Local Government Energy Audit:
Energy Audit Report

Ramapo High School

Ramapo Indian Hills School

331 George Street
Franklin Lakes, New Jersey 07417

December 3, 2018

Final Report by:

TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities and recommend upgrades to the facility's energy using equipment and systems. Approximate savings are included in this report to help make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. Further design and analysis may be necessary in order to implement some of the measures recommended in this report.

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

Estimated installation costs are based on TRC's experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from *RS Means*. The owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Since actual installed costs can vary widely for certain 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. The owner of the facility should review available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

Table of Contents

Table of Figures

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Ramapo Indian Hills HSD - Ramapo High School.

The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey school districts in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

Ramapo Indian Hills HSD - Ramapo High School is a 241,600 square foot facility comprised of a two-story building with multiple sections that include classrooms, offices, indoor gymnasium, locker rooms, kitchen, auditorium and cafeteria. The building is occupied by 1,100 students and 180 staff. The gymnasium and auditorium are used after hours. The classrooms hours of operation are between 7:00 AM and 2:45 PM during the weekdays and it operates on a ten-month schedule.

The foundation consists of cast-in-place concrete perimeter wall footings with concrete walls. Exterior walls are finished with brick masonry. The building has a flat roof covered with a multiply bituminous built-up membrane that is under warranty and appears to be in good condition.

The building's interior lighting consists mainly of linear fluorescent T8 fixtures with electronic ballasts as well as some LED and incandescent fixtures. Lighting is controlled throughout the building by manual switches and occupancy sensors. The building's exterior illumination is provided by a combination of LED and HID fixtures that are controlled with photocells.

Heating is supplied by natural gas-fired hot water boilers and natural gas-fired furnaces which are located inside rooftop air handling units (RTUs). The majority of the building is served by the RTUs, air handling units (AHUs), split system air conditioners, heat pumps and a few window AC units for comfort cooling and heating. Air is exhausted in restrooms, hallways and common areas by roof-mounted exhaust fans. A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 15 measures and recommends 12 measures which together represent an opportunity for Ramapo Indian Hills HSD - Ramapo High School to reduce annual energy costs by $73,508 and annual greenhouse gas emissions by 611,715 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 5.1 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce Ramapo Indian Hills HSD - Ramapo High School's annual energy use by 9%.

Figure 1 – Previous 12 Month Utility Costs

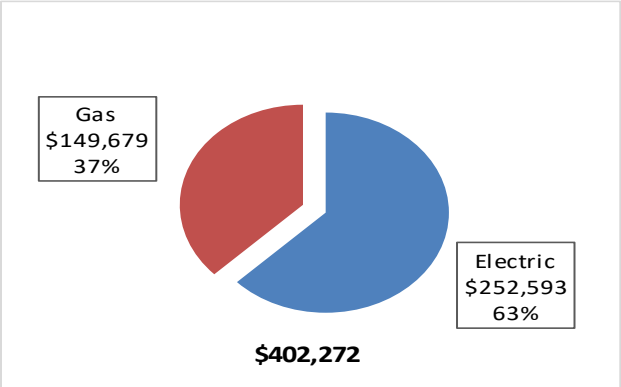
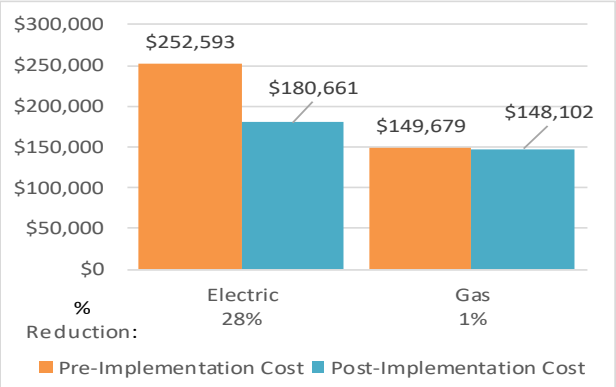


Figure 2 – Potential Post-Implementation Costs



A detailed description of Ramapo Indian Hills HSD - Ramapo High School's existing energy use can be found in Section 3.

Estimates of the total cost, energy savings, and financial incentives for the proposed energy efficient upgrades are summarized below in Figure 3. A brief description of each category can be found below and a description of savings opportunities can be found in Section 4.

Figure 3 – Summary of Energy Reduction Opportunities

	Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**390,625**	**138.8**	**0.0**	**$47,893.98**	**$249,493.01**	**$55,235.00**	**$194,258.01**	**4.1**	**393,356**
ECM 1	Install LED Fixtures	Yes	29,391	7.7	0.0	$3,603.53	$72,950.03	$12,650.00	$60,300.03	16.7	29,596
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	3,271	1.1	0.0	$401.10	$1,844.80	$240.00	$1,604.80	4.0	3,294
ECM 3	Retrofit Fixtures with LED Lamps	Yes	357,419	130.0	0.0	$43,822.65	$174,263.69	$42,345.00	$131,918.69	3.0	359,918
ECM 4	Install LED Exit Signs	Yes	544	0.0	0.0	$66.70	$434.49	$0.00	$434.49	6.5	548
Lighting Control Measures			**108,538**	**29.8**	**0.0**	**$13,307.73**	**$180,130.00**	**$19,215.00**	**$160,915.00**	**12.1**	**109,297**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	83,567	24.2	0.0	$10,245.99	$158,490.00	$18,795.00	$139,695.00	13.6	84,151
ECM 6	Install High/Low Lighitng Controls	Yes	24,972	5.6	0.0	$3,061.74	$21,640.00	$420.00	$21,220.00	6.9	25,146
Electric Unitary HVAC Measures			**29,218**	**17.3**	**0.0**	**$3,582.38**	**$971,432.90**	**$10,355.50**	**$961,077.40**	**268.3**	**29,422**
	Install High Efficiency Electric AC	No	29,218	17.3	0.0	$3,582.38	$971,432.90	$10,355.50	$961,077.40	268.3	29,422
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**1,289.8**	**$11,373.69**	**$377,010.94**	**$26,699.20**	**$350,311.74**	**30.8**	**151,021**
	Install High Efficiency Hot Water Boilers	No	0	0.0	759.6	$6,698.60	$243,298.69	$22,299.20	$220,999.49	33.0	88,945
	Install High Efficiency Furnaces	No	0	0.0	530.2	$4,675.10	$133,712.25	$4,400.00	$129,312.25	27.7	62,076
HVAC System Improvements			**82,775**	**16.6**	**86.4**	**$10,911.20**	**$23,992.86**	**$2,750.00**	**$21,242.86**	**1.9**	**93,475**
ECM 7	Install Dual Enthalpy Outside Economizer Control	Yes	73,871	16.6	0.0	$9,057.18	$12,900.00	$2,750.00	$10,150.00	1.1	74,387
ECM 8	Implement Demand Control Ventilation	Yes	8,905	0.0	74.0	$1,744.56	$10,875.36	$0.00	$10,875.36	6.2	17,634
ECM 9	Install Pipe Insulation	Yes	0	0.0	12.4	$109.46	$217.50	$0.00	$217.50	2.0	1,453
Domestic Water Heating Upgrade			**0**	**0.0**	**92.4**	**$814.46**	**$415.86**	**$0.00**	**$415.86**	**0.5**	**10,815**
ECM 10	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	92.4	$814.46	$415.86	$0.00	$415.86	0.5	10,815
Food Service Equipment & Refrigeration Measures			**1,173**	**0.0**	**0.0**	**$143.77**	**$1,037.21**	**$100.00**	**$937.21**	**6.5**	**1,181**
ECM 11	Refrigeration Controls	Yes	1,173	0.0	0.0	$143.77	$1,037.21	$100.00	$937.21	6.5	1,181
Plug Load Equipment Control - Vending Machine			**3,566**	**0.0**	**0.0**	**$437.25**	**$690.00**	**$0.00**	**$690.00**	**1.6**	**3,591**
ECM 12	Vending Machine Control	Yes	3,566	0.0	0.0	$437.25	$690.00	$0.00	$690.00	1.6	3,591
TOTALS FOR HIGH PRIORITY MEASURES			**586,677**	**185.3**	**178.8**	**$73,508.40**	**$455,758.94**	**$77,300.00**	**$378,458.94**	**5.1**	**611,715**
TOTALS FOR ALL EVALUATED MEASURES			**615,895**	**202.6**	**1,468.6**	**$88,464.48**	**$1,804,202.78**	**$114,354.70**	**$1,689,848.08**	**19.1**	**792,158**

* - All incentives presented in this table are based on NJ Smart Start Building 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).

Lighting Upgrades generally involve the replacement of existing lighting components such as lamps and ballasts (or the entire fixture) with higher efficiency lighting components. These measures save energy by reducing the power used by the lighting components due to improved electrical efficiency.

Lighting Controls measures generally involve the installation of automated controls to turn off lights or reduce light output when not needed. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

Electric Unitary HVAC measures generally involve replacing older inefficient air conditioning systems with modern energy efficient systems. New air conditioning systems can provide equivalent cooling to older air condition systems at a reduced energy cost. These measures save energy by reducing the power used by the air conditioning systems, due to improved electrical efficiency.

Gas Heating (HVAC/Process) measures generally involve replacing older inefficient hydronic heating systems with modern energy efficient systems. Gas heating systems can provide equivalent heating compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel demands for heating, due to improved combustion and heat transfer efficiency.

HVAC System Improvements generally involve the installation of automated controls to reduce heating and cooling demand during periods of reduced demand. These measures could encompass changing temperature setpoints, using outside air for free cooling, or limiting excessive outside air during extreme outdoor air temperature conditions. These measures save energy by reducing the demand on HVAC systems and the amount of time systems operate.

Domestic Hot Water upgrade measures generally involve replacing older inefficient domestic water heating systems with modern energy efficient systems. New domestic hot water heating systems can provide equivalent, or greater, water heating capacity compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel used for domestic hot water heating due to improved heating efficiency or reducing standby losses.

Food Service Equipment & Refrigeration measures generally involve improvements in the efficiency of cooking, food service, dishwashing, and food storage equipment. These measures may include more efficient convection ovens, steamers, ice machines, or refrigeration. These measures save energy by reducing the energy usage with more energy efficient equipment.

Plug Load Equipment control measures generally involve installing automated devices that limit the power usage or operation of equipment that is plugged into an electric outlet when not in use.

Energy Efficient Practices

TRC also identified 13 low cost (or no cost) energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at Ramapo Indian Hills HSD - Ramapo High School include:

- Close Doors and Windows
- Use Window Treatments/Coverings
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Perform Routine Motor Maintenance
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Ensure Economizers are Functioning Properly
- Clean Evaporator/Condenser Coils on AC Systems
- Perform Proper Boiler Maintenance
- Perform Proper Furnace Maintenance
- Install Plug Load Controls
- Water Conservation
- Re-Insulate Evaporator Refrigerant Lines in RTUs & DX Units

For details on these energy efficient practices, please refer to Section 5.

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for Ramapo Indian Hills HSD - Ramapo High School. Based on the configuration of the site and its loads there is a moderate potential for installing a photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	Medium	
System Potential	581	kW DC STC
Electric Generation	692,186	kWh/yr
Displaced Cost	$60,220	/yr
Installed Cost	$2,265,900	

For details on our evaluation and on-site generation potential, please refer to Section 6.

