers have evaporator fans that run continuously. The measure adds a control system feature to automatically shut off evaporator fans when not needed.

Novelty coolers often run continuously. This measure adds a control system feature to automatically shut off novelty coolers based on pre-set store operating hours. Based on programmed hours, the control mechanism shuts off the cooler at the end of business and then begins operation on reduced cycles. Regular compressor operation begins the following day an hour before the start of business.

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 13: 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.

Operation and maintenance (O&M) plans enhance the operational efficiency of HVAC and other energy intensive systems and could save between 5% to 20% of the energy usage in your building without substantial capital investment. A successful plan includes your records of energy usage trends and costs, building equipment lists, current maintenance practices, planned capital upgrades, and incorporates your ideas for improved building operation. Your plan will address goals for energy-efficient operation, provide detail on how to reach the goals, and will outline procedures for measuring and reporting whether goals have been achieved.

You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

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

Lighting Maintenance

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

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

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.

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

Economizer Maintenance

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

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

Chiller Maintenance

Service chillers regularly to keep them operating properly. Chillers are responsible for a substantial portion of a commercial building's overall energy usage and when they do not work well, there is usually a noticeable increase in energy bills and increased occupant complaints. Regular diagnostics and service can save 5% to 10% of the cost of operating your chiller. If you already have a maintenance contract in place, your existing service company should be able to provide these services.

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

Ductwork Maintenance

Duct maintenance has two primary goals: keep the ducts clean to avoid air quality problems and seal leaks to save energy. Check for cleanliness, obstructions that block airflow, water damage, and leaks. Ducts should be inspected at least every two years.

The biggest symptoms of clogged air ducts are differing temperatures throughout the building and areas with limited airflow from supply registers. If a particular air duct is clogged, then air flow will only be cut off to some rooms in the building - not all of them. The reduced airflow will make it more difficult for those areas to reach the temperature setpoint which will cause the HVAC system to run longer to cool or heat that area properly. If you suspect clogged air ducts, ensure that all areas in front of supply registers are clear of items that may block or restrict air flow, and check for fire dampers or balancing dampers that have failed closed.

Duct leakage in commercial buildings can account for 5% to 25% of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building wasting conditioned air. Check ductwork for leakage. Eliminating duct leaks can improve ventilation system performance and reduce heating and cooling system operation.

Distribution system losses are dependent on-air system temperature, the size of the distribution system, and the level of insulation of the ductwork. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is missing or worn, the system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

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 and efficiently. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the boiler tubes to improve heat transfer.

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.

Label HVAC Equipment

For improved coordination in maintenance practices, we recommend labeling or re-labeling the site HVAC equipment. Maintain continuity in labeling by following labeling conventions as indicated in the facility drawings or EMS building equipment list. Use weatherproof or heatproof labeling or stickers for permanence, but do not cover over original equipment nameplates, which should be kept clean and readable whenever possible. Besides equipment, label piping for service and direction of flow when possible. Ideally, maintain a log of HVAC equipment, including nameplate information, asset tag designation, areas served, installation year, service dates, and other pertinent information.

This investment in your equipment will enhance collaboration and communication between your staff and your contracted service providers and may help you with regulatory compliance.

Optimize HVAC Equipment Schedules

Energy Management Systems (EMS) typically provide advanced controls for building HVAC systems, including chillers, boilers, air handling units, rooftop units and exhaust fans. The EMS monitors and reports operational status, schedules equipment 'start' and 'stop' times, locks out equipment operation based on outside air or space temperature, and often optimizes damper and valve operation based on complex algorithms. These EMS features, when in proper adjustment, can improve comfort for building occupants and save substantial energy.

Know your EMS scheduling capabilities. Regularly monitor HVAC equipment operating schedules and match them to building operating hours in order to eliminate unnecessary equipment operation and save energy. Monitoring should be performed often at sites with frequently changing usage patterns – daily in some cases. We recommend using the 'Optimal Start' feature of the EMS, if available, to optimize the building warmup sequence. Most EMS scheduling programs provide for "Holiday" schedules which can be used during reduced use or shutdown periods. Finally, many systems are equipped with a one-time override function which can be used to provide additional space conditioning due to a one-time, special event. When available this override feature should be used rather than changing the base operating schedule.

Water Heater Maintenance

The lower the supply water temperature that is used for hand washing sinks, the less energy is needed to heat the water. Reducing the temperature results in energy savings and the change is often unnoticeable to users. Be sure to review the domestic water temperature requirements for sterilizers and dishwashers as you investigate reducing the supply water temperature.

Also, 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.

Refrigeration Equipment Maintenance

Preventative maintenance keeps commercial refrigeration equipment running reliably and efficiently. Commercial refrigerators and freezers are mission-critical equipment that can cost a fortune when they go down. Even when they appear to be working properly, refrigeration units can be consuming too much energy. Have walk-in refrigeration and freezer and other commercial systems serviced at least annually. This practice will allow systems to perform to their highest capabilities and will help identify system issues if they exist.

Maintaining your commercial refrigeration equipment can save between 5% and 10% on energy costs. When condenser coils are dirty, your commercial refrigerators and freezers work harder to maintain the temperature inside. Worn gaskets, hinges, door handles or faulty seals cause cold air to leak from the unit, forcing the unit to run longer and use more electricity.

Regular cleaning and maintenance also help your commercial refrigeration equipment to last longer.

Water Conservation

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

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

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

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

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

Procurement Strategies

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

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

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

6 On-site Generation

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

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

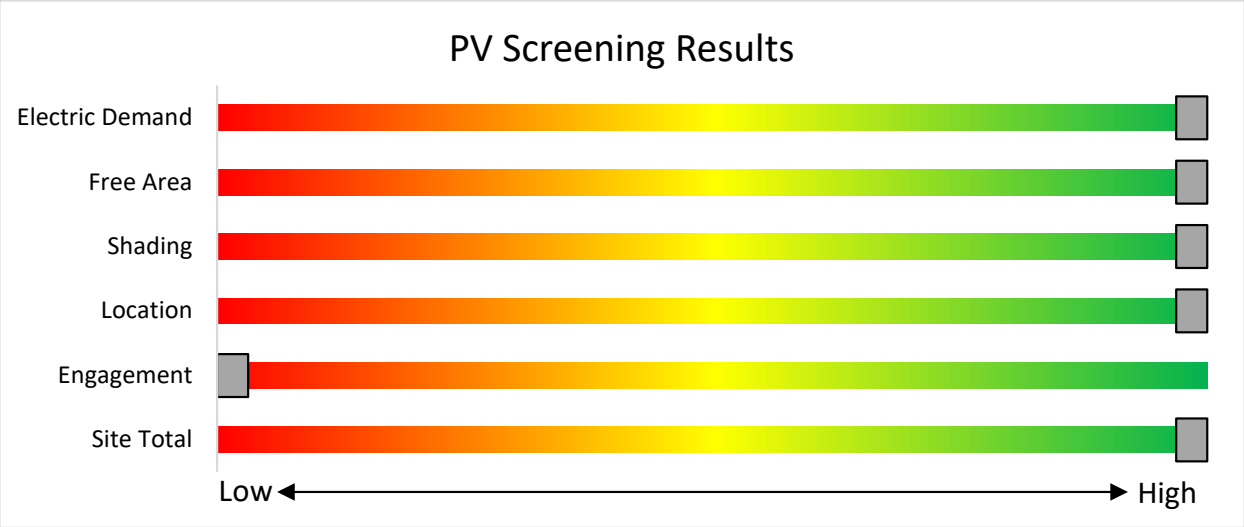
6.1 Solar Photovoltaic

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

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

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.



