



Local Government Energy Audit Report

Ramsey High School

September 20, 2019

Prepared for:

Ramsey Board of Education

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Disclaimer

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

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

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

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

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

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Appendix A: Equipment Inventory & Recommendations A-1

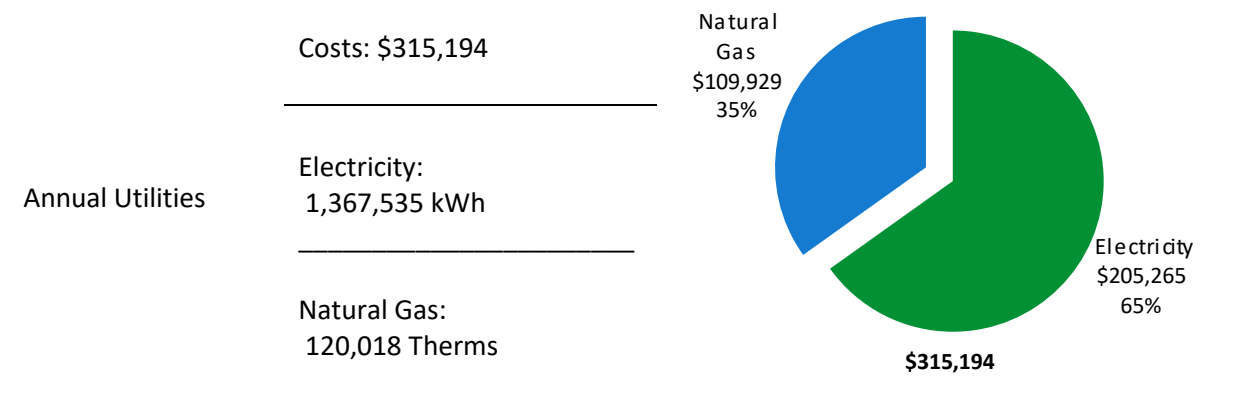
Appendix B: ENERGY STAR® Statement of Energy Performance B-1

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1 EXECUTIVE SUMMARY

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

BUILDING PERFORMANCE REPORT



<p>ENERGY STAR® Benchmarking Score</p>	<p>57 (1-100 scale)</p>	<p>This building performs at or below the national average. This report contains suggestions about how to improve building performance and reduce energy costs.</p>
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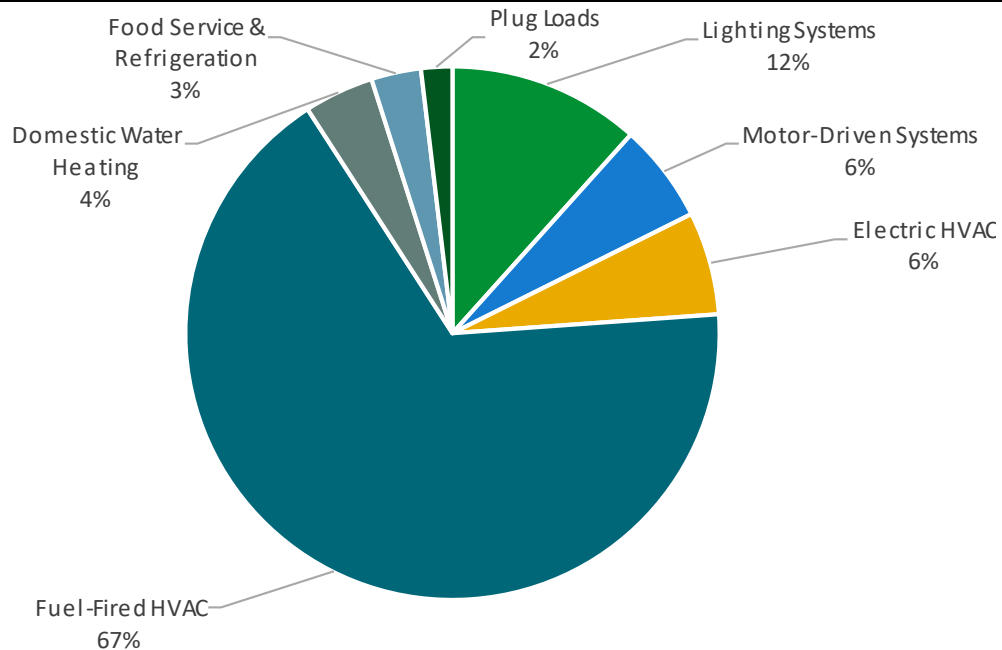


Figure 1 - Energy Use by System

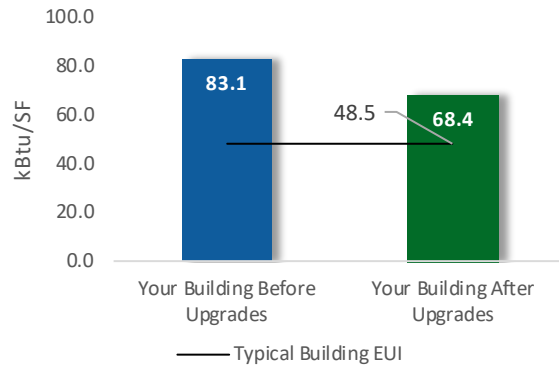
POTENTIAL IMPROVEMENTS



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.

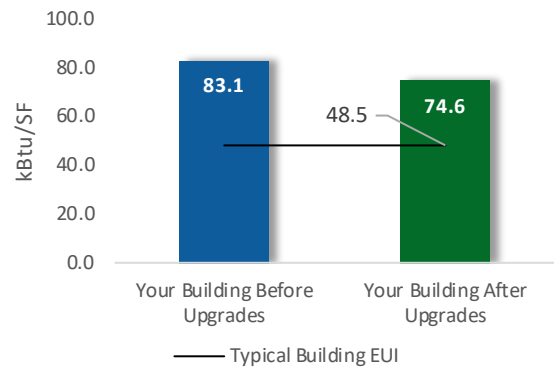
Scenario 1: Full Package (all evaluated measures)

Installation Cost	\$782,018
Potential Rebates & Incentives ¹	\$45,183
Annual Cost Savings	\$86,751
Annual Energy Savings	Electricity: 502,580 kWh Natural Gas: 12,353 Therms
Greenhouse Gas Emission Savings	325 Tons
Simple Payback	8.5 Years
Site Energy Savings (all utilities)	18%



Scenario 2: Cost Effective Package²

Installation Cost	\$341,737
Potential Rebates & Incentives	\$41,202
Annual Cost Savings	\$74,110
Annual Energy Savings	Electricity: 492,589 kWh Natural Gas: 189 Therms
Greenhouse Gas Emission Savings	249 Tons
Simple Payback	4.1 Years
Site Energy Savings (all utilities)	10%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

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

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

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Lifetime Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		322,272	112.2	-57	\$47,855	\$717,820	\$174,060	\$28,242	\$145,818	3.0	317,906
ECM 1	Install LED Fixtures	51,603	65.0	0	\$7,745	\$116,182	\$104,223	\$11,200	\$93,023	12.0	51,963
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,100	0.7	0	\$311	\$4,668	\$1,408	\$170	\$1,238	4.0	2,063
ECM 3	Retrofit Fixtures with LED Lamps	268,570	46.5	-56	\$39,798	\$596,971	\$68,429	\$16,872	\$51,557	1.3	263,879
Lighting Control Measures		63,877	10.6	-13	\$9,466	\$75,724	\$68,032	\$6,225	\$61,807	6.5	62,760
ECM 4	Install Occupancy Sensor Lighting Controls	52,774	8.8	-11	\$7,820	\$62,561	\$54,132	\$6,225	\$47,907	6.1	51,851
ECM 5	Install High/Low Lighting Controls	11,103	1.8	-2	\$1,645	\$13,163	\$13,900	\$0	\$13,900	8.4	10,909
Motor Upgrades		1,010	0.3	0	\$152	\$2,274	\$4,555	\$0	\$4,555	30.0	1,017
ECM 6	Premium Efficiency Motors	1,010	0.3	0	\$152	\$2,274	\$4,555	\$0	\$4,555	30.0	1,017
Variable Frequency Drive (VFD) Measures		91,474	23.1	0	\$13,730	\$205,952	\$87,647	\$6,285	\$81,362	5.9	92,114
ECM 7	Install VFDs on Constant Volume (CV) Fans	63,612	14.8	0	\$9,548	\$143,221	\$58,048	\$3,960	\$54,088	5.7	64,057
ECM 8	Install VFDs on Heating Water Pumps	19,302	3.7	0	\$2,897	\$43,458	\$19,779	\$0	\$19,779	6.8	19,437
ECM 9	Install Boiler Draft Fan VFDs	8,560	4.6	0	\$1,285	\$19,272	\$9,819	\$2,325	\$7,494	5.8	8,620
Electric Unitary HVAC Measures		8,981	7.9	0	\$1,348	\$20,220	\$65,490	\$3,071	\$62,419	46.3	9,043
ECM 10	Install High Efficiency Air Conditioning Units	8,981	7.9	0	\$1,348	\$20,220	\$65,490	\$3,071	\$62,419	46.3	9,043
Gas Heating (HVAC/Process) Replacement		0	0.0	1,124	\$10,296	\$205,916	\$344,180	\$0	\$344,180	33.4	131,614
ECM 11	Install High Efficiency Steam Boilers	0	0.0	1,124	\$10,296	\$205,916	\$344,180	\$0	\$344,180	33.4	131,614
HVAC System Improvements		4,490	0.0	65	\$1,272	\$19,087	\$5,438	\$0	\$5,438	4.3	12,172
ECM 12	Implement Demand Control Ventilation (DCV)	4,490	0.0	65	\$1,272	\$19,087	\$5,438	\$0	\$5,438	4.3	12,172
Domestic Water Heating Upgrade		0	0.0	116	\$1,061	\$14,835	\$26,158	\$910	\$25,248	23.8	13,557
ECM 13	Install High Efficiency Gas-Fired Water Heater	0	0.0	92	\$846	\$12,687	\$26,057	\$910	\$25,147	29.7	10,812
ECM 14	Install Low-Flow DHW Devices	0	0.0	23	\$215	\$2,147	\$100	\$0	\$100	0.5	2,745
Food Service & Refrigeration Measures		10,475	1.0	0	\$1,572	\$13,143	\$6,460	\$450	\$6,010	3.8	10,548
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors	917	0.1	0	\$138	\$2,066	\$1,213	\$0	\$1,213	8.8	924
ECM 16	Refrigeration Controls	2,365	0.0	0	\$355	\$5,679	\$3,867	\$200	\$3,667	10.3	2,381
ECM 17	Vending Machine Control	7,193	0.8	0	\$1,080	\$5,398	\$1,380	\$250	\$1,130	1.0	7,243
TOTALS (COST EFFECTIVE MEASURES)		492,589	146.8	19	\$74,110	\$1,033,874	\$341,737	\$41,202	\$300,535	4.1	498,245
TOTALS (ALL MEASURES)		502,580	155.0	1,235	\$86,751	\$1,274,971	\$782,018	\$45,183	\$736,835	8.5	650,732

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

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

Figure 2 – Evaluated Energy Improvements

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

1.1 Planning Your Project

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

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

Pick Your Installation Approach

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

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

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	X		
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	X		
ECM 3	Retrofit Fixtures with LED Lamps	X		
ECM 4	Install Occupancy Sensor Lighting Controls	X		
ECM 5	Install High/Low Lighting Controls			
ECM 6	Premium Efficiency Motors			
ECM 7	Install VFDs on Constant Volume (CV) HVAC	X		
ECM 8	Install VFDs on Hot Water Pumps			
ECM 9	Install Boiler Draft Fan VFDs	X		
ECM 10	Install High Efficiency Electric AC	X		
ECM 11	Install High Efficiency Steam Boilers			
ECM 12	Implement Demand Control Ventilation			
ECM 13	Install High Efficiency Gas Water Heater	X		
ECM 14	Install Low-Flow Domestic Hot Water Devices			
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors			
ECM 16	Refrigeration Controls	X		
ECM 17	Vending Machine Control	X		

Figure 3 – Funding Options



New Jersey's Clean Energy Programs At-A-Glance

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

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

Individual Measures with SmartStart

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

Turnkey Installation with Direct Install

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

Whole Building Approach with Pay for Performance

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

More Options from Around the State

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

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

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

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

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce 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 (NJBP) has sponsored this Local Government Energy Audit (LGEA) Report for Ramsey 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. This report also contains valuable information on financial incentives from New Jersey’s Clean Energy Program (NJCEP) for implementing ECMs.

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

2.1 Site Overview

On March 26, 2019, TRC performed an energy audit at Ramsey High School located in Ramsey, New Jersey. TRC met with Greg M. Bohacik to review the facility operations and help focus our investigation on specific energy-using systems.

Ramsey High School is a 3-story, 200,520 square foot building built in 1936. Spaces include: classrooms, old and new gymnasium, auditorium, offices, cafeteria, corridors, stairwells, a commercial kitchen, and basement mechanical space.

Over the last several years the facility has replaced nearly all of its existing T12 fluorescent fixtures with T8 fluorescent fixtures. Old T8 lighting fixtures in the main office area have been replaced with efficient LED sources.

2.2 Building Occupancy

The facility is occupied from September through June. Typical weekday occupancy totals 837 staff and students.

Summer occupancy includes continuing maintenance activities. There are gym activities on Saturday only.

Building Name	Weekday/Weekend	Operating Schedule
Ramsey High School	Weekday	Operation: 5:00 AM - 10:00 PM; School: 8:00 AM - 3:00 PM
	Weekend	Saturday Gym Only: 9:00 AM - 2:00 PM; Sunday Closed

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

The exterior walls on the front side of the building are made of brick whereas the walls on the backside of the building are made from concrete masonry units (CMUs) with a decorative veneer and painted interior finish.

The flat roof section is supported with steel trusses and a reinforced concrete deck finished with an insulated layer and a covering of EPDM white membrane.

Steel trusses support a pitched roof with a metal deck covered with asphalt shingles. The roof encloses semi-conditioned space (e.g., space that is not intentionally heated but escaping heat from HVAC equipment causes the space to be conditioned). The thermal barrier is between this space and the conditioned space below.