1.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, a project implementation plan must be developed. Available capital must be considered, and decisions need to be made whether it is best to pursue individual ECMs separately, groups of ECMs, or a comprehensive approach where all ECMs are implemented together, possibly in conjunction with other facility upgrades or improvements.

Rebates, incentives, and financing are available from NJCEP, as well as other sources, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any measure, please review the relevant incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives prior to purchasing materials or commencing with installation.

The ECMs outlined in this report may qualify under the following program(s):

- SmartStart
- SREC (Solar Renewable Energy Certificate) Registration Program (SRP)
- Energy Savings Improvement Program (ESIP)

For facilities wanting 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 in this program you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 3 are based on the SmartStart program. More details on this program and others are available in Section 8.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (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. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce 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. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage 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 DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

Additional information on relevant incentive programs is located in Section 8. You may also check the following website for more details: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Frank Ceurvels	School Business Administrator	fceurvels@rih.org	201-416-8100
TRC Energy Services			
Moussa Traore	Auditor	mtraore@trcsolutios.com	(732) 855-0033

2.2 General Site Information

On July 26, 2018, TRC performed an energy audit at Ramapo Indian Hills HSD - Ramapo High School located in Franklin Lakes, New Jersey. TRC's auditor met with Paul Cusack to review the facility operations and help focus our investigation on specific energy-using systems.

Ramapo Indian Hills HSD - Ramapo High School is a 241,600 square foot facility comprised of a two-story building with multiple sections that include classrooms, offices, indoor gymnasium, locker rooms, kitchen, auditorium and cafeteria. The building was constructed in 1956 and was last renovated in 2004.

Image 1: Auditorium

2.3 Building Occupancy

The building is in operation ten months out of the year. General operation is 6:30 AM to 10:00 PM Monday through Friday. The school is cleaned after hours between 6:00 PM and 10:00 PM. The building is occupied by 1,100 students and about 180 staff. The typical schedule is presented in the table below.

Figure 6 - Building Schedule

Building Occupancy Schedule		
Building Name	**Weekday/Weekend**	**Operating Schedule**
Ramapo High School	Weekday	6:30 AM - 10:00 PM
Ramapo High School	Weekend	8:30 AM - 3:30 PM (Saturday)

2.4 Building Envelope

The building is constructed of concrete block and structural steel with a brick facade. The buildings have flat roof sections covered with roofing membrane that is in good condition. The buildings have clear and translucent double-pane windows which are in good condition and show little sign of excessive outside air infiltration. The exterior doors are constructed of metal and glass and are in good condition.

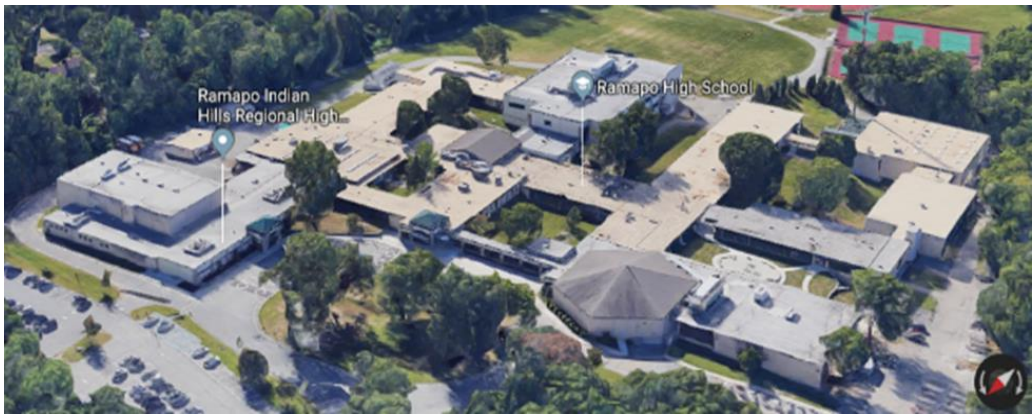


Image 2: Facility Aerial View

Image 3: Typical Walls & Exterior Door

2.5 On-Site Generation

Ramapo Indian Hills HSD - Ramapo High School does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

Please see Appendix A: Equipment Inventory & Recommendations for an inventory of the facility's equipment.

Lighting System

Lighting at the facility is provided mostly by 32-Watt linear fluorescent T8 lamps with electronic ballasts as well as some U-shaped fluorescent lamps, compact fluorescent lamps (CFL), linear T5 fluorescent lamps, T12 linear fluorescent lamps, LED linear and screw-in lamps and high intensity discharge (HID) fixtures. Most of the fixtures are 1, 2 or 3-lamp, 4-foot long troffers with diffusers.

A small area of the building including library, hallways and classrooms are primarily lit with screw-in and 4-pin base CFL lamps in recessed can ceiling fixtures. Parts of the gym, cafeteria, and a few offices and classrooms have been retrofitted with LED linear tubes and fixtures. Service spaces, including restrooms and storage spaces are lit with various linear fluorescent T8 and U-bend T8 lamps in troffer fixtures, and CFL, incandescent and LED lamps in recessed can ceiling fixtures. Exit signs in the building are a mixture of fluorescent and LED fixtures. Lighting is controlled by wall switches in most spaces and is turned on during operating hours of the building. Some lighting fixtures, primarily LEDs, are fitted with occupancy sensors.

The building's exterior lighting consists mainly of wall-mounted fixtures and few parking lot pole fixtures. Sources include high pressure sodium (HPS) fixtures, metal halide (MH) fixtures, LED wall packs and CFL screw-in lamps. All exterior lighting is controlled by daylight sensors.

Image 4: Gymnasium LED Fixtures

Image 5: Typical Fluorescent Tubes Lighting

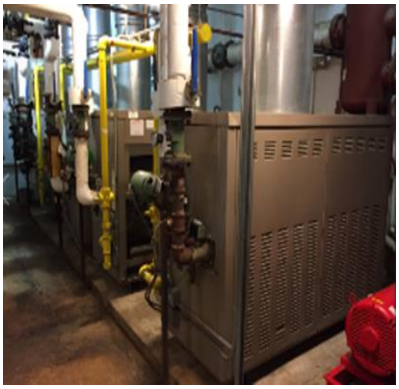
Image 6: Typical Recessed Lighting Fixtures

Image 7: Typical Exterior Wall pack Fixtures

Hot Water Heating System

The hot water system consists of 10 A.O. Smith 1,448 kBtu/hr output, non-condensing boilers. The boilers have a nominal combustion efficiency of 80%. The hot water is distributed throughout the building in two loops, one loop supplies heat to the 700-800 section of the building and the other serves the rest of the building. The bigger loop is served by two 60 hp pumps and the other loop is served by two 10 hp pumps. All pumps are equipped with VFDs. The boilers provide hot water to air handlers, unit ventilators and radiators throughout the school.

The boilers operate in a lead/lag configuration. All boilers may be required during very cold weather. The lead boiler is rotated weekly. Seven of the ten boilers are 18 years old and nearing end of useful life. The hot water system is enabled based upon outside air temperature. The heating hot water system is controlled via the Johnson Controls Metasys Energy Management System. The typical space temperature set points are 72°F during occupied and 65°F during unoccupied heating periods.



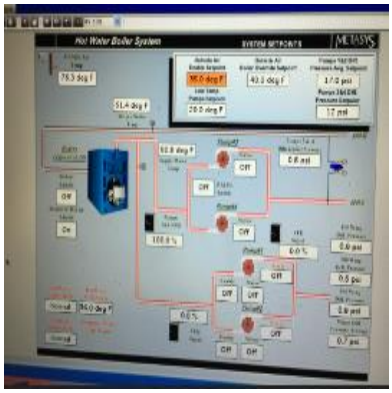


Image 8: Non-Condensing Hot Water Boilers

Direct Expansion Air Conditioning System (DX)

Approximately 30% of the building spaces are mechanically cooled. Systems include packaged rooftop units (RTUs), direct-expansion (DX) cooling split-system ACs, split-system heat pumps and window AC units. Most of the units are located on the roof and serve various building spaces: offices, auditorium, cafeteria, music room, dance studio and a few single zone rooms. There are 17 packaged rooftop units (RTUs) with built-in DX units throughout the building providing heating and cooling to various areas. Some of the RTUs are equipped with natural gas-fired furnaces, providing supplemental heat for certain zones. Unit sizes vary from 5 to 110 tons of cooling capacity. Many of these units are nearing end of useful life and the customer is looking to replace them.

There are 18 split-system air conditioner and heat pumps throughout the building. The size of the units ranges from 0.75 ton to 6 tons. There are also a few window air-conditioning units that serve offices; these have an approximate cooling capacity of 2 tons each.

All of the units are connected to the Building Energy Management System (BEMS) with the exception of smaller split ac units and window units.

Image 9: Split System ACs

Image 10: Roof Top Package Units

Building Energy Management System (BEMS)

The majority of the facility HVAC (boilers, AHUs, RTUs, DX units, unit ventilators, fan coil units) are controlled with a Johnson Controls Metasys Building Energy Management System (BEMS).

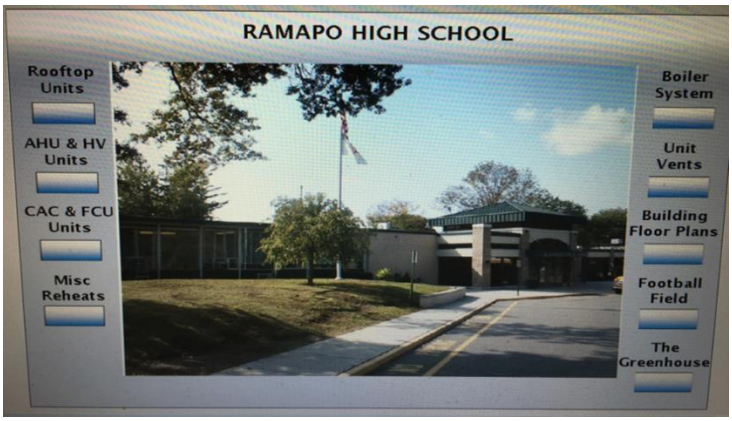


Image 11: The Metasys BEMS System Homepage

Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of four A.O. Smith gas fired condensing water heaters with an input rating of 200 kBtu/hr each and a nominal efficiency of 97%. Each water heater has a 100-gallon storage tank. Boilers are served by ¼ hp pumps that distribute water at 140°F.

Two of the boilers serve the lower gym locker room, 400, and 500 & 600 section restrooms. The remaining two boilers serve the rest of the building. The heaters appear to be in good condition.

Image 12: DHW Heaters

Food Service & Laundry Equipment

The facility has a full commercial kitchen that is used to prepare breakfast and lunch for the employees and students. The ovens, range tops and griddle are all gas fired. There is a conveyor dishwasher with an electric water heater that provides 145°F rinse water. The kitchen is well maintained.

Image 13: Kitchen Gas Cooking Equipment & Steamers

Image 14: Dishwasher

Refrigeration

The kitchen has three walk-in units that are used to store food prepared for school lunches. Two of them are medium temperature freezers rated at approximately 1 ton each and one cooler is rated at approximately 0.5 ton. The kitchen also has several free standing commercial size refrigerators and ice makers.