Potential	High	
System Potential	384	kW DC STC
Electric Generation	457,486	kWh/yr
Displaced Cost	$49,730	/yr
Installed Cost	$998,400	

Figure 8 - Photovoltaic Screening

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available for solar projects. Solar projects may qualify to earn SREC- IIs (Solar Renewable Energy Certificates-II), however, the project owners *must* register their solar projects prior to the start of construction to establish the project's eligibility.

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:

Successor Solar Incentive Program (SuSI): https://www.njcleanenergy.com/renewable-energy/programs/susi-program

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

6.2 Combined Heat and Power

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

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

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

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

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

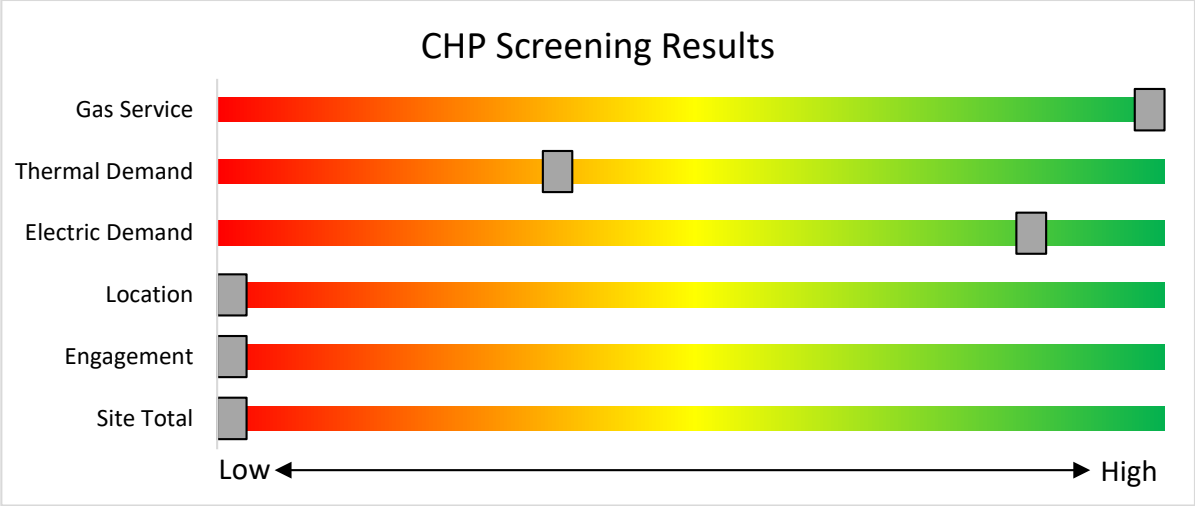


Figure 9 - Combined Heat and Power Screening

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

7.1 Utility Energy Efficiency Programs

New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website.

8 New Jersey's Clean Energy Programs

New Jersey's Clean Energy Program will continue to offer some energy efficiency programs.

8.1 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

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

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

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

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at www.njcleanenergy.com/CHP.

8.2 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter into 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 description 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.

8.3 Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The program is used to register and certify 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 SREC-IIs (Solar Renewable Energy Certificates-II). SuSI consists of two sub-programs. The Administratively Determined Incentive (ADI) Program and the Competitive Solar Incentive (CSI) Program.

Administratively Determined Incentive (ADI) Program

The ADI Program provides administratively set incentives for net metered residential projects, net metered non-residential projects 5 MW or less, and all community solar projects.

After the registration is accepted, construction is complete, and a complete final as-built packet has been submitted, the project is issued a New Jersey certification number, which enables it to generate New Jersey SREC- IIs.

Market Segments	Size MW dc	Incentive Value ($/SREC II)	Public Entities Incentive Value - $20 Adder ($/SRECII)
Net Metered Residential	All types and sizes	$90	N/A
Small Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects smaller than 1 MW	$100	$120
Large Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects 1 MW to 5 MW	$90	$110
Small Net Metered Non-Residential Ground Mount	Projects smaller than 1 MW	$85	$105
Large Net Metered Non-Residential Ground Mount	Projects 1 MW to 5 MW	$80	$100
LMI Community Solar	Up to 5 MW	$90	N/A
Non-LMI Community Solar	Up to 5 MW	$70	N/A
Interim Subsection (t)	All types and sizes	$100	N/A

Eligible projects may generate SREC-IIs for 15 years following the commencement of commercial operations which is defined as permission to operate (PTO) from the Electric Distribution Company. After 15 years, projects may be eligible for a NJ Class I REC.

SREC-IIs will be purchased monthly by the SREC-II Program Administrator who will allocate the SREC-IIs to the Load Serving Entities (BGS Providers and Third-Party Suppliers) annually based on their market share of retail electricity sold during the relevant Energy Year.

The ADI Program online portal is now open to new registrations effective August 28, 2021.

Competitive Solar Incentive Program

The Competitive Solar Incentive (CSI) Program will provide competitively set incentives for grid supply projects and net metered non-residential projects greater than 5MW. The program is currently under development with the goal of holding the first solicitation by early-to-mid 2022. For updates, please continue to check the Solar Proceedings page on the New Jersey's Clean Energy Program website.

Solar projects help the State of New Jersey reach renewable energy goals outlined in the state's Energy Master Plan.

If you are considering installing solar photovoltaics on your building, visit the following link for more information: https://njcleanenergy.com/renewable-energy/programs/susi-program.

9 PROJECT DEVELOPMENT

Energy conservation measures (ECMs) have been identified for your site and their energy and economic analyses are provided within this LGEA report. The next steps with project development are to set goals and create a comprehensive project plan. The graphic below provides an overview of the process flow for a typical energy efficiency or renewable energy project. We recommend implementing as many ECMs as possible prior to undertaking a feasibility study for a renewable project. The cyclical nature of this process flow demonstrates the ongoing work required to continually improve building energy efficiency over time. If your building(s) scope of work is relatively simple to implement or small in scope, the measurement and verification (M&V) step may not be required. It should be noted through a typical project cycle, there will be changes in costs based on specific scopes of work, contractor selections, design considerations, construction, etc. The estimated costs provided throughout this LGEA report demonstrate the unburdened turn-key material and labor cost only. There will be contingencies and additional costs at the time of implementation. We recommend comprehensive project planning includes the review of multiple bids for project work, incorporate potential operational & maintenance (O&M) cost savings and maximize your incentive potential.