Front side windows are double pane glazed with low-e glass and have aluminum frames with a thermal break. The back windows are single hung with aluminum frames. The glass-to-frame seals of the single pane windows are in good condition. The operable window weather seals are also in good condition, showing no evidence of excessive wear. Exterior doors are FRP (fiber-reinforced plastic) aluminum frames with single pane glass and are in good condition with undamaged door seals. Degraded window and door seals increase drafts and outside air infiltration.



Exterior Door



Flat roof



Windows and shingles



Walls

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt linear fluorescent T8 lamps. The office area is illuminated by LED fixtures. There are also several 40-Watt T12 fixtures. Additionally, there are some compact fluorescent lamps (CFL), incandescent, and LED general purpose lamps. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use magnetic ballasts.

Fixture types include 2, 3 and 4-lamp, 2 and 4-foot long troffer and recessed mounted fixtures and 2-foot fixtures with U-bend tube lamps.

The old gymnasium fixtures have 4-lamp high bay (HO) T5 linear fluorescent lamps and the new gym has 6-lamp T5HO linear fluorescent fixtures. Both gym fixtures are controlled by occupancy sensors. Auditorium fixtures have LED lamps and incandescent high-hat fixtures and are controlled by a dimmer switch.

Cafeteria have recessed 8' and 4' long LED strips and are controlled by a dimmer switch.

All exit signs are LED units.

Most fixtures are in good condition. Interior lighting levels were generally sufficient.

Lighting fixtures in main office are controlled by occupancy sensors, however, most lighting fixtures are controlled manually by wall switches.



Classroom lighting



Media center lighting



Cafeteria lighting



Gym lighting



Wall pack



Field lighting



Decorative wall mounted fixture



Roadway lighting

Exterior lighting includes wall packs, wall sconces, flood lights, emergency lights, and wall mounted fixtures with LED lamps. The pole mounted roadway fixtures incorporate LED lamps.

The athletic fields are illuminated with flood lights that contain high bay metal halide lamps. They are controlled manually from a breaker panel.

In general, exterior light fixtures are controlled by a BMS located in the superintendent's office.

2.5 Air Handling Systems

Unit Ventilators

The unit ventilators that supply heating to the “old section” classrooms are equipped with 1/12 hp supply fan motors. Control is provided by a pneumatic thermostat. This system is original to the building and appears to be in fair operating condition.

Packaged Units

Classrooms, offices, and the main office area are conditioned by packaged air conditioning and split system heat pump units controlled by the EMS. These units have heating capacities ranging from 16.40 MBh to 188 MBh and cooling capacities that range from 0.75-ton to 14-tons. They range in efficiency between 8.5 EER to 13 EER.

The old gym and new gym are served by two 20-ton and two 50-ton packaged roof top units (RTUs) with gas fired furnaces. Furnace heating capacities range from 328 MBh to 864 MBh. These units are equipped with economizers that are in good condition.

The media center is served by a 20-ton Lennox roof top cooling only unit with an efficiency of 12 EER.

The boys’ and girls’ locker rooms have heating ventilator (HV) units with 2 hp and 1.5 hp supply fan motors respectively.

Heating and ventilation requirements for six second floor classrooms are met by Airedale stand-alone unit ventilators with 1/3 hp supply fan motors that are controlled by the BMS.

A total of 25 exhaust fans are located on the roof with fan motors ranging in size from 0.1 hp to 1 hp.

Refer to Appendix A for detailed information about each unit.



Condensing Units



Roof top unit



Exhaust fan



Split system AC

2.6 Heating Hot Water Systems

Two 10,043 MBh steam boilers serve a majority of the building heating loads. The burners are non-modulating with a nominal efficiency of 72%. The boilers are configured in a lead-lag control scheme. Both boilers are required under high load conditions. They were installed in 1998 and are in fair condition. Each boiler has a 7.5 hp combustion air fan. There is a service contract in place for the boilers.

There are two steam to hot water heat exchangers that provide hot water for the 1965 and 1975 new addition wings. The boiler feed water system has three 1 hp feed water pumps along with two 5 hp vacuum pumps. Boilers also have two 5 hp condensing pumps.

The boilers serve a primary/secondary distribution system with two constant speed 7.5 hp pumps circulating the primary loop and two constant speed 10 hp heating hot water pumps operating in lead/lag fashion on the secondary loop. A three-way valve controls the secondary loop temperature via the EMS.

At the time of site visit, the hot water loop temperature for the 1965 and 1975 wings were 76°F and 86°F respectively, while the outside air temperature was 58°F.



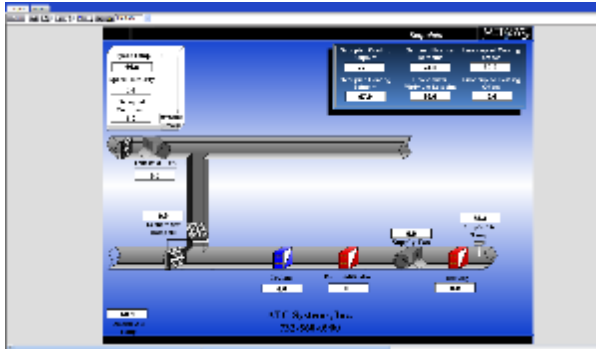
Boilers



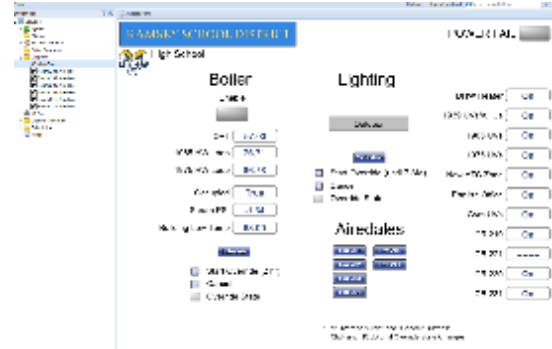
Heating hot water pumps

2.7 Building Energy Management Systems (EMS)

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



RTU



Lighting



Stand Up unit ventilators



Split system AC

2.8 Domestic Hot Water

Hot water is produced with a 200-gallon A.O. Smith 520 MBh gas-fired storage tank water heater with an 82.5% thermal efficiency. It was installed in 1998 and is in fair condition.

One 0.2 hp circulation pump distributes hot water to end uses. The circulation pump operates continuously. The domestic hot water pipes are insulated, and the insulation is in good condition.



Water Heater



Water heater nameplate

2.9 Food Service Equipment

The kitchen has mixed gas and electric equipment that is used to prepare meals for students. Most cooking is done using a convection electric oven, an electric griddle, and a gas griddle. Bulk prepared foods are held in several electric holding cabinets. Equipment is high efficiency and is in good condition.

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



Conveyer oven



Gas stove with griddle

2.10 Refrigeration

The kitchen has three stand-up refrigerators with a mix of solid and glass doors. There is also an energy efficient stand-up solid door freezer. All equipment is high efficiency and in good condition.

The walk-in refrigerator has an estimated 0.87-ton compressor located on the roof and a two-fan evaporator. The walk-in medium temperature freezer has a 0.75-ton compressor located on the roof and a 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 units



Stand up refrigerator

2.11 Plug Load & Vending Machines

The utility bill analysis indicates that plug loads consume approximately 2% percent of total building energy use. This is lower than a typical building.

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

There are approximately 302 computer work stations throughout the facility. Plug loads throughout the building include general cafeteria, woodshop and office equipment. There are classroom typical loads such as smart boards, projectors, and printers.

There are several residential style refrigerators throughout the building that are used to store staff lunches and cold beverages. These vary in condition and efficiency.

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



Kiln in art room



Copy Machine



Washer and dryer



Computer lab

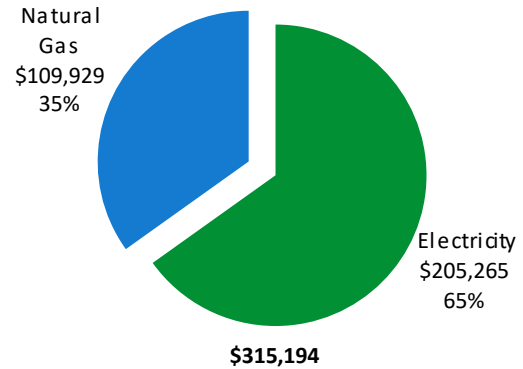
2.12 Water-Using Systems

There are 16 restrooms with toilets, urinals, and sinks. Faucet flow rates are at 1.5 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1 gpf.

3 ENERGY USE AND COSTS

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

Utility Summary		
Fuel	Usage	Cost
Electricity	1,367,535 kWh	\$205,265
Natural Gas	120,018 Therms	\$109,929
Total		\$315,194



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

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

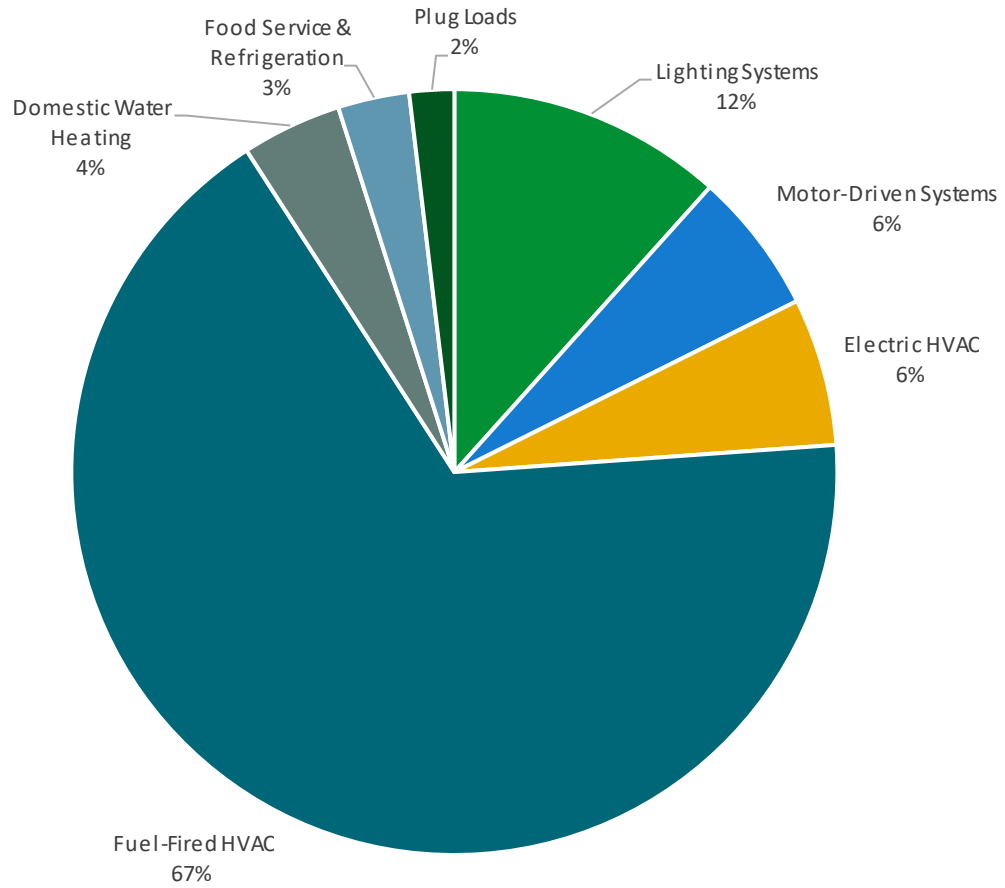
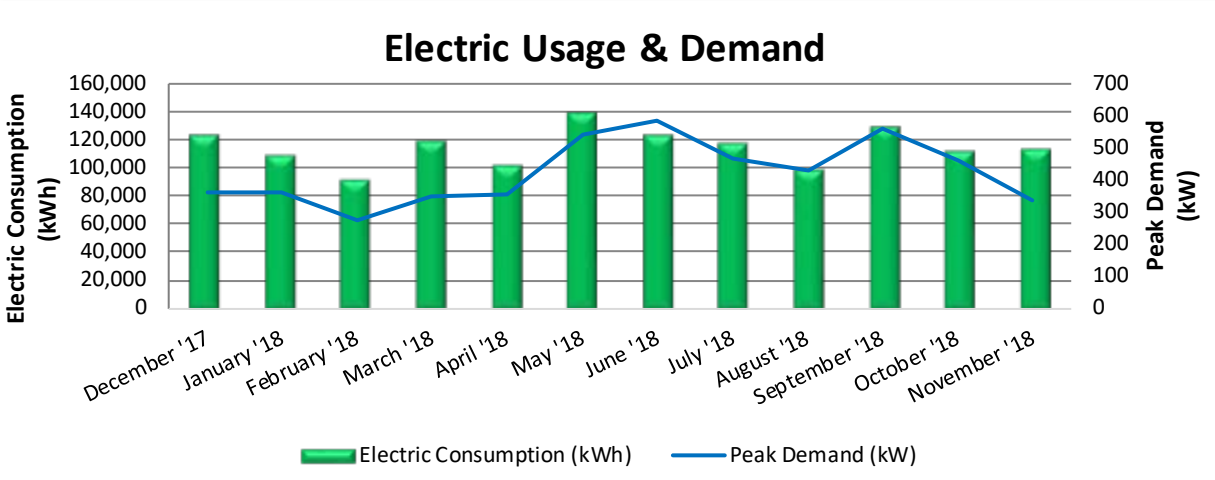


Figure 5 - Energy Balance

3.1 Electricity

Rockland Electric delivers electricity under rate class Monthly General Service Secondary, with electric production provided by Direct Energy, a third-party supplier.