Image 15: Refrigeration Systems

Building Plug Load

There are roughly 50 computer work stations throughout the facility. Roughly 90% of the computers are desktop units with LCD monitors. There is no centralized PC power management software installed. The plug loads in the building also consist of refrigerators, microwaves, televisions, copy machines, printers, coffee machines, toasters, water coolers and washing machines. The facility has two refrigerated vending machines and one non-refrigerated vending machine.

2.7 Water-Using Systems

There are several restrooms at this facility. A sampling of restrooms found that many of the faucets are rated for 2.2 gallons per minute (gpm) or higher. The school has a girls and boys locker room. Both locker rooms use high efficiency showerhead fittings.

3 SITE ENERGY USE AND COSTS

Utility data for electricity and natural gas was analyzed to identify opportunities for savings. In addition, data for electricity and natural gas was evaluated to determine the annual energy performance metrics for the building in energy cost per square foot and energy usage per square foot. These metrics are an estimate of the relative energy efficiency of this building. There are a number of factors that could cause the energy use of this building to vary from the "typical" energy usage profile for facilities with similar characteristics. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and energy efficient behavior of occupants all contribute to benchmarking scores. Please refer to the Benchmarking section within Section 3.4 for additional information.

3.1 Total Cost of Energy

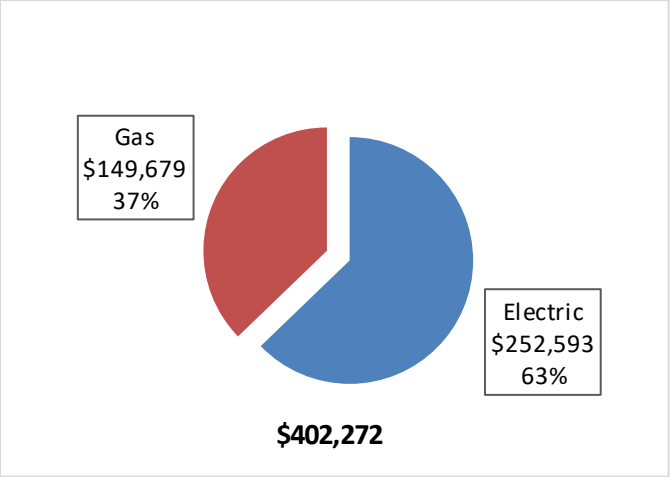
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Ramapo High School		
Fuel	**Usage**	**Cost**
Electricity	2,060,157 kWh	$252,593
Natural Gas	169,741 Therms	$149,679
Total		**$402,272**

The current annual energy cost for this facility is $402,272 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by Rockland Electric. The average electric cost over the past 12 months was $0.123/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below. The electricity use profile reflects low occupancy in the summer months.

Figure 9 - Electric Usage & Demand

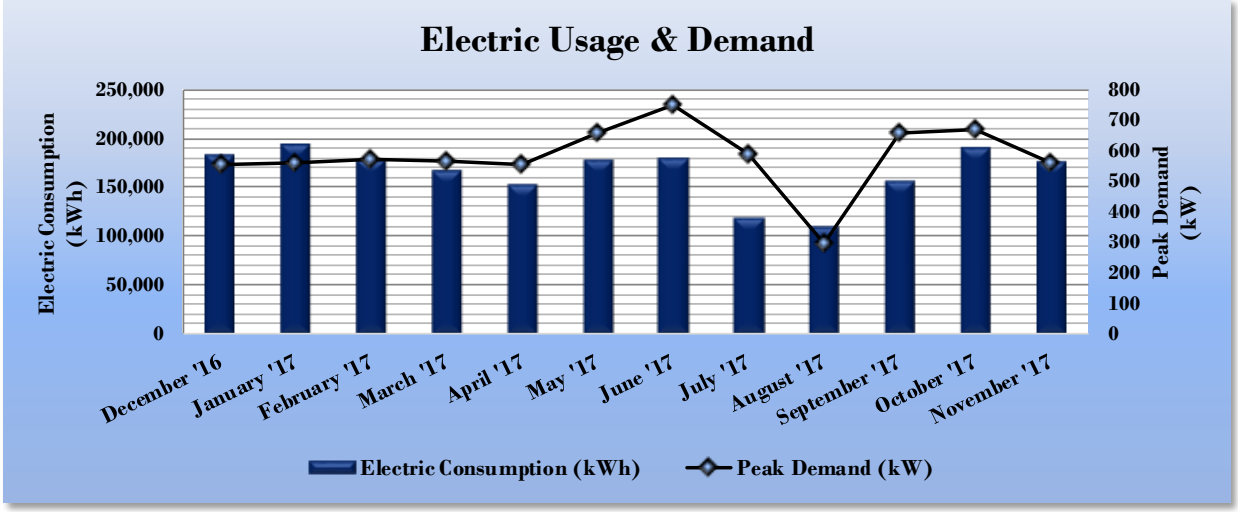


Figure 10 - Electric Usage & Demand

Electric Billing Data for Ramapo High School						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
12/22/16	29	184,259	552	$3,536	$21,565	No
1/25/17	33	195,356	560	$3,581	$22,660	No
2/23/17	28	178,987	570	$3,651	$21,134	No
3/23/17	27	168,327	564	$3,754	$20,216	No
4/21/17	28	153,412	551	$3,704	$18,718	No
5/22/17	30	177,661	656	$4,406	$21,780	No
6/21/17	29	181,112	752	$5,655	$23,365	No
7/21/17	29	119,087	591	$4,644	$16,318	No
8/22/17	31	110,284	293	$2,301	$13,212	No
9/22/17	30	157,452	655	$5,150	$20,751	No
10/23/17	30	190,532	668	$4,685	$23,475	No
11/22/17	29	175,957	559	$3,758	$21,094	No
Totals	**353**	**1,992,426**	**752**	**$48,824**	**$244,289**	0
Annual	**365**	**2,060,157**	**752**	**$50,484**	**$252,593**	

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is $0.882/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below. The gas use profile is typical for a facility with a significant heating load relative to other end uses.

Figure 11 - Natural Gas Usage

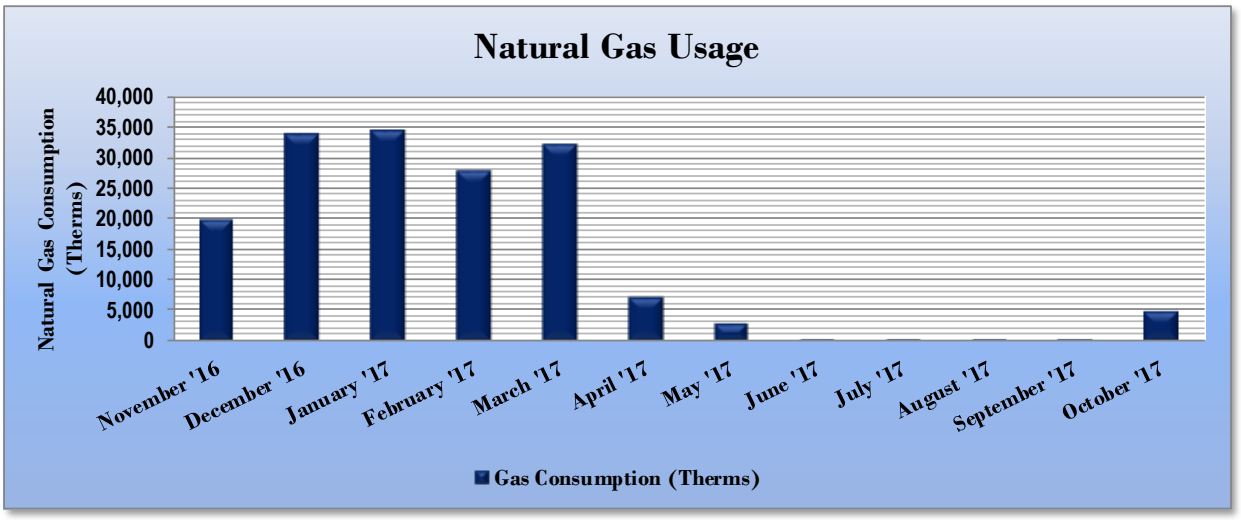


Figure 12 - Natural Gas Usage

Gas Billing Data for Ramapo High School				
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost	TRC Estimated Usage?
11/30/16	29	19,897	$17,944	No
12/31/16	30	34,045	$29,642	No
1/31/17	30	34,473	$33,706	No
2/28/17	27	27,881	$26,544	No
3/31/17	30	32,283	$27,349	No
4/30/17	29	7,387	$4,347	No
5/31/17	30	3,072	$1,862	No
6/30/17	29	114	$174	No
7/31/17	30	3	$109	No
8/31/17	30	4	$109	No
9/30/17	29	36	$127	No
10/31/17	30	4,964	$2,845	No
Totals	**353**	**164,161**	**$144,758**	0
Annual	**365**	**169,741**	**$149,679**	

3.4 Benchmarking

This facility was benchmarked using Portfolio Manager®, an online tool created and managed by the United States Environmental Protection Agency (EPA) through the ENERGY STAR® program. Portfolio Manager® analyzes your building's consumption data, cost information, and operational use details and then compares its performance against a national median for similar buildings of its type. Metrics provided by this analysis are Energy Use Intensity (EUI) and an ENERGY STAR® score for select building types.

The EUI is a measure of a facility's energy consumption per square foot, and it is the standard metric for comparing buildings' energy performance. Comparing the EUI of a building with the national median EUI for that building type illustrates whether that building uses more or less energy than similar buildings of its type on a square foot basis. 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.

Figure 13 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Ramapo High School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	165.1	141.4
Site Energy Use Intensity (kBtu/ft^2)	99.4	58.2

Implementation of all recommended measures in this report would improve the building's estimated EUI significantly, as shown in the table below:

Figure 14 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Ramapo High School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	138.3	141.4
Site Energy Use Intensity (kBtu/ft^2)	90.3	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. Your building is one of the building categories that are eligible to receive a score. This facility has a current score of 22.

A Portfolio Manager® Statement of Energy Performance (SEP) was generated for this facility, see Appendix B: ENERGY STAR® Statement of Energy Performance.