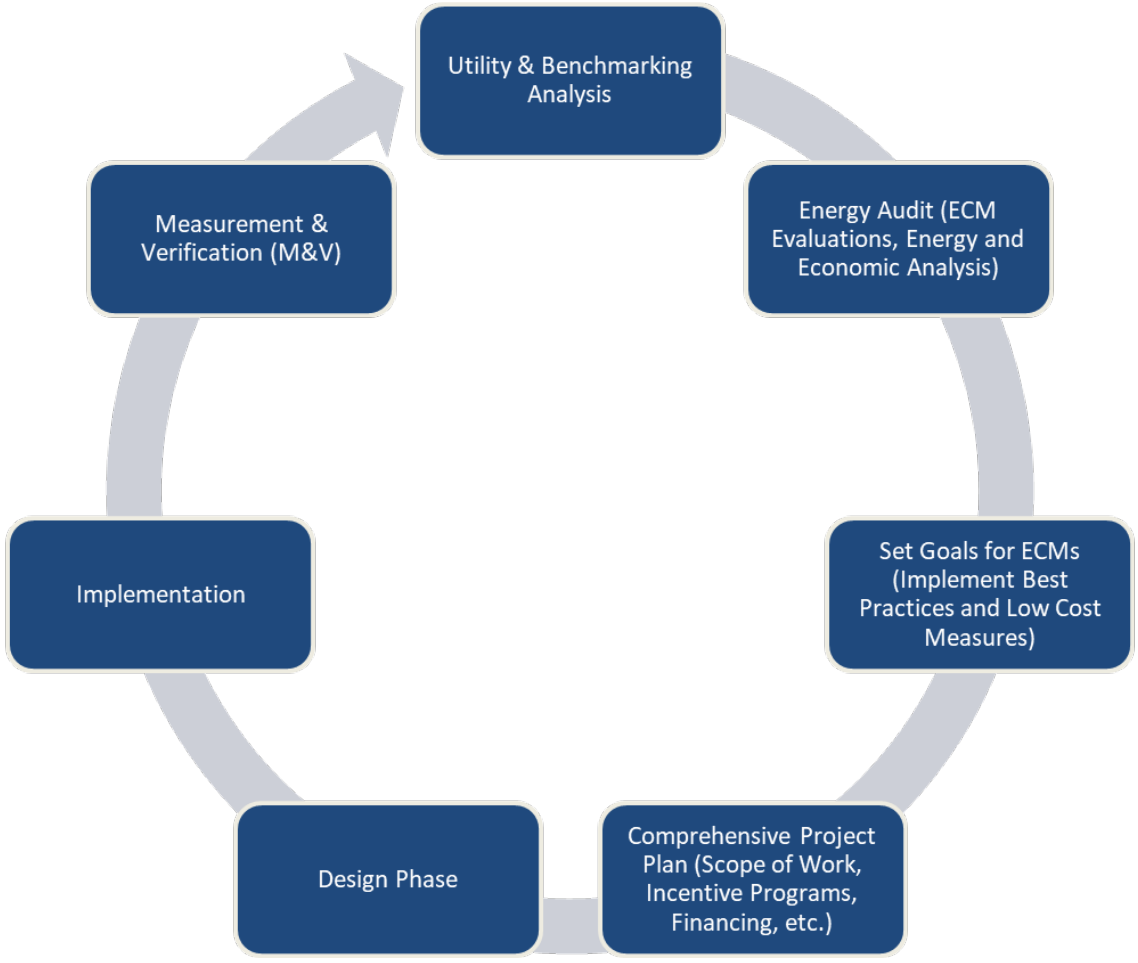


Figure 30 – Project Development Cycle

10 Energy Purchasing and Procurement Strategies

10.1 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].

10.2 Retail Natural Gas Supply Options

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

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

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

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

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

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

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 201	19	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	19	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,514	0	$161	$540	$70	2.9
Classroom 202 old computer room	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 203 old computer rm	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 204	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	478	0	$51	$270	$35	4.6
Classroom 205	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 205	15	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,196	0	$127	$270	$35	1.8
Classroom 206	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,275	0	$136	$540	$70	3.5
Classroom 207	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 208	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 301	11	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	877	0	$93	$270	$35	2.5
Classroom 302	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 303	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	4,030	0.0	0	0	$0	$0	$0	0.0
Classroom 303	24	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.2	1,435	0	$153	$540	$70	3.1
Classroom 304	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 305	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.0	279	0	$30	$270	$35	7.9
Classroom 305	22	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.2	1,315	0	$140	$540	$70	3.4
Classroom 305 A	3	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	179	0	$19	$270	$35	12.3
Classroom 306	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 307	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.0	120	0	$13	$0	$0	0.0
Classroom 307	14	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,116	0	$119	$270	$35	2.0
Classroom 308	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 309	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 309	28	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.2	1,116	0	$119	$540	$70	4.0
Classroom 310A	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 310A	14	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,116	0	$119	$270	$35	2.0

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 310B	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 310B	2	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030	4	None	Yes	2	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	2,781	0.0	27	0	$3	$0	$0	0.0
Classroom 310B	14	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,116	0	$119	$270	$35	2.0
Classroom 311 A-B	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 311 A-B	25	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	25	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.3	1,993	0	$212	$540	$70	2.2
Classroom 312 woodshop	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,030		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,030	0.0	0	0	$0	$0	$0	0.0
Classroom 312 woodshop	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030		None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,030	0.0	0	0	$0	$0	$0	0.0
Classroom 312 woodshop	44	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030		None	No	44	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,030	0.0	0	0	$0	$0	$0	0.0
Classroom 312 woodshop	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030		None	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,030	0.0	0	0	$0	$0	$0	0.0
Classroom 312 woodshop	1	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	S	72	4,030		None	No	1	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	4,030	0.0	0	0	$0	$0	$0	0.0
Classroom 401	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 403	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 404	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 404 office	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030	4	None	Yes	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	2,781	0.0	14	0	$1	$0	$0	0.0
Classroom 404 office	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,275	0	$136	$540	$70	3.5
Classroom 405	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 406	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 407	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 408	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 409	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 410	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 410	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 501	27	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	S	58	2,781		None	No	27	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 502	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,275	0	$136	$540	$70	3.5
Classroom 503	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	S	58	2,781		None	No	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
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Classroom 504	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 505	28	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	S	58	2,781		None	No	28	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 506	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 508	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 510	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	956	0	$102	$270	$35	2.3
Classroom 512	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.0	40	0	$4	$0	$0	0.0
Classroom 512	16	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.2	956	0	$102	$540	$70	4.6
Classroom 514	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.0	40	0	$4	$0	$0	0.0
Classroom 514	16	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.2	956	0	$102	$540	$70	4.6
Classroom 518 trainers	11	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	877	0	$93	$270	$35	2.5
Classroom 600	6	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	S	34	4,030	4	None	Yes	6	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	2,781	0.0	280	0	$30	$270	$35	7.9
Classroom 602	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 604	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 605	9	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 606	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 607	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 608	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 609	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 610	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 612	10	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	797	0	$85	$270	$35	2.8
Classroom 701	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 702	10	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	598	0	$64	$270	$35	3.7
Classroom 703	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 704	13	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	777	0	$83	$270	$35	2.8
Classroom 705	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0