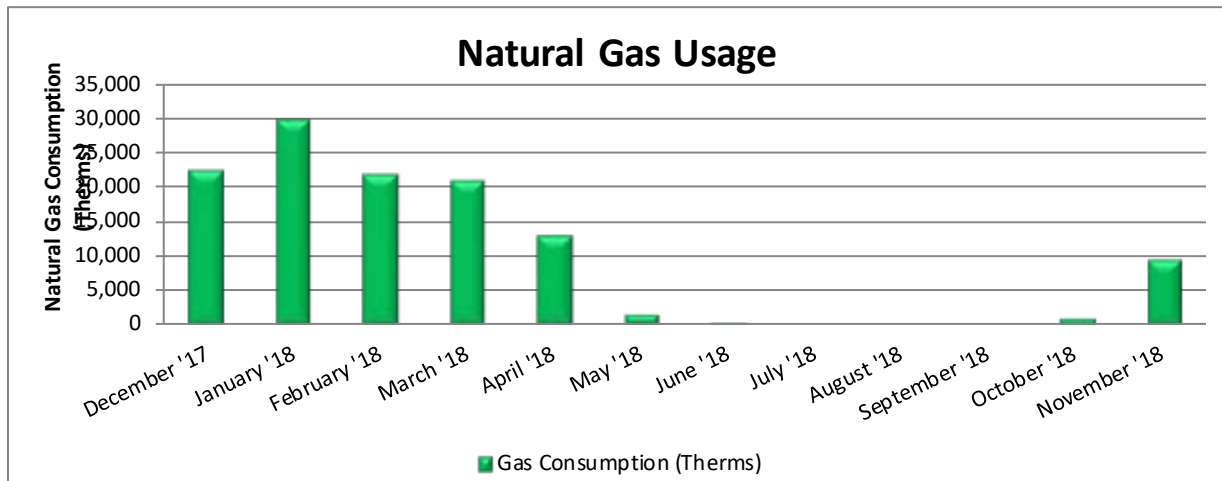
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
1/3/18	31	122,317	362	\$1,615	\$17,407
2/2/18	30	108,192	362	\$1,633	\$16,237
3/5/18	31	91,847	275	\$1,546	\$14,102
4/3/18	29	117,579	348	\$1,630	\$18,367
5/2/18	29	100,662	355	\$1,582	\$15,067
6/5/18	34	137,593	541	\$2,031	\$20,691
7/5/18	30	123,137	584	\$2,536	\$19,681
8/6/18	32	116,578	468	\$2,025	\$18,216
9/4/18	29	98,698	432	\$1,775	\$14,848
10/1/18	27	128,068	559	\$2,202	\$18,986
10/31/18	30	110,720	458	\$1,638	\$15,840
12/3/18	33	112,144	334	\$1,445	\$15,823
Totals	365	1,367,535	584	\$21,657	\$205,265
Annual	365	1,367,535	584	\$21,657	\$205,265

Notes:

- Peak demand of 584 kW occurred in June '18.
- The average electric cost over the past 12 months was \$0.150/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.

3.2 Natural Gas

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



Gas Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
12/19/17	32	22,377	\$20,232
1/20/18	32	29,691	\$27,073
2/21/18	32	21,750	\$21,054
3/23/18	30	20,913	\$20,388
4/20/18	28	12,866	\$8,138
5/21/18	31	1,631	\$1,125
6/20/18	30	18	\$118
7/23/18	33	0	\$0
8/20/18	28	0	\$214
9/19/18	30	0	\$107
10/18/18	29	894	\$667
11/16/18	29	9,548	\$10,512
Totals	364	119,689	\$109,628
Annual	365	120,018	\$109,929

Notes:

- The average gas cost for the past 12 months is \$0.916/therm, which is the blended rate used throughout the analysis.

3.3 Benchmarking

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

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

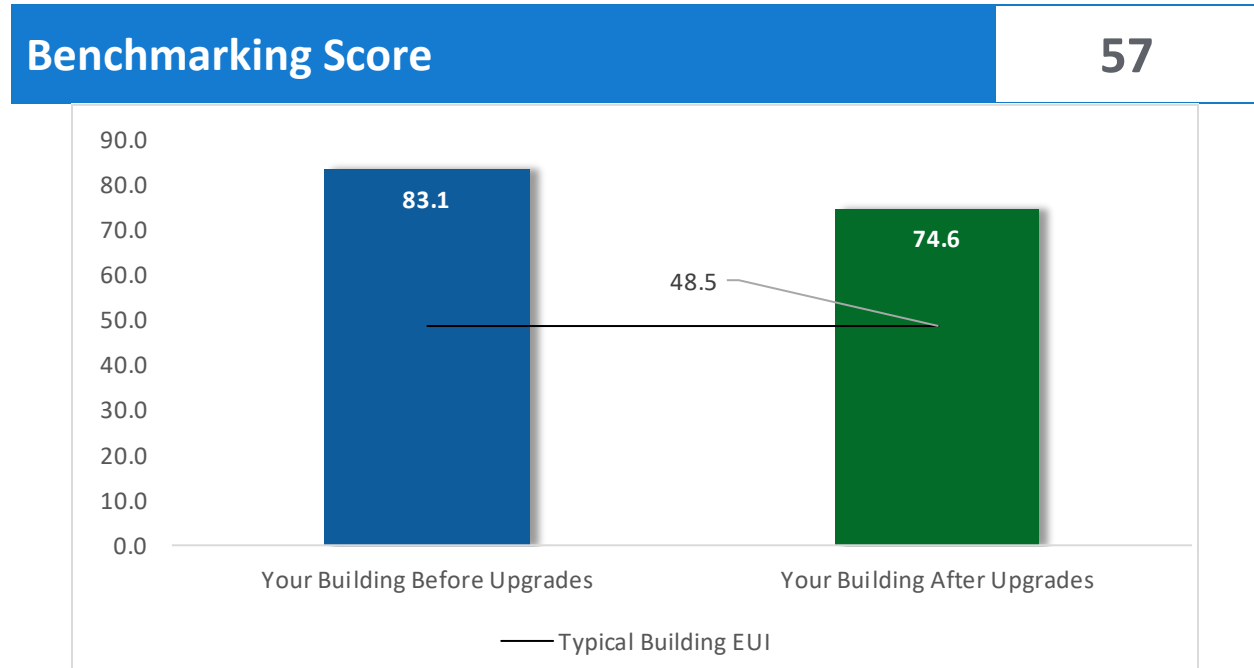


Figure 6 - Energy Use Intensity Comparison

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

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

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 website³.

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

4 ENERGY CONSERVATION MEASURES

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

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

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

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

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	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		322,272	112.2	-57	\$47,855	\$174,060	\$28,242	\$145,818	3.0	317,906
ECM 1	Install LED Fixtures	51,603	65.0	0	\$7,745	\$104,223	\$11,200	\$93,023	12.0	51,963
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,100	0.7	0	\$311	\$1,408	\$170	\$1,238	4.0	2,063
ECM 3	Retrofit Fixtures with LED Lamps	268,570	46.5	-56	\$39,798	\$68,429	\$16,872	\$51,557	1.3	263,879
Lighting Control Measures		63,877	10.6	-13	\$9,466	\$68,032	\$6,225	\$61,807	6.5	62,760
ECM 4	Install Occupancy Sensor Lighting Controls	52,774	8.8	-11	\$7,820	\$54,132	\$6,225	\$47,907	6.1	51,851
ECM 5	Install High/Low Lighting Controls	11,103	1.8	-2	\$1,645	\$13,900	\$0	\$13,900	8.4	10,909
Motor Upgrades		1,010	0.3	0	\$152	\$4,555	\$0	\$4,555	30.0	1,017
ECM 6	Premium Efficiency Motors	1,010	0.3	0	\$152	\$4,555	\$0	\$4,555	30.0	1,017
Variable Frequency Drive (VFD) Measures		91,474	23.1	0	\$13,730	\$87,647	\$6,285	\$81,362	5.9	92,114
ECM 7	Install VFDs on Constant Volume (CV) Fans	63,612	14.8	0	\$9,548	\$58,048	\$3,960	\$54,088	5.7	64,057
ECM 8	Install VFDs on Heating Water Pumps	19,302	3.7	0	\$2,897	\$19,779	\$0	\$19,779	6.8	19,437
ECM 9	Install Boiler Draft Fan VFDs	8,560	4.6	0	\$1,285	\$9,819	\$2,325	\$7,494	5.8	8,620
Electric Unitary HVAC Measures		8,981	7.9	0	\$1,348	\$65,490	\$3,071	\$62,419	46.3	9,043
ECM 10	Install High Efficiency Air Conditioning Units	8,981	7.9	0	\$1,348	\$65,490	\$3,071	\$62,419	46.3	9,043
Gas Heating (HVAC/Process) Replacement		0	0.0	1,124	\$10,296	\$344,180	\$0	\$344,180	33.4	131,614
ECM 11	Install High Efficiency Steam Boilers	0	0.0	1,124	\$10,296	\$344,180	\$0	\$344,180	33.4	131,614
HVAC System Improvements		4,490	0.0	65	\$1,272	\$5,438	\$0	\$5,438	4.3	12,172
ECM 12	Implement Demand Control Ventilation (DCV)	4,490	0.0	65	\$1,272	\$5,438	\$0	\$5,438	4.3	12,172
Domestic Water Heating Upgrade		0	0.0	116	\$1,061	\$26,158	\$910	\$25,248	23.8	13,557
ECM 13	Install High Efficiency Gas-Fired Water Heater	0	0.0	92	\$846	\$26,057	\$910	\$25,147	29.7	10,812
ECM 14	Install Low-Flow DHW Devices	0	0.0	23	\$215	\$100	\$0	\$100	0.5	2,745
Food Service & Refrigeration Measures		10,475	1.0	0	\$1,572	\$6,460	\$450	\$6,010	3.8	10,548
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors	917	0.1	0	\$138	\$1,213	\$0	\$1,213	8.8	924
ECM 16	Refrigeration Controls	2,365	0.0	0	\$355	\$3,867	\$200	\$3,667	10.3	2,381
ECM 17	Vending Machine Control	7,193	0.8	0	\$1,080	\$1,380	\$250	\$1,130	1.0	7,243
TOTALS		502,580	155.0	1,235	\$86,751	\$782,018	\$45,183	\$736,835	8.5	650,732

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

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

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		322,272	112.2	-57	\$47,855	\$174,060	\$28,242	\$145,818	3.0	317,906
ECM 1	Install LED Fixtures	51,603	65.0	0	\$7,745	\$104,223	\$11,200	\$93,023	12.0	51,963
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,100	0.7	0	\$311	\$1,408	\$170	\$1,238	4.0	2,063
ECM 3	Retrofit Fixtures with LED Lamps	268,570	46.5	-56	\$39,798	\$68,429	\$16,872	\$51,557	1.3	263,879
Lighting Control Measures		63,877	10.6	-13	\$9,466	\$68,032	\$6,225	\$61,807	6.5	62,760
ECM 4	Install Occupancy Sensor Lighting Controls	52,774	8.8	-11	\$7,820	\$54,132	\$6,225	\$47,907	6.1	51,851
ECM 5	Install High/Low Lighting Controls	11,103	1.8	-2	\$1,645	\$13,900	\$0	\$13,900	8.4	10,909
Variable Frequency Drive (VFD) Measures		91,474	23.1	0	\$13,730	\$87,647	\$6,285	\$81,362	5.9	92,114
ECM 7	Install VFDs on Constant Volume (CV) Fans	63,612	14.8	0	\$9,548	\$58,048	\$3,960	\$54,088	5.7	64,057
ECM 8	Install VFDs on Heating Water Pumps	19,302	3.7	0	\$2,897	\$19,779	\$0	\$19,779	6.8	19,437
ECM 9	Install Boiler Draft Fan VFDs	8,560	4.6	0	\$1,285	\$9,819	\$2,325	\$7,494	5.8	8,620
HVAC System Improvements		4,490	0.0	65	\$1,272	\$5,438	\$0	\$5,438	4.3	12,172
ECM 12	Implement Demand Control Ventilation (DCV)	4,490	0.0	65	\$1,272	\$5,438	\$0	\$5,438	4.3	12,172
Domestic Water Heating Upgrade		0	0.0	23	\$215	\$100	\$0	\$100	0.5	2,745
ECM 14	Install Low-Flow DHW Devices	0	0.0	23	\$215	\$100	\$0	\$100	0.5	2,745
Food Service & Refrigeration Measures		10,475	1.0	0	\$1,572	\$6,460	\$450	\$6,010	3.8	10,548
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors	917	0.1	0	\$138	\$1,213	\$0	\$1,213	8.8	924
ECM 16	Refrigeration Controls	2,365	0.0	0	\$355	\$3,867	\$200	\$3,667	10.3	2,381
ECM 17	Vending Machine Control	7,193	0.8	0	\$1,080	\$1,380	\$250	\$1,130	1.0	7,243
TOTALS		492,589	146.8	19	\$74,110	\$341,737	\$41,202	\$300,535	4.1	498,245

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

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

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		322,272	112.2	-57	\$47,855	\$174,060	\$28,242	\$145,818	3.0	317,906
ECM 1	Install LED Fixtures	51,603	65.0	0	\$7,745	\$104,223	\$11,200	\$93,023	12.0	51,963
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	2,100	0.7	0	\$311	\$1,408	\$170	\$1,238	4.0	2,063
ECM 3	Retrofit Fixtures with LED Lamps	268,570	46.5	-56	\$39,798	\$68,429	\$16,872	\$51,557	1.3	263,879

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

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

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: field lighting 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: all areas with fluorescent fixtures with T12 tubes.

ECM 3: Retrofit Fixtures with LED Lamps

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

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

Affected building areas: all areas with fluorescent fixtures with T5 or T8 tubes, compact fluorescent, and incandescent lamps.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Control Measures		63,877	10.6	-13	\$9,466	\$68,032	\$6,225	\$61,807	6.5	62,760
ECM 4	Install Occupancy Sensor Lighting Controls	52,774	8.8	-11	\$7,820	\$54,132	\$6,225	\$47,907	6.1	51,851
ECM 5	Install High/Low Lighting Controls	11,103	1.8	-2	\$1,645	\$13,900	\$0	\$13,900	8.4	10,909

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 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, conference rooms, classrooms, 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 requirements. Sensors detect occupancy using ultrasonic

and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low level after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

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

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

Affected building areas: hallways.