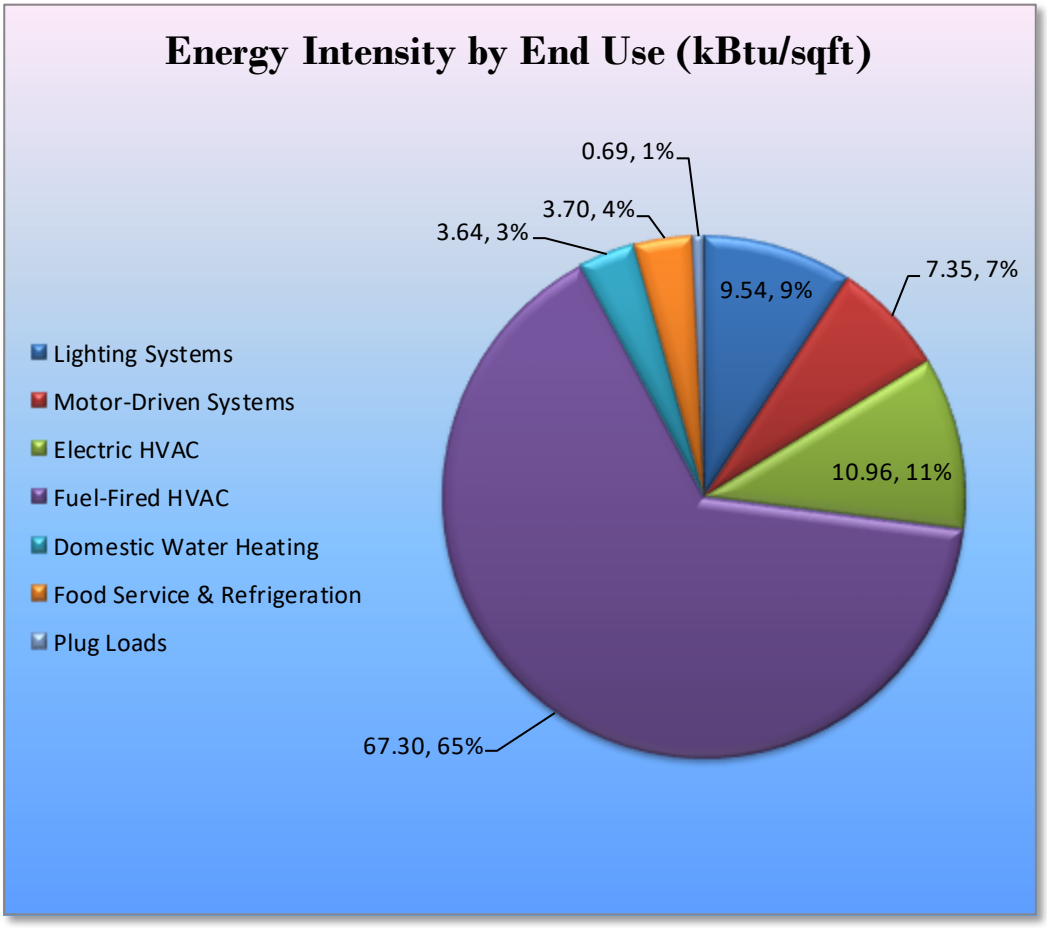
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

A Portfolio Manager® account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance. 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.

3.5 Energy End-Use Breakdown

In order to provide a complete overview of energy consumption across building systems, an energy balance was performed at this facility. An energy balance utilizes standard practice engineering methods to evaluate all components of the various electric and fuel-fired systems found in a building to determine their proportional contribution to overall building energy usage. This chart of energy end uses highlights the relative contribution of each equipment category to total energy usage. This can help determine where the greatest benefits might be found from energy efficiency measures.

Figure 15 - Energy Balance (% and kBtu/SF)



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Ramapo Indian Hills HSD - Ramapo High School regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016, 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. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

The measures below have been evaluated by the auditor and are recommended for implementation at the facility.

Figure 16 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**390,625**	**138.8**	**0.0**	**$47,893.98**	**$249,493.01**	**$55,235.00**	**$194,258.01**	**4.1**	**393,356**
ECM 1	Install LED Fixtures	29,391	7.7	0.0	$3,603.53	$72,950.03	$12,650.00	$60,300.03	16.7	29,596
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	3,271	1.1	0.0	$401.10	$1,844.80	$240.00	$1,604.80	4.0	3,294
ECM 3	Retrofit Fixtures with LED Lamps	357,419	130.0	0.0	$43,822.65	$174,263.69	$42,345.00	$131,918.69	3.0	359,918
ECM 4	Install LED Exit Signs	544	0.0	0.0	$66.70	$434.49	$0.00	$434.49	6.5	548
Lighting Control Measures		**108,538**	**29.8**	**0.0**	**$13,307.73**	**$180,130.00**	**$19,215.00**	**$160,915.00**	**12.1**	**109,297**
ECM 5	Install Occupancy Sensor Lighting Controls	83,567	24.2	0.0	$10,245.99	$158,490.00	$18,795.00	$139,695.00	13.6	84,151
ECM 6	Install High/Low Lighitng Controls	24,972	5.6	0.0	$3,061.74	$21,640.00	$420.00	$21,220.00	6.9	25,146
HVAC System Improvements		**82,775**	**16.6**	**86.4**	**$10,911.20**	**$23,992.86**	**$2,750.00**	**$21,242.86**	**1.9**	**93,475**
ECM 7	Install Dual Enthalpy Outside Economizer Control	73,871	16.6	0.0	$9,057.18	$12,900.00	$2,750.00	$10,150.00	1.1	74,387
ECM 8	Implement Demand Control Ventilation	8,905	0.0	74.0	$1,744.56	$10,875.36	$0.00	$10,875.36	6.2	17,634
ECM 9	Install Pipe Insulation	0	0.0	12.4	$109.46	$217.50	$0.00	$217.50	2.0	1,453
Domestic Water Heating Upgrade		**0**	**0.0**	**92.4**	**$814.46**	**$415.86**	**$0.00**	**$415.86**	**0.5**	**10,815**
ECM 10	Install Low-Flow Domestic Hot Water Devices	0	0.0	92.4	$814.46	$415.86	$0.00	$415.86	0.5	10,815
Food Service Equipment & Refrigeration Measures		**1,173**	**0.0**	**0.0**	**$143.77**	**$1,037.21**	**$100.00**	**$937.21**	**6.5**	**1,181**
ECM 11	Refrigeration Controls	1,173	0.0	0.0	$143.77	$1,037.21	$100.00	$937.21	6.5	1,181
Plug Load Equipment Control - Vending Machine		**3,566**	**0.0**	**0.0**	**$437.25**	**$690.00**	**$0.00**	**$690.00**	**1.6**	**3,591**
ECM 12	Vending Machine Control	3,566	0.0	0.0	$437.25	$690.00	$0.00	$690.00	1.6	3,591
TOTALS		**586,677**	**185.3**	**178.8**	**$73,508.40**	**$455,758.94**	**$77,300.00**	**$378,458.94**	**5.1**	**611,715**

* - All incentives presented in this table are based on NJ Smart Start Building 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).

4.1.1 Lighting Upgrades

Our recommendations for upgrades to existing lighting fixtures are summarized in Figure 17 below.

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**390,625**	**138.8**	**0.0**	**$47,893.98**	**$249,493.01**	**$55,235.00**	**$194,258.01**	**4.1**	**393,356**
ECM 1	Install LED Fixtures	29,391	7.7	0.0	$3,603.53	$72,950.03	$12,650.00	$60,300.03	16.7	29,596
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	3,271	1.1	0.0	$401.10	$1,844.80	$240.00	$1,604.80	4.0	3,294
ECM 3	Retrofit Fixtures with LED Lamps	357,419	130.0	0.0	$43,822.65	$174,263.69	$42,345.00	$131,918.69	3.0	359,918
ECM 4	Install LED Exit Signs	544	0.0	0.0	$66.70	$434.49	$0.00	$434.49	6.5	548

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	14,820	3.2	0.0	$1,817.09	$37,981.45	$9,020.00	$28,961.45	15.9	14,924
Exterior	14,570	4.5	0.0	$1,786.44	$34,968.58	$3,630.00	$31,338.58	17.5	14,672

Measure Description

We recommend replacing existing fixtures containing high intensity discharge lamps with new high performance LED light fixtures. Replace the metal halide (MH) and high pressure sodium (HPS) fixtures located along the building exterior and metal halide fixtures serving the lower gym, boiler room and parking lot. Consider specifying interior LED fixtures with on-board occupancy controls for additional savings. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output. The measure payback, especially for interior areas, is projected as long. TRC notes that pricing for LED fixtures continues to drop, and our payback estimates are accordingly conservative for this measure.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of HID lamps.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	3,271	1.1	0.0	$401.10	$1,844.80	$240.00	$1,604.80	4.0	3,294
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend retrofitting existing fluorescent fixtures containing T12 by removing fluorescent tubes and ballasts and replacing them with LEDs and LED drivers (if necessary), which are designed to be used retrofitted fluorescent fixtures. The measure uses the existing fixture housing but replaces the rest of the components with more efficient lighting technology. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent tubes.

ECM 3: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	350,767	128.0	0.0	$43,007.03	$172,154.39	$42,285.00	$129,869.39	3.0	353,219
Exterior	6,652	2.0	0.0	$815.63	$2,109.30	$60.00	$2,049.30	2.5	6,699

Measure Description

We recommend retrofitting existing fluorescent T8, incandescent lamps and compact fluorescent lamps (CFL) with LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed while leaving the fluorescent fixture ballast in place. LED bulbs 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.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent tube and more than 10 times longer than many incandescent lamps.

ECM 4: Install LED Exit Signs

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	544	0.0	0.0	$66.70	$434.49	$0.00	$434.49	6.5	548
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend replacing all compact fluorescent exit signs with LED exit signs. LED exit signs require virtually no maintenance and have a life expectancy of at least 20 years. This measure saves energy by installing LED fixtures, which use less power than other technologies with an equivalent lighting output.

4.1.2 Lighting Control Measures

Our recommendations for lighting control measures are summarized in Figure 18 below.

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**108,538**	**29.8**	**0.0**	**$13,307.73**	**$180,130.00**	**$19,215.00**	**$160,915.00**	**12.1**	**109,297**
ECM 5	Install Occupancy Sensor Lighting Controls	83,567	24.2	0.0	$10,245.99	$158,490.00	$18,795.00	$139,695.00	13.6	84,151
ECM 6	Install High/Low Lighitng Controls	24,972	5.6	0.0	$3,061.74	$21,640.00	$420.00	$21,220.00	6.9	25,146

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 5: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
83,567	24.2	0.0	$10,245.99	$158,490.00	$18,795.00	$139,695.00	13.6	84,151

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in many restrooms, storage rooms, classrooms, offices, conference room and library. Lighting sensors detect occupancy using ultrasonic and/or infrared sensors. For most spaces, we recommend lighting controls use dual technology sensors, which can eliminate the possibility of any lights turning off unexpectedly. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Some controls also provide dimming options and all modern occupancy controls can be easily over-ridden by room occupants to allow them to manually turn fixtures on or off, as desired. Energy savings results from only operating lighting systems when they are required.

Occupancy sensors may be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. In general, wall switch replacement sensors are recommended for single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in locations without local switching or where wall switches are not in the line-of-sight of the main work area and in large spaces. We recommend a comprehensive approach to lighting design that upgrades both the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 6: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
24,972	5.6	0.0	$3,061.74	$21,640.00	$420.00	$21,220.00	6.9	25,146

Measure Description

We recommend installing 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. Typical areas for such lighting control are stairwells, interior corridors, parking lots, and parking garages.

Lighting fixtures with these controls operate at default low levels when the area is not occupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. The lighting systems are switched to full lighting levels whenever an occupant is detected. Fixtures are automatically switched back to low level after an area has been vacant for a preset period of time. Energy savings results from only providing full lighting levels when it is required.

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

Additional savings from reduced lighting maintenance may also result from this measure, due to reduced lamp operation.

4.1.3 HVAC System Upgrades

Our recommendations for HVAC system improvements are summarized in Figure 19 below.