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Classroom 706	9	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	538	0	$57	$270	$35	4.1
Classroom 707	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 708	10	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	598	0	$64	$270	$35	3.7
Classroom 710	10	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	598	0	$64	$270	$35	3.7
Classroom 712	12	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	717	0	$76	$270	$35	3.1
Classroom 802	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 804	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 806	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 808	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 810	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 812	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 814	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom 816	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	S	44	2,781		None	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.0	0	0	$0	$0	$0	0.0
Classroom greenhouse	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	4,030	0.0	0	0	$0	$0	$0	0.0
Classroom music rm	20	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	20	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.3	1,594	0	$170	$540	$70	2.8
Conference 1	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	319	0	$34	$270	$35	6.9
Corridor 1 locker weight rm	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 1 locker weight rm	12	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	12	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.1	421	0	$45	$450	$420	0.7
Corridor 2 gym	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 2 gym	57	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	5,070	5	None	Yes	57	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	3,498	0.3	2,513	-1	$268	$2,250	$1,995	1.0
Corridor 2 gym	10	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	5,070	5	None	Yes	10	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	3,498	0.1	441	0	$47	$450	$350	2.1
Corridor 3 700 wing	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 3 700 wing	7	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	7	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.0	245	0	$26	$450	$245	7.8
Corridor 3 700 wing	39	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	39	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.2	1,367	0	$146	$1,575	$1,365	1.4
Corridor 4 600 wing	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Corridor 4 600 wing	38	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	38	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.2	1,332	0	$142	$1,575	$1,330	1.7
Corridor 4 600 wing	3	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	3	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.0	105	0	$11	$225	$105	10.7
Corridor 5 800 wing	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 5 800 wing	8	LED Lamps: (2) 6W G25 Screw-In Lamps	Wall Switch	S	12	4,030	5	None	Yes	8	LED Lamps: (2) 6W G25 Screw-In Lamps	High/Low Control	12	2,781	0.0	132	0	$14	$450	$280	12.1
Corridor 5 800 wing	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	5	None	Yes	14	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,781	0.1	558	0	$59	$675	$490	3.1
Corridor 5 800 wing	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	5	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,781	0.0	239	0	$25	$225	$210	0.6
Corridor 6 200 wing	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 6 200 wing	7	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	7	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.0	245	0	$26	$450	$245	7.8
Corridor 6 200 wing	30	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	30	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.2	1,051	0	$112	$1,125	$1,050	0.7
Corridor 6 400/500 wing	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 6 400/500 wing	69	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	5	None	Yes	69	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,781	0.7	4,125	-1	$439	$2,700	$2,415	0.6
Corridor 6 400/500 wing	15	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	15	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.1	526	0	$56	$675	$525	2.7
Corridor 6 400/500 wing	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030		None	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,030	0.0	0	0	$0	$0	$0	0.0
Corridor 8 300 wing	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 8 300 wing	54	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	54	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.3	1,892	0	$201	$2,025	$1,890	0.7
Corridor 8 300 wing	15	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	15	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.1	526	0	$56	$675	$525	2.7
Corridor 9 main hallway	19	Compact Fluorescent: (2) 26W G25 Screw-In Lamps	Wall Switch	S	52	4,030	3, 5	Relamp	Yes	19	LED Lamps: G25 Lamps	High/Low Control	36	2,781	0.4	2,288	0	$244	$1,858	$741	4.6
Corridor 9 main hallway	13	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	13	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 9 main hallway	14	LED Lamps: (2) 6W G25 Screw-In Lamps	Wall Switch	S	12	4,030	5	None	Yes	14	LED Lamps: (2) 6W G25 Screw-In Lamps	High/Low Control	12	2,781	0.0	231	0	$25	$675	$490	7.5
Corridor 9 main hallway	119	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	119	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.7	4,170	-1	$444	$4,500	$4,165	0.8
Corridor 9 main hallway	21	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	5	None	Yes	21	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,781	0.1	736	0	$78	$900	$735	2.1
Dining Area 1 caf 2	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Dining Area 1 caf 2	18	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	18	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,435	0	$153	$540	$70	3.1
Dining Area 2 teacher	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Dining Area 2 teacher	5	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	399	0	$42	$270	$35	5.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Dining Area 3 caf 1	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Dining Area 3 caf 1	24	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.3	1,913	0	$204	$540	$70	2.3
Electrical Room 1 solar	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Electrical Room 1 solar	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,000	0.0	0	0	$0	$0	$0	0.0
Exterior 2 ground	15	LED Lamps: (1) 10W A19 Screw-In Lamp	Timeclock		10	4,380		None	No	15	LED Lamps: (1) 10W A19 Screw-In Lamp	Timeclock	10	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 2 ground	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch		10	4,030		None	No	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	4,030	0.0	0	0	$0	$0	$0	0.0
Exterior 2 ground	13	LED Lamps: (1) 10W A19 Screw-In Lamp	Timeclock		10	4,380		None	No	13	LED Lamps: (1) 10W A19 Screw-In Lamp	Timeclock	10	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 2 ground	4	LED - Fixtures: Architectural Flood/Spot Luminaire	Photocell		84	4,380		None	No	4	LED - Fixtures: Architectural Flood/Spot Luminaire	Photocell	84	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 2 ground	3	LED - Fixtures: Cobrahead Pole Mount	Timeclock		130	4,380		None	No	3	LED - Fixtures: Cobrahead Pole Mount	Timeclock	130	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 2 ground	2	LED - Fixtures: Flood Fixture	Photocell		84	4,380		None	No	2	LED - Fixtures: Flood Fixture	Photocell	84	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 2 ground	2	LED - Fixtures: Flood Fixture	Timeclock		84	4,380		None	No	2	LED - Fixtures: Flood Fixture	Timeclock	84	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 2 ground	11	LED - Fixtures: Wall Pack	Timeclock		26	4,380		None	No	11	LED - Fixtures: Wall Pack	Timeclock	26	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 3 ground	6	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Photocell		84	4,380		None	No	6	LED - Fixtures: Outdoor Pole/Arm-Mounted Decorative Fixture	Photocell	84	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 4 football field press box	5	Compact Fluorescent: (1) 23W Spiral Plug-In Lamp	Wall Switch		23	500	3	Relamp	No	5	LED Lamps: LED Plug in	Wall Switch	17	500	0.0	17	0	$2	$86	$5	46.2
Exterior 4 football field press box	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch		10	500		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	500	0.0	0	0	$0	$0	$0	0.0
Exterior 4 football field press box	3	LED Lamps: (1) 15W A19 Screw-In Lamp	Wall Switch		15	500		None	No	3	LED Lamps: (1) 15W A19 Screw-In Lamp	Wall Switch	15	500	0.0	0	0	$0	$0	$0	0.0
Exterior 4 football field press box	2	LED - Fixtures: Wall Pack	Photocell		50	4,380		None	No	2	LED - Fixtures: Wall Pack	Photocell	50	4,380	0.0	0	0	$0	$0	$0	0.0
Exterior 5 maintenance shed	2	High-Pressure Sodium: (1) 100W Lamp	Photocell		138	2,000	1	Fixture Replacement	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Photocell	30	2,000	0.0	432	0	$47	$525	$100	9.1
Exterior 5 maintenance shed	2	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch		10	2,000		None	No	2	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	2,000	0.0	0	0	$0	$0	$0	0.0
Exterior 5 maintenance shed	7	Linear Fluorescent - T5HO: 4' T5HO (54W) - 4L	Wall Switch		234	2,000	3	Relamp	No	7	LED - Linear Tubes: (4) 4' T5HO (25W) Lamps	Wall Switch	102	2,000	0.7	2,033	0	$216	$739	$140	2.8
Exterior 6 food shed	1	Incandescent: (1) 100W A19 Screw-In Lamp	Wall Switch		100	500	3	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	15	500	0.1	47	0	$5	$17	$1	3.3
Exterior 6 food shed	2	Incandescent: (1) 43W A19 Screw-In Lamp	Wall Switch		43	500	3	Relamp	No	2	LED Lamps: A19 Lamps	Wall Switch	7	500	0.1	40	0	$4	$34	$2	7.7
Exterior 6 food shed	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch		88	500	2	Relamp & Reballast	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.1	97	0	$10	$206	$30	17.0
Gymnasium 1 aux	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gymnasium 1 aux	12	LED - Fixtures: High-Bay	Wall Switch	S	30	5,070	4	None	Yes	12	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,498	0.1	622	0	$66	$270	$35	3.5