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 approach.

4.3 Motors

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Reduction (lbs)
Motor Upgrades		1,010	0.3	0	\$152	\$4,555	\$0	\$4,555	30.0	1,017
ECM 6	Premium Efficiency Motors	1,010	0.3	0	\$152	\$4,555	\$0	\$4,555	30.0	1,017

ECM 6: Premium Efficiency Motors

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

Premium efficiency motors have been proposed to be installed in conjunction with proposed variable frequency drive (VFD) motor measures and for motors which surpassed their useful life of operation. Non-inverter duty rated motors will need to be replaced when the VFD measures are implemented. The cost of the motor replacement associated with VFD measures have been included in ECMs 7, 8 and 9.

Replacing standard efficiency motors with NEMA® premium efficiency motors has a long payback period and may not be justifiable based simply on energy considerations. However, selected motors at this facility are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a premium efficiency motor can be justified by the marginal savings from the improved efficiency. When the heating supply pump and sump pump motors are eventually replaced, consider purchasing motors that exceeds the minimum efficiency required by building codes.

Affected motors summarized on the next page:

Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Additional Motor Description
Boiler Room	Condensate Pumps	2	Condensate Pump	5.0	Condensate Pump motor
Girls Locker Room	HV-2	1	Supply Fan	2.0	HV century AC motor
Boys Locker Room	HV-1	1	Supply Fan	1.5	HV century AC motor
Upper Roof	EF-1	1	Exhaust Fan	1.0	Exhaust fan motor
Upper Roof	EF-3	1	Exhaust Fan	1.0	Exhaust fan motor
Upper Roof	EF-6	1	Exhaust Fan	1.0	Exhaust fan motor

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 Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		91,474	23.1	0	\$13,730	\$87,647	\$6,285	\$81,362	5.9	92,114
ECM 7	Install VFDs on Constant Volume (CV) Fans	63,612	14.8	0	\$9,548	\$58,048	\$3,960	\$54,088	5.7	64,057
ECM 8	Install VFDs on Heating Water Pumps	19,302	3.7	0	\$2,897	\$19,779	\$0	\$19,779	6.8	19,437
ECM 9	Install Boiler Draft Fan VFDs	8,560	4.6	0	\$1,285	\$9,819	\$2,325	\$7,494	5.8	8,620

Variable frequency drives control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor —unless the existing motor meets or exceeds IHP 2014 standards—to conservatively account for the cost of an inverter duty rated motor.

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.

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

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating.

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

Affected air handlers: Supply and return fans for RTU- 1 to 4, Media Center RTU

ECM 8: Install VFDs on Heating Water Pumps

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

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

Affected pumps: HHWP-1 & 2 for both 1965 and 1975 wings

ECM 9: Install Boiler Draft Fan VFDs

Replace existing volume control devices on boiler draft fans, such as inlet vanes or dampers, with VFDs. Inlet vanes or dampers are an inefficient means of controlling the air volume compared to VFDs. The existing volume control device will be removed or permanently disabled, and the control signal will be redirected to the VFD to determine proper fan motor speed.

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

Additional maintenance savings may result from this measure. VFDs are solid state electronic devices, which generally requires less maintenance than mechanical air volume control devices.

Affected fans: Combustion air fans for Boilers 1 & 2

4.5 Electric Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Electric Unitary HVAC Measures		8,981	7.9	0	\$1,348	\$65,490	\$3,071	\$62,419	46.3	9,043
ECM 10	Install High Efficiency Air Conditioning Units	8,981	7.9	0	\$1,348	\$65,490	\$3,071	\$62,419	46.3	9,043

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 ACs and split system ACs are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 10: Install High Efficiency Air Conditioning Units

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

4.6 Gas-Fired Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		0	0.0	1,124	\$10,296	\$344,180	\$0	\$344,180	33.4	131,614
ECM 11	Install High Efficiency Steam Boilers	0	0.0	1,124	\$10,296	\$344,180	\$0	\$344,180	33.4	131,614

ECM 11: Install High Efficiency Steam Boilers

Replace older inefficient steam boilers with high efficiency steam boilers. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

For the purposes of this analysis, we evaluated the replacement of boilers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your mechanical design team to select boilers that are sized appropriately for the heating load at this facility. In many cases installing multiple modular boilers rather than one or two large boilers will result in higher overall plant efficiency while providing additional system redundancy.

Replacing the boilers has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the boilers [are nearing, have reached] the end of their normal useful life. Typically, the marginal cost of purchasing high efficiency boilers can be justified by the marginal savings from the improved efficiency. When the boiler is eventually replaced, consider purchasing boilers that exceed the minimum efficiency required by building codes.

4.7 HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
HVAC System Improvements		4,490	0.0	65	\$1,272	\$5,438	\$0	\$5,438	4.3	12,172
ECM 12	Implement Demand Control Ventilation (DCV)	4,490	0.0	65	\$1,272	\$5,438	\$0	\$5,438	4.3	12,172

ECM 12: Implement Demand Control Ventilation (DCV)

Demand control ventilation (DCV) monitors the indoor air's carbon dioxide (CO₂) content to measure room occupancy. This data is used to regulate the amount of outdoor air provided to the space for ventilation.

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

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

Affected building areas: new and old gym.

4.8 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		0	0.0	116	\$1,061	\$26,158	\$910	\$25,248	23.8	13,557
ECM 13	Install High Efficiency Gas-Fired Water Heater	0	0.0	92	\$846	\$26,057	\$910	\$25,147	29.7	10,812
ECM 14	Install Low-Flow DHW Devices	0	0.0	23	\$215	\$100	\$0	\$100	0.5	2,745

ECM 13: Install High Efficiency Gas-Fired Water Heater

Replace the existing tank water heater with a high efficiency tank water heater. Energy savings result from the increased efficiency of the unit, which uses less gas to heat water, and fewer operating hours to maintain the tank water temperature.

Replacing the water heater has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the water heater has reached the end of their normal useful life. Typically, the marginal cost of purchasing high efficiency water heater can be justified by the marginal savings from the improved efficiency. When the water heater is eventually replaced, consider purchasing a water heater that exceeds the minimum efficiency required by building codes.

ECM 14: 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.

4.9 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		10,475	1.0	0	\$1,572	\$6,460	\$450	\$6,010	3.8	10,548
ECM 15	Refrigerator/Freezer Case Electrically Commutated Motors	917	0.1	0	\$138	\$1,213	\$0	\$1,213	8.8	924
ECM 16	Refrigeration Controls	2,365	0.0	0	\$355	\$3,867	\$200	\$3,667	10.3	2,381
ECM 17	Vending Machine Control	7,193	0.8	0	\$1,080	\$1,380	\$250	\$1,130	1.0	7,243

ECM 15: 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 16: 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 defrosts 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.

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 17: Vending Machine Control

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

5 ENERGY EFFICIENT BEST PRACTICES

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

Energy Tracking with ENERGY STAR® Portfolio Manager®



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

Doors and Windows

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

Window Treatments/Coverings

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

Lighting Controls

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

Motor Controls

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

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

Motor Maintenance

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

Thermostat Schedules and Temperature Resets



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

Economizer Maintenance

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

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

Duct Sealing

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

Steam Trap Repair and Replacement

Steam traps are a crucial part of delivering heat from the boiler to the space heating units. Repair or replace traps that are blocked or allowing steam to pass. Inspect steam traps as part of a regular steam system maintenance plan.

Boiler Maintenance

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

Furnace Maintenance

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

Water Heater Maintenance

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

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

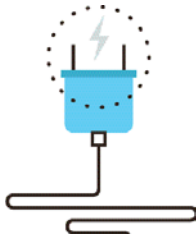
Compressed Air System Maintenance

Compressed air systems require periodic maintenance to operate at peak efficiency. A maintenance plan for compressed air systems should include:

- Inspection, cleaning, and replacement of inlet filter cartridges
- Cleaning of drain traps
- Daily inspection of lubricant levels to reduce unwanted friction
- Inspection of belt condition and tension
- Check for leaks and adjust loose connections
- Overall system cleaning

Contact a qualified technician for help with setting up periodic maintenance schedule.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips⁵. Your local utility may offer incentives or rebates for this equipment.

Computer Monitor Replacement

ENERGY STAR® labeled computer monitors can be up to 25% more efficient than standard monitors. ENERGY STAR® rated monitors have power consumption requirements for different operating modes such as on, idle, and sleep.

Computer Power Management Software

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

Water Conservation



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

For more information regarding water conservation go to the EPA's WaterSense™ website⁶ 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

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

⁶ <https://www.epa.gov/watersense>

⁷ <https://www.epa.gov/watersense/watersense-work-0>

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 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 a PV array.

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

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

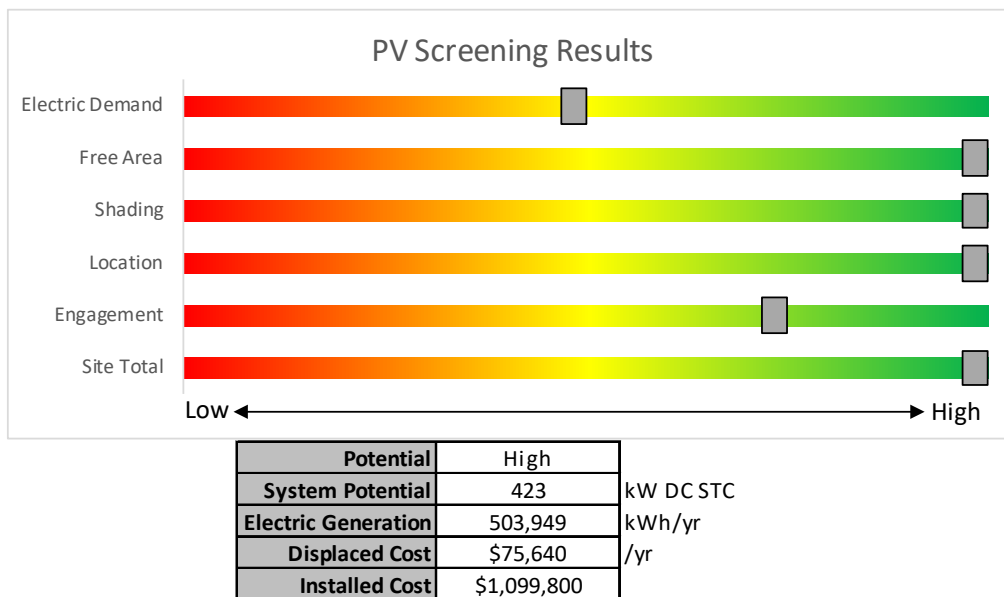


Figure 9 - Photovoltaic Screening

Solar Renewable Energy Credit (SREC) Registration Program

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

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

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

- **Basic Info on Solar PV in 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) generate 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.

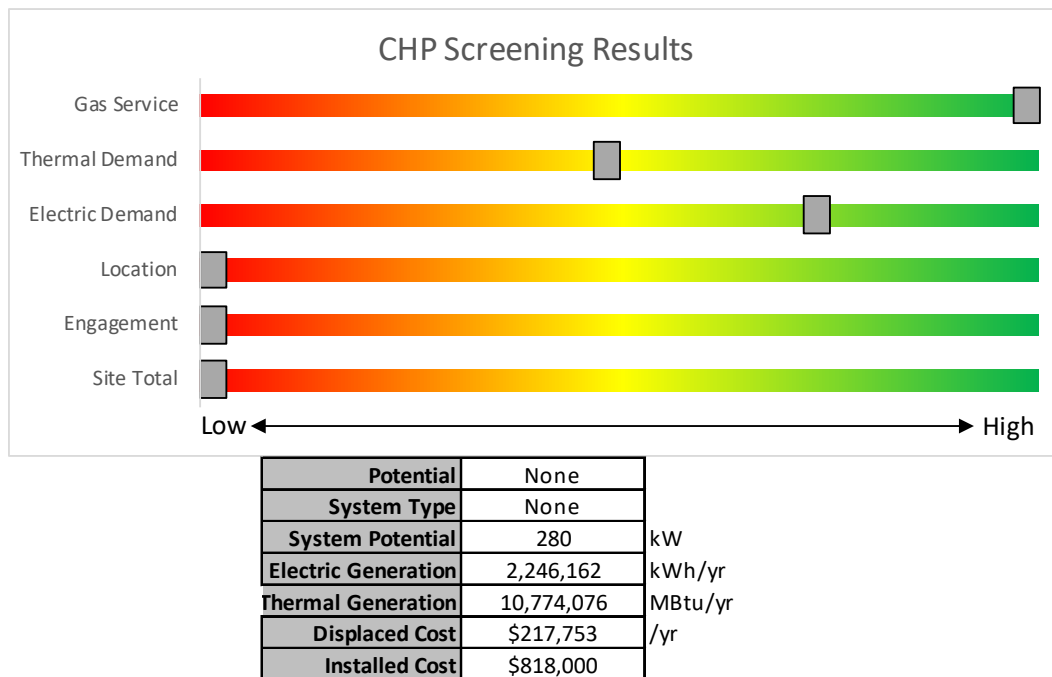


Figure 10 - Combined Heat and Power Screening

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

7 PROJECT FUNDING AND INCENTIVES

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

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

7.1 SmartStart



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

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficiency equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers

Electric Unitary HVAC

Gas Cooling

Gas Heating

Gas Water Heating

Ground Source Heat Pumps

Lighting

Lighting Controls

Refrigeration Doors

Refrigeration Controls

Refrigerator/Freezer Motors

Food Service Equipment

Variable Frequency Drives

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at \$0.16/kWh and \$1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at \$500,000 per electric account and \$500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install



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

installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

Incentives

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

How to Participate

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

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

7.3 Pay for Performance - Existing Buildings



Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15% source energy savings, and lighting cannot make up the majority of the savings. P4P is a generally a good option for medium-to-large sized facilities looking to implement as many

measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

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

Incentives

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

How to Participate

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

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

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

7.4 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	>3 MW	\$350		
Fuel Cells with Heat Recovery				
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

7.5 Energy Savings Improvement Program

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

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

How to Participate

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

- (1) Use an energy services company or "ESCO."
- (2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.
- (3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

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

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

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

7.6 SREC Registration Program

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

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

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

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

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

8 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

8.1 Retail Electric Supply Options

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

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

A list of licensed third-party electric suppliers is available at the NJBPU website⁸.