Figure 19 - Summary of HVAC System Improvement ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**82,775**	**16.6**	**86.4**	**$10,911.20**	**$23,992.86**	**$2,750.00**	**$21,242.86**	**1.9**	**93,475**
ECM 7	Install Dual Enthalpy Outside Economizer Control	73,871	16.6	0.0	$9,057.18	$12,900.00	$2,750.00	$10,150.00	1.1	74,387
ECM 8	Implement Demand Control Ventilation	8,905	0.0	74.0	$1,744.56	$10,875.36	$0.00	$10,875.36	6.2	17,634
ECM 9	Install Pipe Insulation	0	0.0	12.4	$109.46	$217.50	$0.00	$217.50	2.0	1,453

ECM 7: Install Dual-Enthalpy Economizers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
73,871	16.6	0.0	$9,057.18	$12,900.00	$2,750.00	$10,150.00	1.1	74,387

Measure Description

Dual enthalpy economizers are used to control a ventilation system's outside air intake in order to reduce a facility's total cooling load. A dual-enthalpy economizer monitors the air temperature and humidity of both the outside and return air. The control supplies the lowest energy (temperature and humidity) air to the air handling system. When outside air conditions allow, outside air can be used for cooling instead of running the air handling system's compressor. This reduces the demand on the cooling system, lowering its usage hours and saving energy.

Savings result from using outside air instead of mechanical cooling when outside air conditions permit.

ECM 8: Implement Demand Control Ventilation (DCV)

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
8,905	0.0	74.0	$1,744.56	$10,875.36	$0.00	$10,875.36	6.2	17,634

Measure Description

Demand control ventilation (DCV) monitors indoor air CO_2 content to measure room occupancy. This data is used to regulate the amount of outdoor provided to the space for ventilation. In order to ensure adequate air quality, standard ventilation systems often provide outside air based on a space's estimated maximum occupancy. However, during low occupancy periods, the space may be over ventilated. This wastes energy through excessive fan more usage and additional cost to heat and cool the excessive air flow. DCV reduces unnecessary outdoor air intake by regulating ventilation based on actual occupancy levels, saving significant amounts of energy. DCV is most suited for facilities where occupancy levels vary significantly hour to hour and day to day.

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

ECM 9: Install Pipe Insulation

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	12.4	$109.46	$217.50	$0.00	$217.50	2.0	1,453

Measure Description

We recommend installing insulation on heating system piping. Distribution system losses are dependent on heating water system temperature, the size of the distribution system, and the level of insulation of the piping. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is exposed to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated system efficiency can be significantly reduced.

This measure saves energy by reducing heat losses from the heating distribution system.

4.1.4 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 20 below.

Figure 20 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**92.4**	**$814.46**	**$415.86**	**$0.00**	**$415.86**	**0.5**	**10,815**
ECM 10	Install Low-Flow Domestic Hot Water Devices	0	0.0	92.4	$814.46	$415.86	$0.00	$415.86	0.5	10,815

ECM 10: Install Low-Flow DHW Devices

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	92.4	$814.46	$415.86	$0.00	$415.86	0.5	10,815

Measure Description

We recommend installing low-flow domestic hot water devices to reduce overall hot water demand. Energy demand from domestic hot water heating systems can be reduced by reducing water usage in general. Faucet aerators can reduce hot water usage, relative to standard aerators, which saves energy.

Low-flow devices reduce the overall water flow from the fixture, while still adequate pressure for washing. This reduces the amount of water used per day resulting in energy and water savings.

4.1.5 Food Service Equipment & Refrigeration Measures

Our recommendations for food service and refrigeration measures are summarized in Figure 21 below.

Figure 21 - Summary of Food Service Equipment & Refrigeration ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Food Service Equipment & Refrigeration Measures		**1,173**	**0.0**	**0.0**	**$143.77**	**$1,037.21**	**$100.00**	**$937.21**	**6.5**	**1,181**
ECM 11	Refrigeration Controls	1,173	0.0	0.0	$143.77	$1,037.21	$100.00	$937.21	6.5	1,181

ECM 11: Walk-In Cooler & Freezer Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,173	0.0	0.0	$143.77	$1,037.21	$100.00	$937.21	6.5	1,181

Measure Description

We recommend the installation of additional controls to optimize the operation of the walk-in freezers.

Many walk-in 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 accomplished 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, reducing annual energy consumption. This measure is applicable to existing evaporator fans with a traditional electric defrost mechanism.

Many walk-in freezers have evaporator fans which run continuously. The measure adds a control system feature to automatically shut off evaporator fans when the cooler's thermostat is not calling for cooling.

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.

4.1.6 Plug Load Equipment Control - Vending Machines

Our recommendations for plug load equipment control measures are summarized in Figure 22 below.

Figure 22-Summary of Plug Load Equipment Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		**3,566**	**0.0**	**0.0**	**$437.25**	**$690.00**	**$0.00**	**$690.00**	**1.6**	**3,591**
ECM 12	Vending Machine Control	3,566	0.0	0.0	$437.25	$690.00	$0.00	$690.00	1.6	3,591

ECM 12: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
3,566	0.0	0.0	$437.25	$690.00	$0.00	$690.00	1.6	3,591

Measure Description

Vending machines operate continuously, even during non-business hours. It is recommended to install occupancy sensor controls to reduce the energy use. These controls power down vending machines when the vending machine area has been vacant for some time, then power up at regular intervals, as needed, to turn machine lights on or keep the product cool. Energy savings are a dependent on vending machine and activity level in the area surrounding the machines.

4.2 ECMs Evaluated but Not Recommended

The measures below have been evaluated by the auditor but are not recommended for implementation at the facility. Reasons for exclusion can be found in each measure description section. However, as some of the equipment have passed their useful service life, also taking into consideration the operation and maintenance costs, it is likely in the best interest of the school district to replace them prior to a catastrophic failure.

Figure 23 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures	**29,218**	**17.3**	**0.0**	**$3,582.38**	**$971,432.90**	**$10,355.50**	**$961,077.40**	**268.3**	**29,422**
Install High Efficiency Electric AC	29,218	17.3	0.0	$3,582.38	$971,432.90	$10,355.50	$961,077.40	268.3	29,422
Gas Heating (HVAC/Process) Replacement	**0**	**0.0**	**1,289.8**	**$11,373.69**	**$377,010.94**	**$26,699.20**	**$350,311.74**	**30.8**	**151,021**
Install High Efficiency Hot Water Boilers	0	0.0	759.6	$6,698.60	$243,298.69	$22,299.20	$220,999.49	33.0	88,945
Install High Efficiency Furnaces	0	0.0	530.2	$4,675.10	$133,712.25	$4,400.00	$129,312.25	27.7	62,076
TOTALS	**29,218**	**17.3**	**1,289.8**	**$14,956.07**	**$1,348,443.84**	**$37,054.70**	**$1,311,389.14**	**87.7**	**180,443**

* - All incentives presented in this table are based on NJ Smart Start Building 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).

Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
29,218	17.3	0.0	$3,582.38	$971,432.90	$10,355.50	$961,077.40	268.3	29,422

Measure Description

We recommend replacing standard efficiency packaged and split system air conditioning units with high efficiency packaged and split systems air conditioning units. There have been significant improvements in both compressor and fan motor efficiencies over the past several years. Therefore, electricity savings can be achieved by replacing older units with new high efficiency units. A higher EER or SEER rating indicates a more efficient cooling system. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling load, and the estimated annual operating hours.

Reasons for not Recommending

Although the school showed interest in implementing this measure, due to the long payback period, it is not recommended on the basis of energy savings alone. We recommend that high efficiency units be considered when unit replacement is being considered for maintenance reason or recapitalization. Packaged AC units at this site are equipped with gas fired furnaces, therefore, this measure can be implemented in conjunction with the gas furnace replacement measure, potentially at a lower overall cost than has been conservatively estimated.

Install High Efficiency Hot Water Boilers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	759.6	$6,698.60	$243,298.69	$22,299.20	$220,999.49	33.0	88,945

Measure Description

We recommend replacing older inefficient hot water boilers with high efficiency hot water boilers. Significant improvements have been made in combustion technology resulting in increased overall boiler efficiency. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

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

Reasons for not Recommending

The simple payback of this measure exceeds the expected useful life of the equipment and is therefore not recommended on the basis of energy savings alone.

Install High Efficiency Furnaces

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	530.2	$4,675.10	$133,712.25	$4,400.00	$129,312.25	27.7	62,076

Measure Description

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

Reasons for not Recommending

The simple payback of this measure exceeds the expected useful life of the equipment and is therefore not recommended on the basis of energy savings alone.

5 ENERGY EFFICIENT PRACTICES

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through application of many low cost or no-cost energy efficiency strategies. By employing certain behavioral and operational changes and performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and energy and O&M costs can be reduced. The recommendations below are provided as a framework for developing a whole building maintenance plan that is customized to your facility. Consult with qualified equipment specialists for details on proper maintenance and system operation.

Close Doors and Windows

Ensure doors and windows are closed in conditioned spaces. Leaving doors and windows open leads to a significant increase in heat transfer between conditioned spaces and the outside air. Reducing a facility's air changes per hour (ACH) can lead to increased occupant comfort as well as significant heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

Use Window Treatments/Coverings

A substantial amount of heat gain can occur through uncovered or untreated windows, especially older single pane windows and east or west-facing windows. Treatments such as high-reflectivity films or covering windows with shades or shutters can reduce solar heat gain and, consequently, cooling load and can reduce internal heat loss and the associated heating load.

Develop a Lighting Maintenance Schedule

In addition to routine fixture cleaning, development of a maintenance schedule can both ensure maintenance is performed regularly and can reduce the overall cost of fixture re-lamping and re-ballasting. By re-lamping and re-ballasting fixtures in groups, lighting levels are better maintained and the number of site visits by a lighting technician or contractor can be minimized, decreasing the overall cost of maintenance.

Ensure Lighting Controls Are Operating Properly

Lighting controls are very cost effective energy efficient devices, when installed and operating correctly. As part of a lighting maintenance schedule, lighting controls should be tested annually to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight sensors, maintenance involves cleaning of sensor lenses and confirming setpoints and sensitivity are appropriately configured.

Perform Routine Motor Maintenance

Motors consist of many moving parts whose collective degradation can contribute to a significant loss of motor efficiency. In order to prevent damage to motor components, routine maintenance should be performed. This maintenance consists of 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.

Practice Proper Use of Thermostat Schedules and Temperature Resets

Ensure thermostats are correctly set back. By employing proper set back temperatures and schedules, facility heating and cooling costs can be reduced dramatically during periods of low or no occupancy. As such, 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 further 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.

Ensure Economizers are Functioning Properly

Economizers, when properly configured, can be used to significantly reduce mechanical cooling. However, if the outdoor thermostat or enthalpy control is malfunctioning or the damper is stuck or improperly adjusted, benefits from the economizer may not be fully realized. As such, periodic inspection and maintenance is required to ensure proper operation. This maintenance should be scheduled with maintenance of the facility's air conditioning system and 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. A malfunctioning economizer can significantly increase the amount of heating and mechanical cooling required by introducing excess amounts of cold or hot outside air.