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Gymnasium 2 large	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gymnasium 2 large	4	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	5,070	4	None	Yes	4	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	3,498	0.0	69	0	$7	$270	$35	31.9
Gymnasium 2 large	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	5,070		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	5,070	0.0	0	0	$0	$0	$0	0.0
Gymnasium 2 large	32	LED - Linear Tubes: (6) 4' Lamps	Wall Switch	S	87	5,070	4	None	Yes	32	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	3,498	0.6	4,813	-1	$512	$810	$105	1.4
Gymnasium 3 weight room	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Gymnasium 3 weight room	9	LED - Fixtures: High-Bay	Wall Switch	S	30	5,070	4	None	Yes	9	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,498	0.1	467	0	$50	$270	$35	4.7
Gymnasium 4 cardio	16	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	5,070	4	None	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,498	0.2	1,203	0	$128	$540	$70	3.7
Janitorial 1	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	500		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	500	0.0	0	0	$0	$0	$0	0.0
Janitorial 2	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	500		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	500	0.0	0	0	$0	$0	$0	0.0
Janitorial 3 office	4	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030	4	None	Yes	4	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	2,781	0.0	55	0	$6	$0	$0	0.0
Janitorial 3 office	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.0	199	0	$21	$270	$35	11.1
Janitorial 4	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	500		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	500	0.0	0	0	$0	$0	$0	0.0
Janitorial 5	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	500		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	500	0.0	0	0	$0	$0	$0	0.0
Janitorial 6	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	500		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	500	0.0	0	0	$0	$0	$0	0.0
Janitorial 7	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	500		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	500	0.0	0	0	$0	$0	$0	0.0
Kitchen	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Kitchen	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030	4	None	Yes	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	2,781	0.0	82	0	$9	$270	$35	26.8
Kitchen	6	LED Lamps: (3) 10W A19 Screw-In Lamps	Wall Switch	S	10	4,030	4	None	Yes	6	LED Lamps: (3) 10W A19 Screw-In Lamps	Occupancy Sensor	10	2,781	0.0	82	0	$9	$270	$35	26.8
Kitchen	22	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.1	877	0	$93	$540	$70	5.0
Library 1	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Library 1	120	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	120	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.8	4,782	-1	$509	$2,160	$280	3.7
Library 1	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	638	0	$68	$270	$35	3.5
Library 1	56	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	56	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.7	4,463	-1	$475	$1,080	$140	2.0
Locker Room 1 boys	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 1 boys	11	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	5,070	4	None	Yes	11	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	3,498	0.0	190	0	$20	$270	$35	11.6

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Locker Room 1 boys	42	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	5,070	4	None	Yes	42	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,498	0.3	2,106	0	$224	$810	$105	3.1
Locker Room 1 boys	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	5,070	4	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,498	0.0	201	0	$21	$270	$35	11.0
Locker Room 1 boys	9	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	5,070	4	None	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,498	0.1	677	0	$72	$270	$35	3.3
Locker Room 1 boys	12	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	5,070	4	None	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,498	0.2	1,203	0	$128	$270	$35	1.8
Locker Room 1 boys	5	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	5,070	4	None	Yes	5	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,498	0.0	220	0	$23	$270	$35	10.0
Locker Room 2 girls	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Locker Room 2 girls	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	5,070	4	None	Yes	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	3,498	0.0	104	0	$11	$270	$35	21.3
Locker Room 2 girls	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	5,070	4	None	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,498	0.1	501	0	$53	$270	$35	4.4
Locker Room 2 girls	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	5,070	4	None	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,498	0.0	150	0	$16	$116	$20	6.0
Locker Room 2 girls	26	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	5,070	4	None	Yes	26	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,498	0.3	2,607	-1	$278	$540	$70	1.7
Locker Room 2 girls	1	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	S	50	5,070	2	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	5,070	0.0	184	0	$20	$65	$6	3.0
Lounge 1	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	638	0	$68	$270	$35	3.5
Mechanical 2 boiler room	9	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	1,200		None	No	9	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,200	0.0	0	0	$0	$0	$0	0.0
Multipurpose 1	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Multipurpose 1	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030	4	None	Yes	6	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	2,781	0.0	82	0	$9	$270	$35	26.8
Multipurpose 1	8	LED Lamps: (2) 10W A19 Screw-In Lamps	Wall Switch	S	10	4,030	4	None	Yes	8	LED Lamps: (2) 10W A19 Screw-In Lamps	Occupancy Sensor	10	2,781	0.0	110	0	$12	$270	$35	20.1
Multipurpose 1	4	LED Lamps: (1) 12W PAR30 Screw-In Lamp	Wall Switch	S	12	4,030	4	None	Yes	4	LED Lamps: (1) 12W PAR30 Screw-In Lamp	Occupancy Sensor	12	2,781	0.0	66	0	$7	$0	$0	0.0
Multipurpose 1	70	LED Lamps: (1) 15W PAR30 Screw-In Lamp	Wall Switch	S	15	4,030	4	None	Yes	70	LED Lamps: (1) 15W PAR30 Screw-In Lamp	Occupancy Sensor	15	2,781	0.2	1,443	0	$154	$1,350	$175	7.6
Multipurpose 1	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030	4	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,781	0.0	120	0	$13	$270	$35	18.5
Multipurpose 1	5	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	399	0	$42	$270	$35	5.5
Office - Enclosed	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	239	0	$25	$270	$35	9.2
Office - Enclosed 13 PD	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030		None	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 15	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	319	0	$34	$270	$35	6.9
Office - Enclosed 15 (1)	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	319	0	$34	$270	$35	6.9
Office - Enclosed 15 (2)	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	239	0	$25	$270	$35	9.2