8.2 Retail Natural Gas Supply Options

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

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

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

A list of licensed third-party natural gas suppliers is available at the NJBPU website⁹.

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

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,131	0.3	2,024	0	\$300	\$493	\$135	1.2
Boiler Room	2	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	26	4,131	3	Relamp	No	2	LED Lamps: Bulb - 1L	Wall Switch	18	4,131	0.0	71	0	\$11	\$34	\$2	3.1
Fire Panel Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,131	0.1	450	0	\$67	\$110	\$30	1.2
Fire Panel Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,131	0.0	300	0	\$44	\$73	\$20	1.2
Fire Panel Room Bathroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	382	0	\$57	\$343	\$20	5.7
Hot water Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,131	0.2	1,350	0	\$200	\$329	\$90	1.2
Hot water Room	1	Compact Fluorescent: Bulb - 1L	Wall Switch	S	60	4,131	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	42	4,131	0.0	82	0	\$12	\$30	\$1	2.4
Custodial Office	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,131	4	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.0	245	0	\$36	\$116	\$20	2.6
Basement Hall	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	S	58	4,131		None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Basement Hall	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,131	5	None	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,850	0.0	245	0	\$36	\$225	\$0	6.2
Basement Hall	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	S	44	4,131		None	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Basement Hall	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,131	5	None	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,850	0.1	327	0	\$48	\$450	\$0	9.3
Stock Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,131	0.0	225	0	\$33	\$55	\$15	1.2
Stock Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	382	0	\$57	\$189	\$40	2.6
Maintenance	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,131	4	None	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	449	0	\$67	\$540	\$70	7.1
Storage Closet	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	200	4	None	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	2	0	\$0	\$116	\$0	395.8
Storage Closet	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	200	4	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.0	4	0	\$1	\$116	\$0	197.9
Maintenance office	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,131	4	None	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.0	204	0	\$30	\$116	\$20	3.2
Basement Hall	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,131	5	None	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,850	0.0	82	0	\$12	\$225	\$0	18.6
Paint Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	200	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	200	0.0	11	0	\$2	\$55	\$15	24.6
Sotar 2	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.2	954	0	\$141	\$453	\$85	2.6
3rd FI Hall	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 5	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,850	0.4	2,480	-1	\$368	\$925	\$130	2.2
3rd FI Custodial	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	13	4,131	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	4,131	0.0	18	0	\$3	\$17	\$1	6.2
Girls 3rd FI	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	45	2,850		None	No	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	45	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Social Study office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	859	0	\$127	\$434	\$80	2.8

		Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis							
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 302	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Classroom 304	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Classroom 305	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Classroom 307	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Custodial Closet	1	Incandescent: Bulb - 1L	Wall Switch	S	60	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	200	0.0	11	0	\$2	\$17	\$1	9.8
Boys 3rd Fl	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
3rd Fl Hall	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 308	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Classroom 306	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.3	1,717	0	\$254	\$599	\$125	1.9
Classroom 303	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,576	-1	\$382	\$763	\$170	1.6
Business Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	859	0	\$127	\$434	\$80	2.8
3rd Fl Closet	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	26	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	18	200	0.0	2	0	\$0	\$17	\$1	63.8
Room 301	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.3	1,717	0	\$254	\$599	\$125	1.9
Art Room 209	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,290	0	\$339	\$708	\$155	1.6
Art Room 207	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.5	3,362	-1	\$498	\$1,270	\$270	2.0
Art Room 207	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	4,131	2	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,131	0.0	268	0	\$40	\$69	\$10	1.5
Art Room 207	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	S	29	4,131		None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Storage Closet	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	26	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	18	200	0.0	2	0	\$0	\$17	\$1	63.8
Classroom 205	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.3	1,717	0	\$254	\$599	\$125	1.9
English Department	10	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	10	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	999	0	\$148	\$723	\$120	4.1
Girls 2nd Fl	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,131	4	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	169	0	\$25	\$270	\$0	10.8
Custodial Closet	1	Incandescent: Bulb - 1L	Wall Switch	S	60	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	200	0.0	11	0	\$2	\$17	\$1	9.8
Classroom 206	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.3	1,717	0	\$254	\$599	\$125	1.9
Classroom 208	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.3	1,717	0	\$254	\$599	\$125	1.9
Classroom 210	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.3	1,717	0	\$254	\$599	\$125	1.9

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 211	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Classroom 212	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,290	0	\$339	\$708	\$155	1.6
Art Room Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.2	1,008	0	\$149	\$489	\$95	2.6
Art Room bathroom	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	60	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	42	200	0.0	4	0	\$1	\$17	\$1	27.6
Boys 2nd Fl	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,131	4	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	169	0	\$25	\$270	\$0	10.8
Boys Closet	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	13	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	200	0.0	1	0	\$0	\$17	\$1	127.6
2nd Fl Hall	34	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	34	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.5	3,398	-1	\$504	\$1,971	\$170	3.6
2nd Fl Hall	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
Classroom 214	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Child Study Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,131	0.0	225	0	\$33	\$55	\$15	1.2
Child Study Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.1	672	0	\$100	\$416	\$75	3.4
Child Study Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Classroom 213	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.4	2,689	-1	\$398	\$854	\$195	1.7
Stair 5	2	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	13	4,131	3	Relamp	No	2	LED Lamps: Bulb - 1L	Wall Switch	9	4,131	0.0	35	0	\$5	\$34	\$2	6.2
Basement Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	200	3,4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	138	0.2	49	0	\$7	\$335	\$60	38.0
Drama Closet	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	200	2,4	Relamp & Reballast	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.1	45	0	\$7	\$322	\$30	44.0
Drama Closet	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	S	176	200	2	Relamp & Reballast	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	200	0.1	26	0	\$4	\$118	\$20	25.6
Band Storage	2	LED Lamps: Bulb - 1L	Wall Switch	S	13	200	4	None	Yes	2	LED Lamps: Bulb - 1L	Occupancy Sensor	13	138	0.0	2	0	\$0	\$116	\$0	441.5
Band Storage	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	13	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	200	0.0	1	0	\$0	\$17	\$1	127.6
Stair 5	1	LED Lamps: Bulb - 2L	Wall Switch	S	26	4,131		None	No	1	LED Lamps: Bulb - 2L	Wall Switch	26	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Stair 5	2	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Wall Switch	S	20	4,131		None	No	2	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Wall Switch	20	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Stair 5	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	15	4,131	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	11	4,131	0.0	20	0	\$3	\$17	\$1	5.4
Stair 5	1	LED Lamps: Bulb - 1L	Wall Switch	S	13	4,131		None	No	1	LED Lamps: Bulb - 1L	Wall Switch	13	4,131	0.0	0	0	\$0	\$0	\$0	0.0
2nd Fl Hidden Hall	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	12	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.2	1,199	0	\$178	\$669	\$60	3.4
2nd Fl Hidden Hall	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

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Art Room 215	21	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,131	3,4	Relamp	Yes	21	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,850	0.3	2,030	0	\$301	\$1,223	\$196	3.4
Kiln Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Art Room 215	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	382	0	\$57	\$189	\$40	2.6
Art Room 215	16	Compact Fluorescent: 4 Pin -2L	Wall Switch	S	64	4,131	3,4	Relamp	Yes	16	LED Lamps: 4 Pin -2L	Occupancy Sensor	45	2,850	0.4	2,406	-1	\$356	\$1,506	\$102	3.9
Classroom 216	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.5	3,434	-1	\$509	\$1,197	\$250	1.9
Classroom 217	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.2	1,526	0	\$226	\$562	\$115	2.0
2nd Fl Hall	25	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	25	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.4	2,499	-1	\$370	\$1,356	\$125	3.3
2nd Fl Hall	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
Elevator	2	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	S	11	4,131		None	No	2	LED - Linear Tubes: (1) 3' Lamp	Wall Switch	11	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Elevator	2	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	S	9	4,131		None	No	2	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Teachers Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.0	7	0	\$1	\$37	\$10	24.6
Computers 218	15	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	15	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,499	0	\$222	\$814	\$145	3.0
Computer Closet	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	200	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	200	0.0	7	0	\$1	\$51	\$5	44.3
Classroom 218A	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	400	0	\$59	\$189	\$40	2.5
Copy 220A	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	400	0	\$59	\$189	\$40	2.5
Room 220	15	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	15	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,499	0	\$222	\$814	\$145	3.0
220 Closet	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	200	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	200	0.0	7	0	\$1	\$51	\$5	44.3
Classroom 222	15	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	15	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,499	0	\$222	\$814	\$145	3.0
Classroom 222	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	4,131	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.0	143	0	\$21	\$51	\$5	2.1
Room 222A	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	400	0	\$59	\$189	\$40	2.5
Room 224A	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	400	0	\$59	\$189	\$40	2.5
Room 224	15	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	15	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,499	0	\$222	\$814	\$145	3.0
Room 224	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	4,131	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.0	143	0	\$21	\$51	\$5	2.1
Room 226	15	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	15	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,499	0	\$222	\$814	\$145	3.0
Room 226	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	4,131	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.0	143	0	\$21	\$51	\$5	2.1

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 226A	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	400	0	\$59	\$189	\$40	2.5
Room 228A	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.2	1,345	0	\$199	\$562	\$115	2.2
Room 228	15	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	15	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,499	0	\$222	\$814	\$145	3.0
Room 228	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	4,131	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.0	143	0	\$21	\$51	\$5	2.1
Custodian 2nd Fl	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.0	200	0	\$30	\$153	\$30	4.1
Boys 2nd Fl	4	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,131	4	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	225	0	\$33	\$270	\$0	8.1
Classroom 231	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,399	0	\$207	\$796	\$140	3.2
Classroom 230	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,399	0	\$207	\$796	\$140	3.2
Classroom 229	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,399	0	\$207	\$796	\$140	3.2
Classroom 227	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,399	0	\$207	\$796	\$140	3.2
Classroom 227A	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	7	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	700	0	\$104	\$398	\$70	3.2
Classroom 225A	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	7	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	700	0	\$104	\$398	\$70	3.2
Classroom 225	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,399	0	\$207	\$796	\$140	3.2
Classroom 223	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,399	0	\$207	\$796	\$140	3.2
Classroom 221	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,399	0	\$207	\$796	\$140	3.2
Classroom 219	14	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	14	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,399	0	\$207	\$796	\$140	3.2
Girls 2nd Fl	4	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,131	4	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	225	0	\$33	\$270	\$0	8.1
2nd Fl Hall	38	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	38	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.6	3,798	-1	\$563	\$2,269	\$190	3.7
2nd Fl Hall	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
Writing Center	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,199	0	\$178	\$759	\$130	3.5
CST Hall	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.1	600	0	\$89	\$335	\$30	3.4
CST Hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0
Learning Consultant Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	400	0	\$59	\$189	\$40	2.5
Psychologist Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	800	0	\$118	\$416	\$75	2.9
Tech Department	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Tech Department	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Tech Department	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.0	300	0	\$44	\$171	\$35	3.1
Tech Department Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	10	0	\$1	\$153	\$10	99.4
Tech Head Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Media Center	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	1.1	6,869	-1	\$1,018	\$2,395	\$500	1.9
Media Center	45	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,131	3,4	Relamp	Yes	45	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,850	0.7	4,349	-1	\$644	\$2,813	\$445	3.7
Media Center	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
Media Center Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Media Center Conference Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,290	0	\$339	\$708	\$155	1.6
MC Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.1	19	0	\$3	\$189	\$20	58.9
AD Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.3	2,017	0	\$299	\$708	\$155	1.9
AD Office Conf Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	400	0	\$59	\$189	\$40	2.5
Room 204	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,290	0	\$339	\$708	\$155	1.6
Classroom 203	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.5	3,434	-1	\$509	\$1,197	\$250	1.9
Classroom 202	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.5	3,434	-1	\$509	\$1,197	\$250	1.9
Classroom 201	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,290	0	\$339	\$708	\$155	1.6
2nd Fl Hall	32	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	32	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.5	3,198	-1	\$474	\$1,934	\$160	3.7
2nd Fl Hall	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
Stair 21	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,131	0.1	600	0	\$89	\$146	\$40	1.2
Stair 21	1	Incandescent: Bulb - 1L	Wall Switch	S	60	4,131	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	4,131	0.0	232	0	\$34	\$17	\$1	0.5
Staff Room	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Staff Room	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Staff Bathroom	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Wall Switch	S	20	200		None	No	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Wall Switch	20	200	0.0	0	0	\$0	\$0	\$0	0.0
Staff Restroom	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,131		None	No	1	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	40	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Classroom 100	10	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	10	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
100 Closet	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	200		None	No	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	200	0.0	0	0	\$0	\$0	\$0	0.0
100 Storage	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	S	15	200		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	200	0.0	0	0	\$0	\$0	\$0	0.0
Nurse	5	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	5	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Nurse Closet	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	200		None	No	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	200	0.0	0	0	\$0	\$0	\$0	0.0
Nurse	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Nurse Bathroom	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Nurse Office	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Girls 1st Fl	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	572	0	\$85	\$380	\$30	4.1
Custodial Closet	1	LED Lamps: Bulb - 1L	Wall Switch	S	13	200		None	No	1	LED Lamps: Bulb - 1L	Wall Switch	13	200	0.0	0	0	\$0	\$0	\$0	0.0
Supervisor Office	6	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	6	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Supervisor Bathroom	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	1	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 1	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 2	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 3	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 4	3	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	3	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 5	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 6	3	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	3	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 7	3	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	3	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Classroom 101	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Classroom 102	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.5	3,148	-1	\$466	\$1,142	\$235	1.9
Custodial Closet	1	LED Lamps: Bulb - 1L	Wall Switch	S	9	200		None	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	200	0.0	0	0	\$0	\$0	\$0	0.0
Boys 1st Fl	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	859	0	\$127	\$434	\$45	3.1
Main Office	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	12	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Main Office	4	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	4	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Main Office Closet	1	LED - Linear Tubes: (1) 4' Lamp	Daylight Dimming	S	15	200		None	No	1	LED - Linear Tubes: (1) 4' Lamp	Daylight Dimming	15	200	0.0	0	0	\$0	\$0	\$0	0.0