Clean Evaporator/Condenser Coils on AC Systems

Dirty evaporators and condensers coils cause a restriction to air flow and restrict heat transfer. This results in increased evaporator and condenser fan load and a decrease in cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

Perform Proper Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to retain proper functionality and efficiency of the heating system. Fuel burning equipment should undergo yearly tune-ups to ensure they are operating as safely and efficiently as possible from a combustion standpoint. A tune-up should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Buildup of dirt, dust, or deposits on the internal surfaces of a boiler can greatly affect its heat transfer efficiency. These deposits can accumulate on the water side or fire side of the boiler. Boilers should be cleaned regularly according to the manufacturer's instructions to remove this build up in order to sustain efficiency and equipment life.

Perform Proper Furnace Maintenance

Preventative furnace 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 include tasks such as checking for gas / carbon monoxide leaks; changing the air and fuel filters; checking components for cracks, corrosion, dirt, or debris build-up; ensuring the ignition system is working properly; testing and adjusting operation and safety controls; inspecting the electrical connections; and ensuring proper lubrication for motors and bearings.

Plug Load Controls

There are a variety of ways to limit the energy use of plug loads including increasing occupant awareness, removing under-utilized equipment, installing hardware controls, and using software controls. Some control steps to take are to enable the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips. For additional information refer to "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

Water Conservation

Installing low-flow faucets or faucet aerators, low-flow showerheads, and kitchen sink pre-rinse spray valves saves both energy and water. These devices save energy by reducing the overall amount of hot water used hence reducing the energy used to heat the water. The flow ratings for EPA WaterSense™ (http://www3.epa.gov/watersense/products) labeled devices are 1.5 gpm for bathroom faucets, 2.0 gpm for showerheads, and 1.28 gpm for pre-rinse spray valves.

Installing dual flush or low-flow toilets and low-flow or waterless urinals are additional ways to reduce the sites water use, however, these devices do not provide energy savings at the site level. 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. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and toilets that use as little as 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

Refer to Section 4.1.4 for any low-flow ECM recommendations.

Re-Insulate Evaporator Refrigerant Lines in RTUs & DX Units

During the site visit, it was observed that most of the insulation on the evaporator refrigerant lines serving RTUs & DX units on the roof were either partially or completely missing. Due to lack of insulation, the refrigerant liquid going from condenser to evaporator picks up excess heat before reaching the evaporator. This means that more energy is consumed by the system to reject the additional heat picked up by the uninsulated refrigerant line.

It is recommended to re-insulate the exposed evaporator refrigerant lines in these units. This would help achieve significant energy savings.

6 On-Site Generation Measures

On-site generation measure options include both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) on-site technologies that generate power to meet all or a portion of the electric energy needs of a facility, often repurposing any waste heat where applicable. Also referred to as distributed generation, these systems contribute to Greenhouse Gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, resulting in the electric system reliability through improved transmission and distribution system utilization.

The State of New Jersey's Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines a goal of 70% of the State's electrical needs to be met by renewable sources by 2050.

Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at 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.

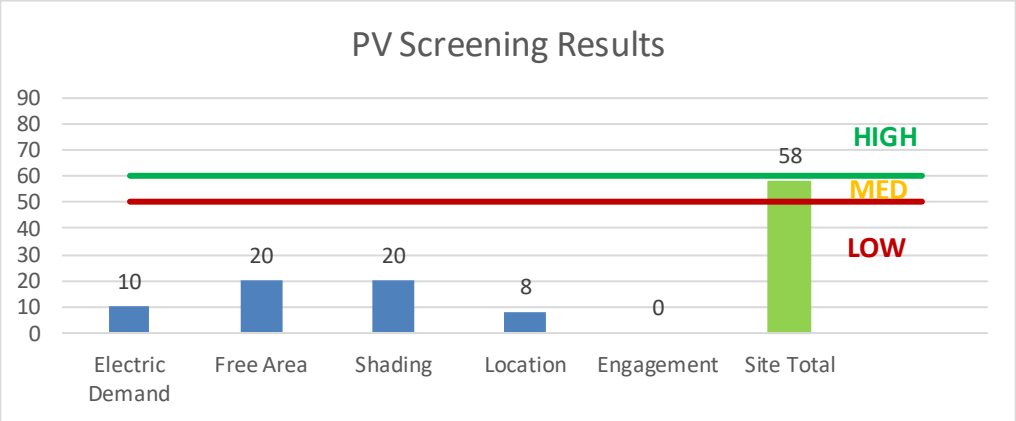
6.1 Photovoltaic

Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility's electrical distribution system. The amount of unobstructed area available determines how large of a solar array can be installed. The size of the array combined with the orientation, tilt, and shading elements determines the energy produced.

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

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the potential for PV at the site. A PV array located on the roof of the main building/ground next to the building may be feasible. If Ramapo Indian Hills HSD - Ramapo High School is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 24 - Photovoltaic Screening



Potential	Medium	
System Potential	581	kW DC STC
Electric Generation	692,186	kWh/yr
Displaced Cost	$60,220	/yr
Installed Cost	$2,265,900	

Solar projects must register their projects in the SREC (Solar Renewable Energy Certificate) Registration Program (SRP) prior to the start of construction in order 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 developed new solar projects and insight into future SREC pricing. Refer to Section 8.3 for additional information.

For more information on solar PV technology and commercial solar markets in New Jersey, or to find a qualified solar installer, who can provide a more detailed assessment of the specific costs and benefits of solar develop of the site, please visit the following links below:

- **Basic Info on Solar PV in NJ**: http://www.njcleanenergy.com/whysolar
- **NJ Solar Market FAQs**: http://www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs
- **Approved Solar Installers in the NJ Market**: http://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) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric generation from a CHP system is typically interconnected to local power distribution systems. Heat is recovered from exhaust and ancillary cooling systems and interconnected to the existing hot water (or steam) distribution systems.

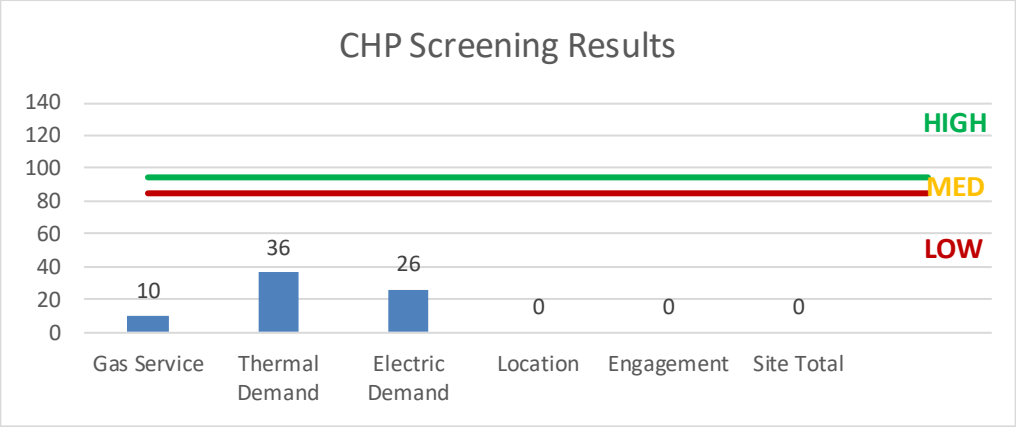
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for the purpose of space cooling. The key criteria used for screening, however, is the amount of time the system operates at full load and the facility's ability to use the recovered heat. Facilities with continuous use 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 a Low potential for installing a cost-effective CHP system.

Low or infrequent thermal load, and lack of space near the existing boilers are the most significant factors contributing to the low potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

For a list of qualified firms in New Jersey specializing in commercial CHP cost assessment and installation, go to: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

Figure 25 - Combined Heat and Power Screening



7 DEMAND RESPONSE

Demand Response (DR) is a program designed to reduce the electric load of commercial facilities when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability.

By enabling grid operators to call upon Curtailment Service Providers and commercial facilities to reduce electric usage 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 DR programs. Program participation is voluntary and participants receive payments whether or not their facility is called upon to curtail their electric usage.

Typically an electric customer needs to be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with a greater capability to quickly curtail their demand during peak hours will receive higher payments. Customers with back-up generators onsite may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in a DR programs often find it to be a valuable source of revenue for their facility because the payments can significantly offset annual electric costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature set points on thermostats, so that air conditioning units run less frequently, or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR curtailment event. DR program participants may need to install smart meters or may need to also sub-meter larger energy-using equipment, such as chillers, in order to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a demand response activity in most situations.

The first step toward participation in a DR program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (http://www.pjm.com/markets-and-operations/demand-response/csps.aspx). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (http://www.pjm.com/training/training%20material.aspx), along with a variety of other DR program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding program rules and requirements for metering and controls, assess a facility's ability to temporarily reduce electric load, and provide details on payments to be expected for participation in the program. Providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

Typically, this program is not recommended for schools. but if the facility is interested, we recommend you reach out to a Curtailment Service Provider for more details on this program.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey's Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 26 for a list of the eligible programs identified for each recommended ECM.

Figure 26 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
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 LED Exit Signs						
ECM 5	Install Occupancy Sensor Lighting Controls	X					
ECM 6	Install High/Low Lighitng Controls						
ECM 7	Install Dual Enthalpy Outside Economizer Control	X					
ECM 8	Implement Demand Control Ventilation						
ECM 9	Install Pipe Insulation						
ECM 10	Install Low-Flow Domestic Hot Water Devices						
ECM 11	Refrigeration Controls	X					
ECM 12	Vending Machine Control						

SmartStart is generally well-suited for implementation of individual measures or small group of measures. It provides flexibility to install measures at your own pace using in-house staff or a preferred contractor. Direct Install caters to small to mid-size facilities that can bundle multiple ECMs together. This can greatly simplify participation and may lead to higher incentive amounts, but requires the use of pre-approved contractors. The Pay for Performance (P4P) program is a "whole-building" energy improvement program designed for larger facilities. It requires implementation of multiple measures meeting minimum savings thresholds, as well as use of pre-approved consultants. The Large Energy Users Program (LEUP) is available to New Jersey's largest energy users giving them flexibility to install as little or as many measures, in a single facility or several facilities, with incentives capped based on the entity's annual energy consumption. LEUP applicants can use in-house staff or a preferred contractor.

Generally, the incentive values provided throughout the report assume the SmartStart program is utilized because it provides a consistent basis for comparison of available incentives for various measures, though in many cases incentive amounts may be higher through participation in other programs.

Brief descriptions of all relevant financing and incentive programs are located in the sections below. Further information, including most current program availability, requirements, and incentive levels can be found at: www.njcleanenergy.com/ci.

8.1 SmartStart

Overview

The SmartStart program offers incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program 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

Most equipment sizes and types are served by this program. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades.

Incentives

The SmartStart prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SmartStart program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

Since your facility is an existing building, only the retrofit incentives have been applied in this report. Custom measure incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings, 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

To participate in the SmartStart program you will need to submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. Applicants may work with a contractor of their choosing and can also utilize internal personnel, which provides added flexibility to the program. Using internal personnel also helps improve the economics of the ECM by reducing the labor cost that is included in the tables in this report.

Detailed program descriptions, instructions for applying and applications can be found at: www.njcleanenergy.com/SSB.

8.2 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SRP prior to the start of construction in order 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 RPS. One way they can meet the RPS requirements is by purchasing SRECs. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period can and will fluctuate depending on supply and demand.