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office - Enclosed 15 (3)	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	239	0	$25	$270	$35	9.2
Office - Enclosed 15 (3)	2	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	S	26	4,030	4	None	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	2,781	0.0	70	0	$7	$116	$20	12.9
Office - Enclosed 19	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 19	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 19	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	478	0	$51	$270	$35	4.6
Office - Enclosed 200	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 200	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$20	5.7
Office - Enclosed 21	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	239	0	$25	$270	$35	9.2
Office - Enclosed 21	9	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	9	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	717	0	$76	$270	$35	3.1
Office - Enclosed 22	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 22	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	478	0	$51	$270	$35	4.6
Office - Enclosed 23	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	319	0	$34	$270	$35	6.9
Office - Enclosed 24	11	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	877	0	$93	$270	$35	2.5
Office - Enclosed 25	7	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	558	0	$59	$270	$35	4.0
Office - Enclosed 26	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	638	0	$68	$270	$35	3.5
Office - Enclosed 600	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 600	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	S	34	4,030		None	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 601A	4	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	S	34	4,030	4	None	Yes	4	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	2,781	0.0	187	0	$20	$270	$35	11.8
Office - Enclosed 601B	6	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	S	34	4,030	4	None	Yes	6	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	2,781	0.0	280	0	$30	$270	$35	7.9
Office - Enclosed 601C	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	478	0	$51	$270	$35	4.6
Office - Enclosed 603	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	S	34	4,030		None	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 603A	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$20	5.7
Office - Enclosed 603B	6	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	478	0	$51	$270	$35	4.6
Office - Enclosed 603C	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	S	34	4,030		None	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed 9 math	8	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,030	4	None	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,781	0.1	478	0	$51	$270	$35	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Office - Enclosed 9 math	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	319	0	$34	$270	$35	6.9
Office - Enclosed health office	2	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030	4	None	Yes	2	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	2,781	0.0	27	0	$3	$116	$20	32.8
Office - Enclosed health office	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,030		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Enclosed health office	14	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,116	0	$119	$270	$35	2.0
Office - Enclosed Principal	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	319	0	$34	$270	$35	6.9
Office - Open Plan 1 TSS(IT)	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Open Plan 1 TSS(IT)	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,030		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,030	0.0	0	0	$0	$0	$0	0.0
Office - Open Plan 1 TSS(IT)	37	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	37	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.5	2,949	-1	$314	$810	$105	2.2
Office - Open Plan 1 TSS(IT) server	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Office - Open Plan 1 TSS(IT) server	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	638	0	$68	$270	$35	3.5
Office - Open Plan 2 main office	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	80	0	$8	$0	$0	0.0
Office - Open Plan 2 main office	14	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	14	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.2	1,116	0	$119	$270	$35	2.0
Restroom - Female	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,030		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,030	0.0	0	0	$0	$0	$0	0.0
Restroom - Female	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$0	6.8
Restroom - Female 1	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$0	6.8
Restroom - Female 2	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	4,030	0.0	0	0	$0	$0	$0	0.0
Restroom - Female 3	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,030	4	None	Yes	1	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,781	0.0	20	0	$2	$0	$0	0.0
Restroom - Female 3	5	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	399	0	$42	$270	$35	5.5
Restroom - Female 4	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$0	6.8
Restroom - Female 6	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,030	0.0	0	0	$0	$0	$0	0.0
Restroom - Female 6	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	S	34	4,030		None	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	4,030	0.0	0	0	$0	$0	$0	0.0
Restroom - Male	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$0	6.8
Restroom - Male 1	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$0	6.8
Restroom - Male 2	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	4,030		None	No	1	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	4,030	0.0	0	0	$0	$0	$0	0.0
Restroom - Male 3	5	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	399	0	$42	$270	$35	5.5

	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Restroom - Male 4	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$0	6.8
Restroom - Male 5	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,030		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,030	0.0	0	0	$0	$0	$0	0.0
Restroom - Male 5	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.0	159	0	$17	$116	$0	6.8
Restroom - Unisex 1	1	LED Lamps: (3) 10W A19 Screw-In Lamps	Wall Switch	S	10	4,030		None	No	1	LED Lamps: (3) 10W A19 Screw-In Lamps	Wall Switch	10	4,030	0.0	0	0	$0	$0	$0	0.0
Restroom - Unisex 1	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	4,030		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,030	0.0	0	0	$0	$0	$0	0.0
Storage 10	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000	4	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	690	0.0	59	0	$6	$116	$0	18.4
Storage 2 trainers rm	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	690	0.1	79	0	$8	$270	$0	32.1
Storage 3 rm 514 storage	3	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	1,000	4	None	Yes	3	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	690	0.0	10	0	$1	$116	$0	106.5
Storage 3 rm 514 storage	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,000	0.0	0	0	$0	$0	$0	0.0
Storage 402	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000	4	None	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	690	0.0	20	0	$2	$0	$0	0.0
Storage 402	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	690	0.1	79	0	$8	$270	$0	32.1
Storage 5	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000	4	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	690	0.0	59	0	$6	$116	$0	18.4
Storage 6	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	1,000		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,000	0.0	0	0	$0	$0	$0	0.0
Storage 6	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,000	0.0	0	0	$0	$0	$0	0.0
Storage 7	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,000	0.0	0	0	$0	$0	$0	0.0
Storage 8	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	1,000	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	690	0.1	79	0	$8	$270	$0	32.1
Storage 9	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	1,000	4	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	690	0.0	20	0	$2	$116	$0	55.1
Union office	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,030	4	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,781	0.1	319	0	$34	$270	$35	6.9
Mechanical 3	2	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	1,000		None	No	2	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	10	1,000	0.0	0	0	$0	$0	$0	0.0
Storage 1 shorting range	14	LED Lamps: (1) 10W A19 Screw-In Lamp	Wall Switch	S	10	500	4	None	Yes	14	LED Lamps: (1) 10W A19 Screw-In Lamp	Occupancy Sensor	10	345	0.0	24	0	$3	$270	$0	106.2