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
VP Office	6	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	6	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Principal Office	8	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	8	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Vestibule 1	3	LED - Fixtures: Decorative Pendant	Wall Switch	S	25	4,131	4	None	Yes	3	LED - Fixtures: Decorative Pendant	Occupancy Sensor	25	2,850	0.0	106	0	\$16	\$116	\$20	6.1
Case Light	8	LED Lamps: Small Lamp - 1L	None		7	4,131		None	No	8	LED Lamps: Small Lamp - 1L	None	7	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Conference Room	8	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	20	2,850		None	No	8	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	20	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Guidance Office	11	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	11	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Guidance Director	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 1	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 2	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 3	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Office 4	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	S	40	2,850		None	No	2	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	0	0	\$0	\$0	\$0	0.0
Closet	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	S	40	200		None	No	1	LED - Fixtures: Ambient - 2' - Direct/Indirect Fixture	Occupancy Sensor	40	200	0.0	0	0	\$0	\$0	\$0	0.0
Guidance Office	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
1st Fl Hall	23	LED Lamps: Bulb - 4L	Wall Switch	S	52	4,131	5	None	Yes	23	LED Lamps: Bulb - 4L	High/Low Control	52	2,850	0.3	1,685	0	\$250	\$900	\$0	3.6
Old Gym	24	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Occupancy Sensor	S	120	2,850	3	Relamp	No	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	1.1	4,665	-1	\$691	\$1,753	\$480	1.8
Old Gym	2	Halogen Incandescent: Bulb - 1L	Wall Switch	S	100	4,131	3, 4	Relamp	Yes	2	LED Lamps: Bulb - 1L	Occupancy Sensor	15	2,850	0.1	815	0	\$121	\$330	\$37	2.4
Old Gym	3	LED Lamps: Lamp Fixture	None		21	4,131		None	No	3	LED Lamps: Lamp Fixture	None	21	4,131	0.0	0	0	\$0	\$0	\$0	0.0
Gym Storage	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	26	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	18	200	0.0	2	0	\$0	\$17	\$1	63.8
Trainer's Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Football Coach Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	572	0	\$85	\$380	\$65	3.7
FCO Bathroom	1	LED Lamps: Bulb - 1L	Wall Switch	S	13	200		None	No	1	LED Lamps: Bulb - 1L	Wall Switch	13	200	0.0	0	0	\$0	\$0	\$0	0.0
Old 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
Vestibule 8	2	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	42	4,131	3, 4	Relamp	Yes	2	LED Lamps: Bulb - 1L	Occupancy Sensor	29	2,850	0.0	197	0	\$29	\$150	\$22	4.4
Custodial Closet	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	26	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	18	200	0.0	2	0	\$0	\$17	\$1	63.8
Storage Closet	1	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	26	200	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	18	200	0.0	2	0	\$0	\$17	\$1	63.8

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Storages	2	Incandescent: Bulb - 1L	Wall Switch	S	60	200	3, 4	Relamp	Yes	2	LED Lamps: Bulb - 1L	Occupancy Sensor	9	138	0.1	24	0	\$4	\$150	\$2	42.3
Gym Closet	2	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	200	2, 4	Relamp & Reballast	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.1	16	0	\$2	\$217	\$10	88.2
New Gym	24	Linear Fluorescent - T5HO: 4' T5HO (54W) - 6L	Occupancy Sensor	S	358	2,850	3	Relamp	No	24	LED - Linear Tubes: (6) 4' T5HO (25W) Lamps	Occupancy Sensor	153	2,850	3.5	15,425	-3	\$2,286	\$2,980	\$0	1.3
Gym Storage	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3, 4	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.1	39	0	\$6	\$262	\$40	38.7
Gym Storage	5	Exit Signs: LED - 2 W Lamp	None		6	200		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	200	0.0	0	0	\$0	\$0	\$0	0.0
Gym Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3, 4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.1	19	0	\$3	\$189	\$20	58.9
Gym Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	32	200	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	10	0	\$1	\$153	\$10	99.4
Security Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	763	0	\$113	\$416	\$75	3.0
Drug Counseling	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	763	0	\$113	\$416	\$75	3.0
Storage Closet	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	200	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	200	0.0	7	0	\$1	\$51	\$5	44.3
Security Hall	3	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,131	3, 5	Relamp	Yes	3	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,850	0.1	483	0	\$72	\$371	\$27	4.8
Boys 1st Fl	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	382	0	\$57	\$343	\$20	5.7
Boys 1st Fl	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,131	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,131	0.0	73	0	\$11	\$33	\$6	2.5
Girls 1st Fl	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	382	0	\$57	\$343	\$20	5.7
Girls 1st Fl	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,131	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,131	0.0	73	0	\$11	\$33	\$6	2.5
New Gym Hall	16	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3, 5	Relamp	Yes	16	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,850	0.9	5,378	-1	\$797	\$1,568	\$320	1.6
New Gym Hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0
Girls Locker Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,131	3	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,131	0.0	125	0	\$19	\$49	\$9	2.1
Girls Locker Room	33	Compact Fluorescent: Lamp Fixture	Wall Switch	S	18	4,131	3, 4	Relamp	Yes	33	LED Lamps: LED Lamp	Occupancy Sensor	13	2,850	0.2	1,395	0	\$207	\$1,648	\$173	7.1
Girls Locker Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3, 4	Relamp	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.4	2,689	-1	\$398	\$854	\$195	1.7
Girls Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	15	0	\$2	\$171	\$15	72.4
Girls Coach Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	572	0	\$85	\$380	\$65	3.7
GCO Bathroom	1	Compact Fluorescent: Lamp Fixture	Wall Switch	S	18	200	3	Relamp	No	1	LED Lamps: LED Lamp	Wall Switch	13	200	0.0	1	0	\$0	\$17	\$1	92.2
Girls Locker	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
Girls Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	200	0.0	4	0	\$1	\$18	\$5	23.2

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Stair 14	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,131	0.3	2,099	0	\$311	\$511	\$140	1.2
Stair 14	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
Tennis Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	10	0	\$1	\$153	\$10	99.4
Volleyball Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	10	0	\$1	\$153	\$10	99.4
Stair 14	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,131	0.0	150	0	\$22	\$37	\$10	1.2
Stair 14	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.0	159	0	\$24	\$37	\$10	1.1
Hot Room	3	LED Lamps: Bulb - 1L	Wall Switch	S	13	4,131	4	None	Yes	3	LED Lamps: Bulb - 1L	Occupancy Sensor	13	2,850	0.0	55	0	\$8	\$116	\$20	11.8
Weight Room	30	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3	Relamp	No	30	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.4	2,386	0	\$353	\$548	\$150	1.1
Weight Room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0
Cycle Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.3	1,908	0	\$283	\$905	\$170	2.6
Cycle Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	400	0	\$59	\$189	\$40	2.5
Weight Room Hall	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,5	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,850	0.1	572	0	\$85	\$335	\$30	3.6
Boys Locker	24	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	24	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.4	2,399	-1	\$355	\$978	\$190	2.2
Boys Locker	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
Boys Locker	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	S	53	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	2,850	0.1	322	0	\$48	\$368	\$18	7.3
Boys Locker	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.0	80	0	\$12	\$18	\$5	1.1
Boys Locker	4	Compact Fluorescent: Lamp Fixture	Wall Switch	S	18	4,131	3,4	Relamp	Yes	4	LED Lamps: LED Lamp	Occupancy Sensor	13	2,850	0.0	169	0	\$25	\$339	\$4	13.4
Boys Coach Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Coach Locker	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,131	0.0	254	0	\$38	\$73	\$20	1.4
Coach Bathroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	S	22	200	3	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	200	0.0	3	0	\$0	\$16	\$3	30.1
Team Room	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,299	0	\$193	\$777	\$135	3.3
Wrestling Closet	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3,4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	15	0	\$2	\$171	\$15	72.4
Gym Connection Hall	5	LED - Fixtures: Wall Sconces	Wall Switch	S	17	4,131	5	None	Yes	5	LED - Fixtures: Wall Sconces	High/Low Control	17	2,850	0.0	120	0	\$18	\$225	\$0	12.7
Gym Connection Hall	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0
Softball Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.1	18	0	\$3	\$189	\$20	61.7

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Track Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.0	7	0	\$1	\$37	\$10	24.6
Track Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	200	0.0	4	0	\$1	\$18	\$5	23.2
Football Storage	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	138	0.0	9	0	\$1	\$181	\$12	121.9
Old Gym Deck	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.2	1,008	0	\$149	\$489	\$95	2.6
Cafeteria	27	LED - Fixtures: Ambient - 8' - Direct Fixture	Daylight Dimming	S	17	2,478		None	No	27	LED - Fixtures: Ambient - 8' - Direct Fixture	Daylight Dimming	17	2,478	0.0	0	0	\$0	\$0	\$0	0.0
Cafeteria	30	LED - Fixtures: Ambient - 4' - Direct Fixture	Daylight Dimming	S	15	2,478		None	No	30	LED - Fixtures: Ambient - 4' - Direct Fixture	Daylight Dimming	15	2,478	0.0	0	0	\$0	\$0	\$0	0.0
Cafeteria Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.1	18	0	\$3	\$189	\$20	61.7
Cafeteria Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	10	0	\$1	\$153	\$10	99.4
Cafeteria	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
Cafeteria	13	LED - Fixtures: Ceiling Mount	Daylight Dimming	S	17	2,478		None	No	13	LED - Fixtures: Ceiling Mount	Daylight Dimming	17	2,478	0.0	0	0	\$0	\$0	\$0	0.0
Teachers Dine	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.5	3,362	-1	\$498	\$1,270	\$270	2.0
Kitchen	17	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,4	Relamp	Yes	17	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.3	1,699	0	\$252	\$850	\$155	2.8
Kitchen Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3,4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	15	0	\$2	\$171	\$15	72.4
Kitchen Custodial	2	LED - Fixtures: Ceiling Mount	Wall Switch	S	18	4,131	4	None	Yes	2	LED - Fixtures: Ceiling Mount	Occupancy Sensor	18	2,850	0.0	51	0	\$8	\$116	\$20	12.8
Kitchen Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.0	7	0	\$1	\$37	\$10	24.6
Kitchen Hall	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.0	200	0	\$30	\$262	\$10	8.5
Kitchen Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	0.1	672	0	\$100	\$416	\$75	3.4
Kitchen Storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3,4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.2	46	0	\$7	\$299	\$50	36.3
Trophy Case	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	4,131	2	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,131	0.0	268	0	\$40	\$69	\$10	1.5
Kitchen Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	200	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	200	0.0	12	0	\$2	\$73	\$20	29.0
1st Fl Hall Gym side	28	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	28	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.4	2,798	-1	\$415	\$1,636	\$140	3.6
Room 117	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,576	-1	\$382	\$763	\$170	1.6
Room 116	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,290	0	\$339	\$708	\$155	1.6
Room 115	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,576	-1	\$382	\$763	\$170	1.6
Custodial Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	138	0.1	33	0	\$5	\$262	\$40	46.0

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lecture Hall	16	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3, 5	Relamp	Yes	16	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	2,850	0.9	5,378	-1	\$797	\$1,618	\$320	1.6
Lecture Hall	15	Incandescent: High Hats Cane Fixture	Wall Switch	S	150	4,131	3, 5	Relamp	Yes	15	LED Lamps: High Hat Cane Bulb	High/Low Control	23	2,850	1.5	9,165	-2	\$1,358	\$828	\$15	0.6
Lecture Hall	2	Compact Fluorescent: Spiral Bulb - 1L	Wall Switch	S	18	4,131	3, 5	Relamp	Yes	2	LED Lamps: Bulb - 1L	High/Low Control	13	2,850	0.0	85	0	\$13	\$259	\$2	20.5
Chorus Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3, 4	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	500	0	\$74	\$207	\$45	2.2
Lecture Hall	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
Stair 11	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3	Relamp	No	7	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.1	557	0	\$82	\$128	\$35	1.1
Stair 11	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,131	0.0	254	0	\$38	\$73	\$20	1.4
Boys 1st FL	3	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,131	4	None	Yes	3	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	169	0	\$25	\$270	\$0	10.8
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.0	7	0	\$1	\$37	\$10	24.6
Science Office	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3, 4	Relamp	Yes	7	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	700	0	\$104	\$398	\$70	3.2
Classroom 114	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.9	5,724	-1	\$848	\$1,635	\$370	1.5
Set up room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Set up room	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,850	0.1	357	0	\$53	\$261	\$40	4.2
Animal Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Classroom 112	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.9	5,724	-1	\$848	\$1,635	\$370	1.5
112 Science Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.3	1,717	0	\$254	\$599	\$125	1.9
112 Science Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Classroom 110	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.9	5,724	-1	\$848	\$1,635	\$370	1.5
Classroom 110	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3, 4	Relamp	Yes	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,199	0	\$178	\$759	\$130	3.5
110 Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
110 Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	200	3, 4	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	138	0.3	83	0	\$12	\$445	\$90	28.8
Classroom 108	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.7	4,579	-1	\$679	\$1,416	\$310	1.6
Classroom 108	4	Compact Fluorescent: 4 Pin -2L	Wall Switch	S	42	4,131	3, 4	Relamp	Yes	4	LED Lamps: 4 Pin -2L	Occupancy Sensor	29	2,850	0.1	395	0	\$58	\$357	\$28	5.6
Classroom 108	12	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3, 4	Relamp	Yes	12	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.2	1,199	0	\$178	\$759	\$130	3.5
Girls 1st FL	4	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	S	40	4,131	4	None	Yes	4	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	2,850	0.0	225	0	\$33	\$270	\$0	8.1