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

8.3 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) is an alternate method for New Jersey's government agencies to finance the implementation of energy conservation measures. 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. This is done in a manner that ensures that annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive in year one, and every year thereafter. 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 can be leveraged to help further reduce the total project cost of eligible measures.

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 utilized 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. Entities should carefully consider all alternatives to develop an approach that best meets their needs. A detailed program descriptions and application can be found at: www.njcleanenergy.com/ESIP.

Please note that ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you may utilize NJCEP incentive programs to help further reduce costs when developing the ESP. You should refer to the ESIP guidelines at the link above for further information and guidance on next steps.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law deregulated the retail electric markets, allowing all consumers to shop for service from competitive electric suppliers. The intent was to create a more competitive market for electric power supply in New Jersey. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third-party (i.e. non-utility) energy supplier.

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 is purchasing electricity from a third-party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third-party electric suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

9.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey has also been deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate on a monthly basis. 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 is typically dependent upon whether a customer seeks 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 is not purchasing natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility is purchasing natural gas from a third-party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third-party natural gas suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.27	446	0.0	$54.68	$905.15	$170.00	13.44
Boiler Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	651	0.24	393	0.0	$48.12	$635.15	$135.00	10.39
Boiler Room	2	Metal Halide: (1) 250W Lamp	Wall Switch	295	2,604	Fixture Replacement	Yes	2	LED - Fixtures: Wall Sconces	Occupancy Sensor	89	1,823	0.31	1,396	0.0	$171.14	$723.19	$55.00	3.90
Boiler Room	2	Exit Signs: Fluorescent	None	15	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	181	0.0	$22.23	$144.83	$0.00	6.51
Storage Room	2	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	Yes	2	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	651	0.12	191	0.0	$23.47	$304.45	$45.00	11.05
Storage Room	2	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	930	Relamp	No	2	LED Screw-In Lamps: (1) 16W LED Lamp Screw-In	Wall Switch	16	930	0.01	15	0.0	$1.84	$34.45	$10.00	13.32
Satirwell Boilers	1	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	2,604	Relamp	No	1	LED Screw-In Lamps: (1) 16W LED Lamp Screw-In	Wall Switch	16	2,604	0.00	21	0.0	$2.57	$17.23	$0.00	6.70
Satirwell Boilers	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,604	0.04	168	0.0	$20.56	$73.03	$20.00	2.58
700 Wing Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	930	0.04	60	0.0	$7.34	$73.03	$20.00	7.22
700 Wing Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.02	35	0.0	$4.33	$36.52	$10.00	6.13
Room 614	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
Room 613E	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
900 Wing Hallway	12	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	12	LED Screw-In Lamps: (2) 18W LED Lamp 4-Pin	High/Low Control	36	1,823	0.21	963	0.0	$118.08	$1,052.32	$0.00	8.91
900 Wing Hallway	17	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	17	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	0.70	3,184	0.0	$390.42	$1,531.13	$255.00	3.27
900 Wing Hallway	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Upper Gym	1	Exit Signs: Fluorescent	None	15	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	91	0.0	$11.12	$72.42	$0.00	6.51
Upper Gym	7	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	7	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Upper Gym	40	LED - Fixtures: (1) 165W LED Fixture	Wall Switch	165	2,604	None	Yes	40	LED - Fixtures: (1) 165W LED Fixture	Occupancy Sensor	165	1,823	1.30	5,929	0.0	$726.98	$270.00	$35.00	0.32
Gym Entrance	17	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	17	LED Screw-In Lamps: (2) 18W LED Lamp 4-Pin	Occupancy Sensor	36	1,823	0.30	1,364	0.0	$167.28	$1,734.12	$0.00	10.37
Gym Entrance	9	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	930	Relamp	Yes	9	LED Screw-In Lamps: (1) 16W LED Lamp Screw-In	Occupancy Sensor	16	651	0.07	114	0.0	$13.93	$695.03	$0.00	49.91
Gym Entrance	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.33	1,498	0.0	$183.73	$978.18	$120.00	4.67
Gym Entrance	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Office Hallway	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	22	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	0.90	4,121	0.0	$505.25	$2,005.00	$330.00	3.32
Main Office Hallway	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Entrance	28	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	28	LED Screw-In Lamps: (2) 18W LED Lamp 4-Pin	Occupancy Sensor	36	1,823	0.49	2,247	0.0	$275.52	$2,872.08	$0.00	10.42

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Main Entrance	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Entrance	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.41	1,873	0.0	$229.66	$1,087.73	$150.00	4.08
Main Hallway	10	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	10	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,823	0.25	1,165	0.0	$142.83	$1,124.60	$0.00	7.87
Main Hallway	11	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	11	LED Screw-In Lamps: (2) 18W LED Lamp 4-Pin	High/Low Control	36	1,823	0.19	883	0.0	$108.24	$997.96	$0.00	9.22
Main Hallway	19	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	19	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	651	0.78	1,271	0.0	$155.84	$1,840.68	$285.00	9.98
Main Hallway	1	Exit Signs: Fluorescent	None	15	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	91	0.0	$11.12	$72.42	$0.00	6.51
200 Wing Hallway	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,604	Relamp	Yes	4	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	1,823	0.06	253	0.0	$30.99	$330.06	$40.00	9.36
200 Wing Hallway	19	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	19	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	0.78	3,559	0.0	$436.36	$1,840.68	$285.00	3.57
200 Wing Hallway	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
400 Wing (Auditorium) Hallway	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	36	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	1.48	6,743	0.0	$826.78	$3,171.81	$540.00	3.18
400 Wing (Auditorium) Hallway	8	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	8	LED Screw-In Lamps: (2) 18W LED Lamp 4-Pin	High/Low Control	36	1,823	0.14	642	0.0	$78.72	$834.88	$0.00	10.61
400 Wing (Auditorium) Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
400 Wing Hallway	26	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	26	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	1.07	4,870	0.0	$597.12	$2,424.09	$390.00	3.41
400 Wing Hallway	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Front Hallway	16	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	16	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,823	0.41	1,864	0.0	$228.52	$1,759.36	$0.00	7.70
Front Hallway	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Front Hallway	8	Compact Fluorescent: (1) 26W CFL - 4-Pin	Wall Switch	26	2,604	Relamp	Yes	8	LED Screw-In Lamps: (1) 16W LED Lamp 4-Pin	High/Low Control	16	1,823	0.08	355	0.0	$43.47	$617.44	$0.00	14.20
100 Wing Hallway	27	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	27	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	1.11	5,057	0.0	$620.08	$2,478.86	$405.00	3.34
100 Wing Hallway	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
100 Wing Hallway	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,604	0.04	168	0.0	$20.56	$73.03	$20.00	2.58
100 Wing Hallway	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,604	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,604	0.02	96	0.0	$11.75	$65.03	$20.00	3.83
100 Wing Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
700 Wing Hallway	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
700 Wing Hallway	20	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	20	LED Screw-In Lamps: (2) 18W LED Lamp 4-Pin	High/Low Control	36	1,823	0.35	1,605	0.0	$196.80	$1,887.20	$0.00	9.59
700 Wing Hallway	38	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	38	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	1.56	7,118	0.0	$872.71	$3,481.36	$570.00	3.34

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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
700 Wing Hallway	10	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	10	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,823	0.25	1,165	0.0	$142.83	$1,124.60	$0.00	7.87
300 Wing Hallway	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	0.66	2,997	0.0	$367.46	$1,476.36	$240.00	3.36
300 Wing Hallway	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,823	0.08	349	0.0	$42.85	$417.38	$0.00	9.74
300 Wing Hallway	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
300 Wing Hallway	14	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,604	Relamp	Yes	14	LED - Linear Tubes: (2) 2' Lamps	High/Low Control	17	1,823	0.19	885	0.0	$108.46	$1,055.21	$140.00	8.44
300 Wing Hallway	14	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	2,604	Relamp	Yes	14	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	1,823	0.32	1,474	0.0	$180.68	$1,282.82	$210.00	5.94
Room 112	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,432	0.25	883	0.0	$108.27	$868.64	$160.00	6.55
Room 112	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room110	33	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	Yes	33	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,432	0.90	3,238	0.0	$396.99	$2,825.00	$540.00	5.76
Room110	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 117	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	Yes	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,432	0.74	2,649	0.0	$324.81	$2,335.91	$445.00	5.82
Room 115	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.16	268	0.0	$32.81	$489.09	$95.00	12.01
Room 113	27	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	27	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	1.11	3,974	0.0	$487.21	$2,828.86	$580.00	4.62
Room 110A	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	930	0.03	53	0.0	$6.49	$54.77	$15.00	6.13
Room 110A	3	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	930	Relamp	Yes	3	LED Screw-In Lamps: (2) 18W LED Lamp 4-Pin	Occupancy Sensor	36	651	0.05	86	0.0	$10.54	$433.08	$0.00	41.08
Room 110A	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Custodian Closet	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	930	0.02	31	0.0	$3.80	$72.46	$0.00	19.05
Room 111	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	0.98	3,532	0.0	$433.08	$2,394.54	$500.00	4.37
Room 109	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	0.62	2,208	0.0	$270.67	$1,631.59	$330.00	4.81
Room 109	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	930	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	651	0.44	724	0.0	$88.78	$861.82	$135.00	8.19
Room 109A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.16	268	0.0	$32.81	$489.09	$95.00	12.01
Room 109A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.11	178	0.0	$21.87	$416.06	$75.00	15.59
Faculty Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.16	749	0.0	$91.86	$489.09	$60.00	4.67
Room 108A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.11	499	0.0	$61.24	$416.06	$75.00	5.57
Room 108	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.86	3,934	0.0	$482.29	$2,230.22	$455.00	3.68

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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 107	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.86	3,934	0.0	$482.29	$2,230.22	$455.00	3.68
Room 150	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.86	3,934	0.0	$482.29	$2,230.22	$455.00	3.68
Room 150B	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.08	375	0.0	$45.93	$379.55	$65.00	6.85
Room 106	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.86	3,934	0.0	$482.29	$2,230.22	$455.00	3.68
Grass Hallway	10	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	10	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,823	0.25	1,165	0.0	$142.83	$1,124.60	$0.00	7.87
600 Wing Hallway	42	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	2,604	Relamp	Yes	42	LED - Linear Tubes: (4) 2' Lamps	High/Low Control	34	1,823	1.08	4,930	0.0	$604.50	$4,131.26	$840.00	5.44
600 Wing Hallway	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
600 Wing Hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	0.12	562	0.0	$68.90	$364.32	$45.00	4.63
Room 703A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
Room 706	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	1.23	2,007	0.0	$246.07	$2,993.18	$625.00	9.62
Room 708	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.25	401	0.0	$49.21	$598.64	$125.00	9.62
Room 708A	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.49	803	0.0	$98.43	$1,197.27	$250.00	9.62
Room 710	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	1.23	2,007	0.0	$246.07	$2,993.18	$625.00	9.62
Room 712	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	1.23	2,007	0.0	$246.07	$2,993.18	$625.00	9.62
Room 714	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.74	1,204	0.0	$147.64	$1,795.91	$375.00	9.62
Room 717	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.12	201	0.0	$24.61	$434.32	$80.00	14.40
Room 716	30	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	30	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	1.23	2,007	0.0	$246.07	$2,993.18	$625.00	9.62
Room 719	35	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	35	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	1.44	2,341	0.0	$287.08	$3,537.04	$735.00	9.76
Room 721	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	0.21	736	0.0	$90.22	$543.86	$110.00	4.81
Room 723	35	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	35	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	1.44	2,341	0.0	$287.08	$3,537.04	$735.00	9.76
Room 718	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.82	1,338	0.0	$164.04	$2,175.45	$440.00	10.58
Room 720	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.82	1,338	0.0	$164.04	$2,175.45	$440.00	10.58
Girls Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.16	749	0.0	$91.86	$489.09	$60.00	4.67
Boys Restroom	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.16	749	0.0	$91.86	$489.09	$60.00	4.67
Room 705	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	36	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	1.48	2,408	0.0	$295.28	$3,591.81	$750.00	9.62