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 309	High School	1	Air Compressor	7.5	85.5%	No	Baldor	Unknown	W	1,000		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Classroom 205	Classroom 205	1	Exhaust Fan	0.2	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Classroom 309	Classroom 309	1	Exhaust Fan	0.2	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Classroom 312 woodshop	Classroom 312 woodshop	1	Exhaust Fan	0.2	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Classroom 312 woodshop	Classroom 312 woodshop	1	Exhaust Fan	0.2	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Classroom 514	Classroom 514	1	Exhaust Fan	0.2	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Locker Room 1 boys	Locker Room 1 boys	1	Exhaust Fan	0.2	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Locker Room 2 girls	Locker Room 2 girls	1	Exhaust Fan	0.2	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2 boiler room	Mechanical 2 boiler room	2	Exhaust Fan	0.2	65.0%	No	Dayton	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage 3 rm 514 storage	Storage 3 rm 514 storage	2	Exhaust Fan	0.1	65.0%	No	Vent A-Kiln Corp	L # P-11M	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	High School	4	Exhaust Fan	1.0	82.5%	No	GE	5K48MN4295X	W	3,740		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	High School	9	Exhaust Fan	0.5	70.0%	No	Unknown	Unknown	W	3,740		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	High School	23	Exhaust Fan	0.3	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	High School	42	Exhaust Fan	0.3	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	High School	17	Exhaust Fan	0.2	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	High School	6	Exhaust Fan	0.8	70.0%	No	Unknown	Unknown	W	3,740		No	70.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2 boiler room	High School	2	Heating Hot Water Pump	3.0	89.5%	Yes	Emerson	R332	W	2,555		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2 boiler room	High School	2	Heating Hot Water Pump	15.0	93.0%	Yes	Marathon	DVC284TTDN16081AAL	B	2,555		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2 boiler room	High School	4	Heating Hot Water Pump	5.0	89.5%	Yes	Emerson	R336	W	2,555		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2 boiler room	High School	2	DHW Circulation Pump	0.3	65.0%	No	Armstrong	160287	W	8,760		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical 2 boiler room	High School	1	DHW Circulation Pump	0.2	65.0%	No	Bell & Gossett	1B61	W	8,760		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2 boiler room	High School	4	Heating Hot Water Pump	15.0	93.0%	Yes	Emerson	A107	W	2,555		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 2 boiler room	High School	2	Heating Hot Water Pump	7.5	91.7%	Yes	Emerson	R340	W	2,555		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 1 auditorium	Auditorium	1	Exhaust Fan	0.3	65.0%	No	Unknown	Unknown	W	3,520		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Storage 3 rm 514 storage	AHU	1	Supply Fan	1.0	82.5%	No	Century	SC-182-FGC3-3	B	3,740	6	Yes	85.5%	No		0.0	89	0	$10	$474	$0	49.0
Exterior 1	Kitchen	1	Makeup Air Fan	3.0	89.5%	No	Unknown	Unknown	W	3,740		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 3	Mechanical 3	1	Exhaust Fan	0.3	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
Classroom 312 woodshop	Workshop	1	Supply Fan	1.0	82.5%	No	Unknown	Unknown	W	3,740		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical 3	Auditorium	1	Supply Fan	10.0	89.5%	No	Century	7-860093-01-OJ	W	3,520	7	No	91.7%	Yes	1	3.0	11,478	0	$1,248	$5,152	$1,100	3.2
Mechanical 3	Auditorium	1	Exhaust Fan	7.5	91.7%	Yes	Century	7-860120-01-OJ	W	3,520		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Guidence offices	1	Supply Fan	1.0	82.5%	No	Unknown	Unknown	B	3,740	6	Yes	85.5%	No		0.0	89	0	$10	$474	$0	49.0
Exterior 1	Server room	1	Supply Fan	3.0	89.5%	No	Unknown	Unknown	W	3,740		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
Exterior 1	Media center	2	Supply Fan	3.0	86.5%	No	Unknown	Unknown	W	3,740	7	No	89.5%	Yes	2	1.8	7,695	0	$836	$7,768	$400	8.8
Exterior 1	Media center	1	Supply Fan	5.0	87.5%	No	Unknown	Unknown	W	3,740	7	No	89.5%	Yes	1	1.5	6,219	0	$676	$4,076	$900	4.7
Exterior 1	Gym	4	Supply Fan	3.0	86.5%	No	Dayton	4LX07G	B	3,740	7	No	89.5%	Yes	4	3.6	15,390	0	$1,673	$15,536	$800	8.8
Exterior 1	Girls locker room	1	Exhaust Fan	3.0	86.5%	No	Century	9-390513	B	3,740	6	Yes	89.5%	No		0.0	243	0	$26	$876	$0	33.1
High school	High school	68	Supply Fan	0.1	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
High school	High school	95	Supply Fan	0.3	65.0%	No	Unknown	Unknown	W	3,740		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0

Packaged 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)	Cooling Mode Efficiency (SEER/IEER/EER)	Heating Mode Efficiency	Manufacturer	Model	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/IEER/EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Exterior 1/Cafeteria 1 & 2	Cafeteria 1 & 2	2	Split-System	10.00		10.00		Fuller Johnson	Unknown	B	8	Yes	2	Split-System	10.00		14.00		3.4	3,429	0	$373	$8,447	$1,580	18.4
Exterior 1	High School	1	Split-System	10.00		10.00		Unknown	Unknown	B	8	Yes	1	Split-System	10.00		14.00		1.7	1,714	0	$186	$4,224	$790	18.4
Exterior 1	High School	2	Split-System	3.00		11.00		Lennox	29-036-13Y-OPT	B		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Nurse	1	Split-System	2.50		12.00		Ruud	13AJN30A01	W		No							0.0	0	0	$0	$0	$0	0.0
Library 1	Library 1	4	Electric Resistance Heat		5.12		1 COP	Marley	2576WC	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Gym	2	Forced Air Furnace		160.00		0.8 AFUE	Reznor	Unknown	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Kitchen	1	Forced Air Furnace		223.00		0.8 AFUE	CaptiveAire	A2-D 250-G15	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Guidence offices	1	Package Unit	6.50		10.00		Trane	TCD075C30ABC	B	8	Yes	1	Package Unit	6.50		14.00		1.1	1,114	0	$121	$9,402	$514	73.4
Exterior 1	Server room	1	Package Unit	12.50		11.00		Trane	THD150F3R0B04H0B0A1B6010000000000000	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Media center	2	Package Unit	7.50	104.00	10.00	0.8 AFUE	Lennox	LGA090H2BS3Y	B	8	Yes	2	Package Unit	7.50	104.00	14.00	0.82 Et	2.6	2,571	4	$320	$22,794	$1,185	67.5
Exterior 1	Media center	1	Package Unit	25.00	208.00	9.00	0.8 AFUE	Lennox	LGC300H2	B	8	Yes	1	Package Unit	25.00	208.00	12.50	0.82 Et	4.7	4,667	4	$548	$26,232	$2,125	44.0
Exterior 1	TSS	1	Package Unit	7.50	148.00	11.00	0.82 AFUE	Carrier	48TCED08A2A5A0A0A0	W		No							0.0	0	0	$0	$0	$0	0.0
High school	High school	76	Window AC	2.00		10.30		Friedrich	CP24G30B-A	W		No							0.0	0	0	$0	$0	$0	0.0
High school	High school	2	Window AC	1.50		11.00		Unknown	Unknown	W		No							0.0	0	0	$0	$0	$0	0.0
High school	High school	7	Window AC	1.00		12.00		Friedrich	CCW12B10A	W		No							0.0	0	0	$0	$0	$0	0.0
High school	High school	6	Window AC	0.50		12.10		Electrolux	FFRE0533U1	W		No							0.0	0	0	$0	$0	$0	0.0
Exterior 1	Auditorium	1	Split-System	60.00		11.20		Trane	RAUCC60EBU03ABD000000	B	8	Yes	1	Split-System	60.00		12.50		3.3	3,343	0	$363	$46,000	$5,100	112.6
Exterior 1	Gym	4	Package Unit		219.00		0.81 AFUE	Aaon	RM-018-8-0-A202-349	W		No							0.0	0	0	$0	$0	$0	0.0