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 109	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.9	5,724	-1	\$848	\$1,635	\$370	1.5
Prep Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Chemical Storage	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	200	0.1	29	0	\$4	\$146	\$40	24.6
Classroom 111	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.9	5,724	-1	\$848	\$1,635	\$370	1.5
Prep Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.2	1,145	0	\$170	\$489	\$95	2.3
Prep Room	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,131	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,131	0.0	73	0	\$11	\$33	\$6	2.5
Prep Room Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3,4	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Classroom 113	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.9	5,724	-1	\$848	\$1,635	\$370	1.5
1st Fl Hall by Lecture Hall	36	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3,5	Relamp	Yes	36	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.6	3,598	-1	\$533	\$2,007	\$180	3.4
Stair 10	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,131	0.0	254	0	\$38	\$73	\$20	1.4
Stair 10	7	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3	Relamp	No	7	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.1	557	0	\$82	\$128	\$35	1.1
Annex	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.8	4,865	-1	\$721	\$1,471	\$325	1.6
Annex Men	1	Incandescent: Bulb - 1L	Wall Switch	S	60	4,131	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	4,131	0.0	232	0	\$34	\$17	\$1	0.5
Annex Women	1	Incandescent: Bulb - 1L	Wall Switch	S	60	4,131	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	9	4,131	0.0	232	0	\$34	\$17	\$1	0.5
Classroom 106	28	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3,4	Relamp	Yes	28	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	1.5	9,412	-2	\$1,395	\$2,855	\$665	1.6
106 Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3,4	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.2	55	0	\$8	\$335	\$60	33.5
106 Storage 2	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	S	88	200	2,4	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.1	30	0	\$4	\$254	\$20	52.7
116 Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.1	572	0	\$85	\$380	\$65	3.7
Elevator Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3	Relamp	No	6	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.1	477	0	\$71	\$110	\$30	1.1
Photolab 107	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3	Relamp	No	11	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,131	0.4	2,799	-1	\$415	\$803	\$220	1.4
Dark Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,131	0.2	1,350	0	\$200	\$329	\$90	1.2
107 Storage	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	200	2	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	200	0.0	7	0	\$1	\$51	\$5	44.3
Custodial Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	138	0.1	33	0	\$5	\$262	\$40	46.0
Classroom 105	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3,4	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.7	4,293	-1	\$636	\$1,362	\$295	1.7
105 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3,4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.1	18	0	\$3	\$189	\$20	61.7

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
105 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	200	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	138	0.1	18	0	\$3	\$189	\$20	61.7
Classroom 103	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,131	3, 4	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,850	0.4	2,576	-1	\$382	\$763	\$170	1.6
Auditorium	12	Incandescent: High Hats Cane Fixture	Daylight Dimming	S	200	2,478	3	Relamp	No	12	LED Lamps: High Hat Cane Bulb	Daylight Dimming	30	2,478	1.5	5,562	-1	\$824	\$303	\$12	0.4
Auditorium	13	LED Lamps: Bulb - 4L	Daylight Dimming	S	52	2,478		None	No	13	LED Lamps: Bulb - 4L	Daylight Dimming	52	2,478	0.0	0	0	\$0	\$0	\$0	0.0
Auditorium	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
Auditorium	5	LED Lamps: Bulb - 1L	Wall Switch	S	13	4,131	4	None	Yes	5	LED Lamps: Bulb - 1L	Occupancy Sensor	13	2,850	0.0	92	0	\$14	\$116	\$20	7.1
Auditorium	2	LED Lamps: Bulb - 2L	Wall Switch	S	26	4,131	4	None	Yes	2	LED Lamps: Bulb - 2L	Occupancy Sensor	26	2,850	0.0	73	0	\$11	\$116	\$20	8.8
Light Room	1	Compact Fluorescent: Bulb - 1L	Wall Switch	S	20	4,131	3	Relamp	No	1	LED Lamps: Bulb - 1L	Wall Switch	14	4,131	0.0	27	0	\$4	\$17	\$1	4.0
Stage	4	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	S	120	4,131	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,131	0.2	1,127	0	\$167	\$292	\$80	1.3
Storage	1	LED Lamps: Bulb - 1L	Wall Switch	S	13	200		None	No	1	LED Lamps: Bulb - 1L	Wall Switch	13	200	0.0	0	0	\$0	\$0	\$0	0.0
Band Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	763	0	\$113	\$416	\$75	3.0
Band Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3, 4	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	500	0	\$74	\$207	\$45	2.2
Band Room	22	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,131	3, 4	Relamp	Yes	22	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,850	1.2	7,395	-2	\$1,096	\$2,417	\$545	1.7
Band Room	2	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	S	63	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	2,850	0.1	359	0	\$53	\$246	\$44	3.8
Band Room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	\$0	\$0	\$0	0.0
Band Room Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3, 4	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.0	15	0	\$2	\$171	\$15	72.4
1st Fl Hall by Band Room	20	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3, 5	Relamp	Yes	20	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,850	0.3	1,999	0	\$296	\$1,265	\$100	3.9
104 Woodshop	46	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3	Relamp	No	46	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,131	1.1	6,898	-1	\$1,022	\$1,680	\$460	1.2
104 Woodshop	6	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	S	46	4,131	2	Relamp & Reballast	No	6	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,131	0.1	859	0	\$127	\$303	\$30	2.1
104 Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	4,131	3, 4	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,850	0.1	600	0	\$89	\$380	\$65	3.5
Paint Room	4	Incandescent: Big Bulb - 1L	Wall Switch	S	150	4,131	3, 4	Relamp	Yes	4	LED Lamps: Bulb - 1L	Occupancy Sensor	23	2,850	0.4	2,444	-1	\$362	\$411	\$39	1.0
Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	200	3, 4	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	138	0.1	29	0	\$4	\$226	\$30	45.5
Wood Showcase	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,131	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,850	0.1	382	0	\$57	\$189	\$40	2.6
Pole Mounted Field Lights	84	Metal Halide: (1) 1500W Lamp	Breaker Panel		1,610	397	1	Fixture Replacement	No	84	LED - Fixtures: Outdoor Pole/Arm Mounted Area/Roadway Fixture	Breaker Panel	450	397	48.7	38,702	0	\$5,809	\$78,167	\$8,400	12.0
New Pole Mounted Field Lights	28	Metal Halide: (1) 1500W Lamp	Breaker Panel		1,610	397	1	Fixture Replacement	No	28	LED - Fixtures: Outdoor Pole/Arm Mounted Area/Roadway Fixture	Breaker Panel	450	397	16.2	12,901	0	\$1,936	\$26,056	\$2,800	12.0

Location	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis								
	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
School Exterior	8	LED - Fixtures: Architectural Flood/Spot Luminaire	Other		57	3,080		None	No	8	LED - Fixtures: Architectural Flood/Spot Luminaire	Other	57	3,080	0.0	0	0	\$0	\$0	\$0	0.0
School Exterior	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Other		44	3,080		None	No	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Other	44	3,080	0.0	0	0	\$0	\$0	\$0	0.0
School Exterior wallpack	1	LED - Fixtures: Outdoor Porch Wall Mount	Other		20	3,080		None	No	1	LED - Fixtures: Outdoor Porch Wall Mount	Other	20	3,080	0.0	0	0	\$0	\$0	\$0	0.0
School Exterior	7	LED - Fixtures: Emergency Light	None		6	4,131		None	No	7	LED - Fixtures: Emergency Light	None	6	4,131	0.0	0	0	\$0	\$0	\$0	0.0
School Exterior	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Other		37	3,080		None	No	2	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Other	37	3,080	0.0	0	0	\$0	\$0	\$0	0.0
School Exterior	7	Compact Fluorescent: Decorative Pendant	Other		42	3,080	3	Relamp	No	7	LED Lamps: Decorative Pendant Bulb	Other	29	3,080	0.0	272	0	\$41	\$181	\$7	4.3
School Exterior	6	LED - Fixtures: Outdoor Pole/Arm Mounted Area/Roadway Fixture	Other		13	3,080		None	No	6	LED - Fixtures: Outdoor Pole/Arm Mounted Area/Roadway Fixture	Other	13	3,080	0.0	0	0	\$0	\$0	\$0	0.0
School Exterior	3	LED - Fixtures: Outdoor Post-Mount	Other		13	3,080		None	No	3	LED - Fixtures: Outdoor Post-Mount	Other	13	3,080	0.0	0	0	\$0	\$0	\$0	0.0
School Exterior Wall	2	LED - Fixtures: Decorative Pendant	Other		13	3,080		None	No	2	LED - Fixtures: Decorative Pendant	Other	13	3,080	0.0	0	0	\$0	\$0	\$0	0.0
Courtyard	4	LED - Fixtures: Ceiling Mount	Other		13	3,080		None	No	4	LED - Fixtures: Ceiling Mount	Other	13	3,080	0.0	0	0	\$0	\$0	\$0	0.0

Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions					Energy Impact & Financial Analysis						
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Boiler 1	1	Combustion Air Fan	7.5	86.5%	No	W	1,696	9	No	88.5%	Yes	1	2.3	4,280	0	\$642	\$4,909	\$1,163	5.8
Boiler Room	Boiler 2	1	Combustion Air Fan	7.5	86.5%	No	W	1,696	9	No	88.5%	Yes	1	2.3	4,280	0	\$642	\$4,909	\$1,163	5.8
Boiler Room	Sump Pump	2	Process Pump	0.8	60.0%	No	W	1,373		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Boiler Room	Condensate Pumps	2	Condensate Pump	5.0	85.5%	No	B	1,696	6	Yes	89.5%	No		0.2	496	0	\$74	\$1,842	\$0	24.7
Boiler Room	Vacuum Pump	2	Process Pump	5.0	84.0%	No	W	1,696		No	84.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Boiler Room	Boiler Pumps	3	Other	1.0	78.0%	No	W	1,696		No	78.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Boiler Room	Air Compressor	2	Air Compressor	3.0	81.5%	No	W	3,489		No	81.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Boiler Room	HHWP-1 75 Wing	1	Heating Hot Water Pump	10.0	91.7%	No	W	1,696	8	No	91.7%	Yes	1	1.0	5,172	0	\$776	\$5,152	\$0	6.6
Boiler Room	HHWP-2 75 Wing	1	Heating Hot Water Pump	7.5	86.5%	No	W	1,696	8	No	91.0%	Yes	1	0.9	4,479	0	\$672	\$4,738	\$0	7.0
Boiler Room	HHWP-1 65 Wing	1	Heating Hot Water Pump	10.0	91.7%	No	W	1,696	8	No	91.7%	Yes	1	1.0	5,172	0	\$776	\$5,152	\$0	6.6
Boiler Room	HHWP-2 65 Wing	1	Heating Hot Water Pump	7.5	86.5%	No	W	1,696	8	No	91.0%	Yes	1	0.9	4,479	0	\$672	\$4,738	\$0	7.0
Classrooms	Unit Ventilators	10	Supply Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Girls Locker Room	HV-2	1	Supply Fan	2.0	84.0%	No	W	3,706	6	Yes	86.5%	No		0.0	143	0	\$21	\$532	\$0	24.8
Boys Locker Room	HV-1	1	Supply Fan	1.5	84.0%	No	W	3,706	6	Yes	86.5%	No		0.0	107	0	\$16	\$758	\$0	47.2
Kitchen	DHW Recirculation Pump	1	Water Supply Pump	0.2	60.0%	No	W	8,760		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Woodshop	Jet Collector	1	Process Blower	3.0	87.5%	No	W	915		No	87.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Woodshop	Wood Sanding Machine	1	Process Blower	1.5	84.0%	No	W	915		No	84.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Woodshop	Drilling Machine	2	Process Blower	2.0	84.0%	No	W	915		No	84.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Woodshop	Edge Sanding Machine	1	Process Blower	1.5	84.0%	No	W	915		No	84.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Woodshop	Drill Press	1	Other	0.8	60.0%	No	W	915		No	60.0%	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?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Woodshop	Table Saw	1	Other	1.8	86.5%	No	W	915		No	86.5%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-4	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	EF 1-2	1	Exhaust Fan	0.5	76.2%	No	W	3,706		No	76.2%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-15	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Packaged AC	1	Supply Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Packaged AC	1	Supply Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	EF-1	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-1	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-2	1	Exhaust Fan	0.8	68.0%	No	W	3,706		No	68.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-3	1	Exhaust Fan	0.8	68.0%	No	W	3,706		No	68.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-5	1	Exhaust Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-6	1	Exhaust Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-13	1	Exhaust Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-14	1	Exhaust Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-16	1	Exhaust Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-17	1	Exhaust Fan	0.8	68.0%	No	W	3,706		No	68.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Exhaust Fan	1	Exhaust Fan	0.1	60.0%	No	B	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Exhaust Fan	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Media Center Unit	1	Supply Fan	7.5	89.5%	No	W	4,578	7	No	91.7%	Yes	1	2.2	11,195	0	\$1,680	\$4,761	\$600	2.5
Upper Roof	RV-8	1	Exhaust Fan	0.8	68.0%	No	W	3,706		No	68.0%	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?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Upper Roof	RE-1	1	Exhaust Fan	0.8	68.0%	No	W	3,706		No	68.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-9	1	Exhaust Fan	0.3	68.0%	No	W	3,706		No	68.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-18	1	Exhaust Fan	0.8	68.0%	No	W	3,706		No	68.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-10	1	Exhaust Fan	0.8	68.0%	No	W	3,706		No	68.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	EF 1-2	1	Exhaust Fan	0.5	76.2%	No	W	3,706		No	76.2%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-11	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-12	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	EF-1	1	Exhaust Fan	1.0	82.5%	No	W	3,706	6	Yes	85.5%	No		0.0	88	0	\$13	\$474	\$0	35.8
Upper Roof	RV-4	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	RV-1	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	New Gym RTU-1	2	Supply Fan	5.0	87.5%	No	W	3,706	7	No	89.5%	Yes	2	3.0	12,324	0	\$1,850	\$9,011	\$800	4.4
Upper Roof	New Gym RTU-1	2	Return Fan	2.0	86.5%	No	W	3,706	7	No	88.5%	Yes	2	1.2	4,989	0	\$749	\$6,987	\$320	8.9
Upper Roof	New Gym RTU-2	2	Supply Fan	5.0	87.5%	No	W	3,706	7	No	89.5%	Yes	2	3.0	12,324	0	\$1,850	\$9,011	\$800	4.4
Upper Roof	New Gym RTU-2	2	Return Fan	2.0	86.5%	No	W	3,706	7	No	88.5%	Yes	2	1.2	4,989	0	\$749	\$6,987	\$320	8.9
Upper Roof	Old Gym RTU-3	1	Supply Fan	5.0	87.5%	No	W	3,706	7	No	89.5%	Yes	1	1.5	6,162	0	\$925	\$4,197	\$400	4.1
Upper Roof	Old Gym RTU-3	2	Return Fan	1.0	80.0%	No	W	3,706	7	No	82.5%	Yes	2	0.6	2,733	0	\$410	\$6,449	\$160	15.3
Upper Roof	Old Gym RTU-4	1	Supply Fan	5.0	87.5%	No	W	3,706	7	No	89.5%	Yes	1	1.5	6,162	0	\$925	\$4,197	\$400	4.1
Upper Roof	Old Gym RTU-4	2	Return Fan	1.0	80.0%	No	W	3,706	7	No	82.5%	Yes	2	0.6	2,733	0	\$410	\$6,449	\$160	15.3
Upper Roof	EF-3	1	Exhaust Fan	1.0	82.5%	No	W	3,706	6	Yes	85.5%	No		0.0	88	0	\$13	\$474	\$0	35.8
Upper Roof	EF-6	1	Exhaust Fan	1.0	82.5%	No	W	3,706	6	Yes	85.5%	No		0.0	88	0	\$13	\$474	\$0	35.8