Space Heating Boiler 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)	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical 2	High School	6	Condensing Hot Water Boiler	1,720	Aerco	Benchmark 2.0	W		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical 2	High school	2	Boiler	Lochinvar	CFN401PM	B		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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
High school	10	37	Faucet Aerator (Kitchen)	2.50	1.50	0.0	0	10	$110	$265	$74	1.7
High school	10	55	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	26	$278	$394	$220	0.6
High school	10	2	Showerhead	2.50	1.50	0.0	0	2	$17	$179	$30	8.9

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)	Unknown	Unknown	11, 12	Yes	Yes	Yes	0.1	1,889	0	$205	$2,799	$205	12.6
Kitchen	1	Medium Temp Freezer (0F to 30F)	Unknown	Unknown	11, 12	Yes	Yes	Yes	0.1	1,889	0	$205	$2,799	$205	12.6

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Stand-Up Refrigerator, Glass Door (>50 cu. ft.)	TRUE	GDM-72	Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)	Unknown	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	Unknown	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	Unknown	Unknown	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	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Ice Making Head (<450 lbs/day), Batch	Manitowoc	ID853W-261	No		No	0.0	0	0	$0	$0	$0	0.0
Trainers room	1	Ice Making Head (<450 lbs/day), Batch	Manitowoc	ID0606W-261	No		No	0.0	0	0	$0	$0	$0	0.0

Novelty Cooler Inventory & Recommendations

	Existing Conditions				Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Cooler Description	Manufacturer	Model	ECM #	Install Automatic Shutoff Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Snapple	TRUE	GDM-37		No	0.00	0	0	$0	$0	$0	0.0
Kitchen	4	Small drink cooler	TRUE	GDM-12-HC		No	0.00	0	0	$0	$0	$0	0.0
Food stand	2	Coca Cola	Beverage Air	MT38		No	0.00	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Fryer	Globe	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Fryer	Pitco	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Griddle (3 Feet Width)	Wyott	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	4	Insulated Food Holding Cabinet (Full Size)	Metro	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Rack Oven (Double)	Vulcan	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Half Size)	Vulcan	Unknown	No		No	0.0	0	0	$0	$0	$0	0.0
Classroom 205	5	Electric Convection Oven (Half Size)	GE	JBS60RK4SS	No		No	0.0	0	0	$0	$0	$0	0.0

Dishwasher Inventory & Recommendations

	Existing Conditions							Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Manufacturer	Model	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	Estimated M&L Cost ($)	Total Incentives	Payback w/ Incentives in Years
Kitchen	1	Single Tank Conveyor (High Temp)	Unknown	Unknown	Electric	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?	Manufacturer	Model
High school	2	Clothes dryer	5,600	Yes	GE	GFD45ESSM1WW
High school	2	Clothes Washer	500	Yes	GE	Unknown
High school	9	Coffee machine	800	No	Unknown	Unknown
High school	133	Desktop	270	Yes	Unknown	Unknown
High school	1	Laptop	75	Yes	Unknown	Unknown
High school	931	Chromebook	37	No	Chromebook	Unknown
Art room	2	Kiln	6,760	No	Skutt	KMT-1027
High school	17	Fan	200	No	Unknown	Unknown
High school	18	Microwave	800	No	Unknown	Unknown
Wood shop	20	Misc. tools	2,500	No	Unknown	Unknown
Gymnasium 4	7	Cardio equipment	1,800	No	Unknown	Unknown
High school	3	Paper shredder	200	No	Unknown	Unknown
High school	20	Printer	600	No	Unknown	Unknown
High school	9	Copier	1,800	No	Unknown	Unknown
High school	72	Projector	200	Yes	Unknown	Unknown
High school	8	Mini refrigerator	126	No	Unknown	Unknown
High school	12	Refrigerator	383	No	Unknown	Unknown
High school	11	Television	130	No	Unknown	Unknown
High school	1	Toaster	1,000	No	Unknown	Unknown
High school	4	Toaster oven	1,500	No	Unknown	Unknown
High school	3	Water cooler	600	No	Unknown	Unknown

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	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Gym corridor	4	Refrigerated	13	Yes	0.7	6,447	0	$701	$920	$200	1.0
Cafeteria 2	2	Glass Fronted Refrigerated	13	Yes	0.3	2,418	0	$263	$460	$100	1.4
Cafeteria 2	1	Refrigerated	13	Yes	0.2	1,612	0	$175	$230	$50	1.0
Cafeteria 2	1	Non-Refrigerated	13	Yes	0.0	343	0	$37	$230	$0	6.2
Cafeteria 1	1	Glass Fronted Refrigerated	13	Yes	0.1	1,209	0	$131	$230	$50	1.4
Cafeteria 1	1	Refrigerated	13	Yes	0.2	1,612	0	$175	$230	$50	1.0
Cafeteria 1	1	Non-Refrigerated	13	Yes	0.0	343	0	$37	$230	$0	6.2

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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

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ENERGY STAR® Statement of Energy Performance

52

ENERGY STAR® Score[1]

Parsippany High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 174,377
Built: 1967

For Year Ending: January 31, 2020
Date Generated: July 28, 2021

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
Parsippany High School 309 Baldwin Road Parsippany, New Jersey 07054	Parsippany - Troy Hills Board of Education 292 Parsippany Road Parsippany, NJ 07054 (973) 263-7200	Dr. Alfred Savio 292 Parsippany Road Parsippany, NJ 07054 (973) 263-7200 x 7212 asavio@pthsd.net

Property ID: 16057038

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
80.5 kBtu/ft²

Source EUI
132.6 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	4,791,798 (34%)
Electric - Solar (kBtu)	63,388 (0%)
Natural Gas (kBtu)	9,184,744 (65%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	82.3
National Median Source EUI (kBtu/ft²)	135.6
% Diff from National Median Source EUI	-2%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	952

Signature & Stamp of Verifying Professional

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

LP Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-_____
_____

Professional Engineer or Registered Architect Stamp (if applicable)

APPENDIX C: GLOSSARY

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

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

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