Location	Area(s)/System(s) Served	Existing Conditions							Proposed Conditions				Energy Impact & Financial Analysis							
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Upper Roof	EF-1	1	Exhaust Fan	0.1	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Classrooms	201,202,203,204, 216 and 217	6	Supply Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0
Classrooms	201,202,203,204, 216 and 217	6	Exhaust Fan	0.3	60.0%	No	W	3,706		No	60.0%	No		0.0	0	0	\$0	\$0	\$0	0.0

Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions						Proposed Conditions						Energy Impact & Financial Analysis						
		System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives
Upper Roof	Classrooms	3	Split-System Air-Source HP	6.00	81.00	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Split-System AC	0.75		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Split-System AC	2.50		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Packaged AC	4.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Packaged AC	2.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	2	Split-System AC	60.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	IDF Room	1	Split-System Air-Source HP	1.50	16.40	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	4	Packaged AC	4.00		W	10	Yes	4	Packaged AC	4.00		14.00	2.7	3,138	0	\$471	\$36,303	\$1,472	74.0
Upper Roof	Classrooms	1	Split-System AC	3.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Split-System AC	2.50		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Packaged AC	15.00		B	10	Yes	1	Packaged AC	15.00		11.50	3.9	4,418	0	\$663	\$20,908	\$1,185	29.7
Upper Roof	Classrooms	2	Split-System Air-Source HP	2.50	32.00	W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Split-System AC	3.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Media Center RTU-1	1	Packaged AC	20.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Split-System AC	0.81		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Packaged AC	2.00		W	10	Yes	1	Packaged AC	2.00		14.00	0.3	392	0	\$59	\$4,538	\$184	74.0
Upper Roof	New Gym RTU-1	1	Packaged AC	50.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	New Gym RTU-2	1	Packaged AC	50.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Old Gym RTU-3	1	Packaged AC	20.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Old Gym RTU-4	1	Packaged AC	20.00		W		No						0.0	0	0	\$0	\$0	\$0	0.0

		Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lower Roof	Classrooms	1	Split-System AC	2.50		B	10	Yes	1	Split-System AC	2.50		14.00		0.9	1,032	0	\$155	\$3,741	\$230	22.7
Lower Roof	Classrooms	1	Split-System Air-Source HP	1.50	22.00	W		No							0.0	0	0	\$0	\$0	\$0	0.0
Upper Roof	Classrooms	1	Split-System Air-Source HP	3.00	42.70	W		No							0.0	0	0	\$0	\$0	\$0	0.0
Courtyard	Offices	1	Split-System Air-Source HP	8.00	108.00	W		No							0.0	0	0	\$0	\$0	\$0	0.0
Courtyard	Offices	1	Split-System Air-Source HP	3.00	34.00	W		No							0.0	0	0	\$0	\$0	\$0	0.0
Courtyard	Offices	1	Split-System Air-Source HP	14.00	188.00	N		No							0.0	0	0	\$0	\$0	\$0	0.0
Courtyard	Main Office/Principal	2	Split-System Air-Source HP	8.00	108.00	W		No							0.0	0	0	\$0	\$0	\$0	0.0
Courtyard	Classrooms	1	Split-System AC	0.75		W		No							0.0	0	0	\$0	\$0	\$0	0.0

Fuel Heating Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years	
Boiler Room	Boiler 1	1	Forced Draft Steam Boiler	#####	B	11	Yes	1	Forced Draft Steam Boiler	#####	81.00%	Et	0.0	0	562	\$5,148	\$172,090	\$0	33.4	
Boiler Room	Boiler 2	1	Forced Draft Steam Boiler	#####	B	11	Yes	1	Forced Draft Steam Boiler	#####	81.00%	Et	0.0	0	562	\$5,148	\$172,090	\$0	33.4	
Roof	New Gym RTU-1	1	Furnace	864.00	W		No						0.0	0	0	\$0	\$0	\$0	0.0	
Roof	New Gym RTU-2	1	Furnace	864.00	W		No						0.0	0	0	\$0	\$0	\$0	0.0	
Roof	Old Gym RTU-3	1	Furnace	328.10	W		No						0.0	0	0	\$0	\$0	\$0	0.0	
Roof	Old Gym RTU-4	1	Furnace	328.10	W		No						0.0	0	0	\$0	\$0	\$0	0.0	

Demand Control Ventilation Recommendations

Location	Area(s)/System(s) Affected	Recommendation Inputs					Energy Impact & Financial Analysis						
		ECM #	Number of Zones	Cooling Capacity of Controlled System (Tons)	Electric Heating Capacity of Controlled System (kBtu/hr)	Output Heating Capacity of Controlled System (MBh)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Upper Roof	New Gym RTU-1	12	1.00	50.00	0.00	864.00	0.0	1,604	24	\$458	\$1,359	\$0	3.0
Upper Roof	New Gym RTU-2	12	1.00	50.00	0.00	864.00	0.0	1,604	24	\$458	\$1,359	\$0	3.0
Upper Roof	Old Gym RTU-3	12	1.00	20.00	0.00	328.10	0.0	641	9	\$178	\$1,359	\$0	7.6
Upper Roof	Old Gym RTU-4	12	1.00	20.00	0.00	328.10	0.0	641	9	\$178	\$1,359	\$0	7.6

DHW Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
		System Quantity	System Type	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Domestic Hot Water	1	Storage Tank Water Heater (> 50 Gal)	B	13	Yes	1	Storage Tank Water Heater (> 50 Gal)	Natural Gas	95.00%	Et	0.0	0	92	\$846	\$26,057	\$910	29.7

Low-Flow Device Recommendations

Location	Recommendation Inputs					Energy Impact & Financial Analysis						
	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Restrooms	14	14	Faucet Aerator (Lavatory)	1.50	0.50	0.0	0	23	\$215	\$100	\$0	0.5

Walk-In Cooler/Freezer Inventory & Recommendations

		Existing Conditions		Proposed Conditions			Energy Impact & Financial Analysis						
Location	Cooler/Freezer Quantity	Case Type/Temperature	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Cooler (35F to 55F)	15, 16	Yes	No	Yes	0.1	1,291	0	\$194	\$2,281	\$75	11.4
Kitchen	1	Medium Temp Freezer (0F to 30F)	15, 16	Yes	Yes	Yes	0.1	1,991	0	\$299	\$2,799	\$125	8.9

Commercial Refrigerator/Freezer Inventory & Recommendations

		Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years	
Kitchen	2	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0	
Kitchen	1	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	Yes		No	0.0	0	0	\$0	\$0	\$0	0.0	
Kitchen	1	Stand-Up Refrigerator, Glass Door (≤15 cu. ft.)	No		No	0.0	0	0	\$0	\$0	\$0	0.0	

Commercial Ice Maker Inventory & Recommendations

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

Cooking Equipment Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Equipment Type	High Efficiency Equipment?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Electric Fryer	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
Kitchen	1	Electric Convection Oven (Half Size)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
Kitchen	1	Gas Griddle (≥6 Feet Width)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!
Teaching Room	1	Electric Griddle (≥6 Feet Width)	Yes		No	0.0	0	0	FALSE	\$0	\$0	#DIV/0!

Plug Load Inventory

Location	Existing Conditions			
	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified ?
Classrooms	302	Computers	120.0	Yes
Classrooms	6	Computer Cart	208.0	Yes
IDF Room	1	Servers	255.0	Yes
Offices	11	Laptop	120.0	Yes
Classrooms	69	Small Printer	46.0	Yes
Offices	25	Medium Printer	55.0	Yes
Main Office/Copy Room	11	Big Printer	600.0	Yes
Main Office	1	Paper Shredder	46.0	Yes
Classrooms	69	Projectors	120.0	Yes
Classrooms/Break Room	23	Microwave	800.0	No
Classrooms	15	Small Refrigerator	120.0	No
Break Room	4	Medium Refrigerator	145.0	Yes
Break Room	5	Large Refrigerator	255.0	Yes
Break Room	4	Coffee Machine	1,500.0	No
Break Room	2	Toaster	300.0	No
Break Room	5	Toaster Oven	550.0	No
Classrooms	19	Portable Fan	50.0	Yes
Kitchen/Basement	2	Clothes Washer	500.0	Yes
Kitchen/Basement	2	Clothes Dryer	800.0	Yes
Teaching Room	4	Dishwasher	1,000.0	Yes
Classrooms	9	CRT Tv	244.0	No
Classrooms	2	Plasma Tv	220.0	No
Classrooms	2	LCD Tv - 42"	120.0	Yes
Classrooms	2	LCD Tv - 50"	120.0	Yes
Main Lobby	3	LED Tv - 50"	120.0	Yes
Teaching Room	2	Oven	500.0	Yes
Classrooms	4	Smart Boards	120.0	Yes
Classrooms	3	Plant Grow Light -T12 2 Bulb Fix	88.0	No
Classrooms	2	Incandenscent Bulb	60.0	No
Classrooms	2	LED Bulb	10.0	Yes
Art Room	1	Small Kiln	8,320.0	Yes
Art Room	1	Large Kiln	11,000.0	Yes
Kitchen	4	Steam Serving Table	120.0	No
Woodshop	1	Benchtop Router Table	1,725.0	Yes
Woodshop	1	Wood Planer	345.0	No

Vending Machine Inventory & Recommendations

Location	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Gym Area	2	Refrigerated	17	Yes	0.4	3,224	0	\$484	\$460	\$100	0.7
Cafeteria	1	Non-Refrigerated	17	Yes	0.0	343	0	\$51	\$230	\$0	4.5
Cafeteria	3	Glass Fronted Refrigerated	17	Yes	0.4	3,627	0	\$544	\$690	\$150	1.0

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

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

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

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ENERGY STAR®
Score¹

Ramsey High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 200,520
Built: 1936

For Year Ending: October 31, 2018
Date Generated: May 06, 2019

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

Property & Contact Information		
Property Address Ramsey High School 258 E Main Street Ramsey, New Jersey 07446	Property Owner Ramsey Board of Education 268 East Main Street Ramsey, NJ 07446 () -	Primary Contact Thomas O'Hern 268 East Main Street Ramsey, NJ 07446 2017852300 tohern@ramsey.k12.nj.us
Property ID: 8769651		

Energy Consumption and Energy Use Intensity (EUI)			
Site EUI 82.9 kBtu/ft ²	Annual Energy by Fuel		National Median Comparison
	Electric - Grid (kBtu)	4,695,977 (28%)	National Median Site EUI (kBtu/ft ²)
	Natural Gas (kBtu)	11,920,844 (72%)	National Median Source EUI (kBtu/ft ²)
			% Diff from National Median Source EUI
			-7%
Source EUI 128 kBtu/ft ²			Annual Emissions
			Greenhouse Gas Emissions (Metric Tons CO ₂ e/year)
			818

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

() -



Professional Engineer Stamp
(if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate 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	<i>British thermal unit</i> : 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	<i>Combined heat and power</i> . Also referred to as cogeneration.
COP	<i>Coefficient of performance</i> : 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	<i>Demand control ventilation</i> : a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	<i>United States Department of Energy</i>
EC Motor	<i>Electronically commutated motor</i>
ECM	<i>Energy conservation measure</i>
EER	<i>Energy efficiency ratio</i> : a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	<i>Energy Use Intensity</i> : 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	<i>United States Environmental Protection Agency</i>
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	<i>Greenhouse gas</i> : 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	<i>Gallons per flush</i>

gpm	<i>Gallon per minute</i>
HID	<i>High intensity discharge</i> : high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	<i>Horsepower</i>
HPS	<i>High-pressure sodium</i> : a type of HID lamp.
HSPF	<i>Heating seasonal performance factor</i> : a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	<i>Heating, ventilating, and air conditioning</i>
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	<i>Integrated part load value</i> : a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units
kW	<i>Kilowatt</i> : equal to 1,000 Watts.
kWh	<i>Kilowatt-hour</i> : 1,000 Watts of power expended over one hour.
LED	<i>Light emitting diode</i> : a high-efficiency source of light with a long lamp life.
LGEA	<i>Local Government Energy Audit</i>
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	<i>Metal halide</i> : a type of HID lamp.
MBh	<i>Thousand Btu per hour</i>
MBtu	<i>One thousand British thermal units</i>
MMBtu	<i>One million British thermal units</i>
MV	<i>Mercury Vapor</i> : a type of HID lamp.
NJBPU	<i>New Jersey Board of Public Utilities</i>
NJCEP	<i>New Jersey Clean Energy Program</i> : 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	<i>Photovoltaic</i> : refers to an electronic device capable of converting incident light directly into electricity (direct current).

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