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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 707	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.16	268	0.0	$32.81	$489.09	$95.00	12.01
Room 709	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	36	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	1.48	2,408	0.0	$295.28	$3,591.81	$750.00	9.62
Restroom	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	930	0.04	62	0.0	$7.61	$144.92	$0.00	19.05
Room 711	19	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	19	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	0.78	2,796	0.0	$342.85	$2,120.68	$425.00	4.95
Room 711A	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	0.12	442	0.0	$54.13	$434.32	$80.00	6.55
Room 702 Multimedia Lab	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.82	3,746	0.0	$459.32	$2,175.45	$440.00	3.78
Room 701	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.62	2,810	0.0	$344.49	$1,631.59	$330.00	3.78
Room 704	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.12	562	0.0	$68.90	$434.32	$80.00	5.14
Room 704	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.02	87	0.0	$10.65	$72.46	$0.00	6.81
Room 704C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.08	375	0.0	$45.93	$379.55	$65.00	6.85
Room 704B	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.16	749	0.0	$91.86	$489.09	$95.00	4.29
Room 704A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.16	749	0.0	$91.86	$489.09	$95.00	4.29
Room 703	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
Room 106A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.11	178	0.0	$21.87	$416.06	$75.00	15.59
Room 104	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 103	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 102	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 101	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.14	659	0.0	$80.85	$489.09	$60.00	5.31
Girls Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.10	440	0.0	$53.90	$416.06	$40.00	6.98
032 Faculty Cafeteria	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.57	2,622	0.0	$321.53	$1,846.82	$210.00	5.09
020 Cafeteria	9	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,604	None	No	9	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,604	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
020 Cafeteria	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.33	1,498	0.0	$183.73	$978.18	$120.00	4.67
020 Cafeteria	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
020 Cafeteria	46	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	46	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	1.26	5,744	0.0	$704.29	$3,839.69	$460.00	4.80

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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
Kitchen	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,432	0.41	1,472	0.0	$180.45	$817.73	$150.00	3.70
Kitchen	17	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	2,046	Relamp	Yes	17	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	1,432	0.44	1,568	0.0	$192.25	$1,375.51	$340.00	5.39
Kitchen	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	6	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	2,046	Relamp	Yes	6	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	1,432	0.35	1,264	0.0	$154.92	$373.35	$30.00	2.22
Room 020A (Dishwasher Room)	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,432	0.08	294	0.0	$36.09	$379.55	$65.00	8.72
Room 020A (Dishwasher Room)	2	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	2,046	Relamp	Yes	2	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	1,432	0.12	421	0.0	$51.64	$304.45	$45.00	5.02
Room 020A (Dishwasher Room)	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,432	0.11	392	0.0	$48.12	$416.06	$75.00	7.09
Kitchen Hood	6	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	2,046	Relamp	No	6	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	16	2,046	0.03	99	0.0	$12.12	$103.35	$0.00	8.53
Room 020A (Dishwasher Room)	2	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	2,046	Relamp	No	2	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	16	2,046	0.01	33	0.0	$4.04	$34.45	$10.00	6.05
Room 020C	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,046	0.02	78	0.0	$9.52	$36.52	$10.00	2.79
Room 020D	2	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	2,046	Relamp	Yes	2	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	1,432	0.12	421	0.0	$51.64	$304.45	$45.00	5.02
Room 200	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	930	0.04	60	0.0	$7.34	$73.03	$20.00	7.22
Room 201	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	651	None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	651	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 203A	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	651	None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	651	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Faculty Restroom	1	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	651	None	No	1	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	651	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 203	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	651	None	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	651	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Women Faculty Restroom	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	651	None	No	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	651	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 205	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	651	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	456	0.25	281	0.0	$34.45	$598.64	$125.00	13.75
Room 207 Library	27	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	27	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	36	1,823	0.47	2,167	0.0	$265.68	$2,817.72	$175.00	9.95
Room 207 Library	46	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,604	Relamp	Yes	46	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,823	0.64	2,907	0.0	$356.37	$3,655.69	$740.00	8.18
Room 207 Library	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 207 Library	18	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	2,604	Relamp	Yes	18	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	16	1,823	0.14	636	0.0	$77.99	$1,120.05	$195.00	11.86
Room 207 Library	49	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	49	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	1.34	6,119	0.0	$750.23	$3,949.24	$770.00	4.24
Room 207B	36	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	36	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.48	6,743	0.0	$826.78	$3,591.81	$750.00	3.44
Room 207B	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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 207A	4	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	4	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	36	1,823	0.07	321	0.0	$39.36	$487.44	$35.00	11.49
Room 207A	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.33	1,498	0.0	$183.73	$978.18	$190.00	4.29
Room 210 Server Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.16	749	0.0	$91.86	$489.09	$95.00	4.29
Room 209	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.11	499	0.0	$61.24	$416.06	$75.00	5.57
Room 209	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.25	1,124	0.0	$137.80	$598.64	$125.00	3.44
Room 211	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.98	4,495	0.0	$551.19	$2,394.54	$500.00	3.44
Faculty Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.10	440	0.0	$53.90	$416.06	$40.00	6.98
Faculty Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.02	99	0.0	$12.12	$36.52	$10.00	2.19
Women Faculty Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.02	99	0.0	$12.12	$36.52	$10.00	2.19
Women Faculty Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.10	440	0.0	$53.90	$416.06	$40.00	6.98
Room 212	18	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	18	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.87	3,956	0.0	$485.10	$2,124.54	$465.00	3.42
Room 213	18	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	18	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.87	3,956	0.0	$485.10	$2,124.54	$465.00	3.42
Room 214	18	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	18	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.87	3,956	0.0	$485.10	$2,124.54	$465.00	3.42
Room 215	25	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,823	None	Yes	25	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,276	0.07	228	0.0	$27.95	$270.00	$35.00	8.41
Room 217	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.98	4,495	0.0	$551.19	$2,394.54	$500.00	3.44
Room 217B	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.16	749	0.0	$91.86	$489.09	$95.00	4.29
Room 216	27	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	27	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.11	5,057	0.0	$620.08	$2,828.86	$580.00	3.63
Boys Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.10	440	0.0	$53.90	$416.06	$40.00	6.98
Custodian Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.10	440	0.0	$53.90	$416.06	$40.00	6.98
Server Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.11	178	0.0	$21.87	$416.06	$75.00	15.59
Room 302A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.11	499	0.0	$61.24	$416.06	$75.00	5.57
Room 218	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.55	2,497	0.0	$306.21	$1,810.30	$340.00	4.80
Room 219	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.27	1,249	0.0	$153.11	$905.15	$170.00	4.80
Room 220	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.55	2,497	0.0	$306.21	$1,810.30	$340.00	4.80
Room 221	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.55	2,497	0.0	$306.21	$1,810.30	$340.00	4.80

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 213	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.55	2,497	0.0	$306.21	$1,810.30	$340.00	4.80
Room 222	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.55	2,497	0.0	$306.21	$1,810.30	$340.00	4.80
Room 222A	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	930	0.04	60	0.0	$7.34	$73.03	$20.00	7.22
Room 222A	1	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	930	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	16	930	0.00	7	0.0	$0.92	$17.23	$0.00	18.77
Room 225	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.55	2,497	0.0	$306.21	$1,810.30	$340.00	4.80
Room 222B	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,432	0.11	392	0.0	$48.12	$416.06	$75.00	7.09
Room 224	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.55	2,497	0.0	$306.21	$1,810.30	$340.00	4.80
Room 227	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.57	2,622	0.0	$321.53	$1,846.82	$350.00	4.66
Room 227A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,046	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,046	0.02	78	0.0	$9.52	$36.52	$10.00	2.79
Room 227B	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,046	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,432	0.09	319	0.0	$39.06	$388.36	$55.00	8.53
Room 227C	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,046	Relamp & Reballast	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,432	0.09	319	0.0	$39.06	$388.36	$55.00	8.53
Room 226	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	651	0.10	157	0.0	$19.25	$416.06	$75.00	17.72
Room 226	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.11	178	0.0	$21.87	$416.06	$75.00	15.59
800 Wing Hallway	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	22	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	0.90	4,121	0.0	$505.25	$2,005.00	$330.00	3.32
800 Wing Hallway	21	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	21	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	High/Low Control	36	1,823	0.37	1,685	0.0	$206.64	$1,941.56	$0.00	9.40
800 Wing Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 801	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.12	562	0.0	$68.90	$434.32	$80.00	5.14
Room 802	50	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	50	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	2.05	9,366	0.0	$1,148.31	$4,898.63	$1,030.00	3.37
Room 803	26	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	26	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.07	4,870	0.0	$597.12	$2,774.09	$565.00	3.70
Room 803A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.02	99	0.0	$12.12	$36.52	$10.00	2.19
Room 805	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.57	2,622	0.0	$321.53	$1,576.82	$315.00	3.92
Room 805B	12	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	2,046	Relamp	Yes	12	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	16	1,432	0.09	333	0.0	$40.85	$746.70	$130.00	15.10
Room 807	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.04	174	0.0	$21.30	$144.92	$0.00	6.81
Room 807	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.33	1,498	0.0	$183.73	$978.18	$190.00	4.29
Faculty Restroom	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.04	174	0.0	$21.30	$144.92	$0.00	6.81

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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
Boys Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.02	87	0.0	$10.65	$72.46	$0.00	6.81
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.12	562	0.0	$68.90	$434.32	$45.00	5.65
Girls Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.02	87	0.0	$10.65	$72.46	$0.00	6.81
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.12	562	0.0	$68.90	$434.32	$45.00	5.65
Room 803	24	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	24	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.98	4,495	0.0	$551.19	$2,394.54	$500.00	3.44
Room 808	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	930	0.03	53	0.0	$6.49	$54.77	$15.00	6.13
Room 811	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.66	2,997	0.0	$367.46	$1,686.36	$345.00	3.65
Room 810	21	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	21	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.86	3,934	0.0	$482.29	$2,230.22	$455.00	3.68
Room 812	26	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	26	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.07	4,870	0.0	$597.12	$2,774.09	$565.00	3.70
Room 814	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	0.08	294	0.0	$36.09	$379.55	$65.00	8.72
Room 813	35	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	35	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.44	6,556	0.0	$803.81	$3,537.04	$735.00	3.49
Room 815A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.08	375	0.0	$45.93	$379.55	$65.00	6.85
Room 815B	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.25	1,124	0.0	$137.80	$598.64	$125.00	3.44
Room 815C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.08	375	0.0	$45.93	$379.55	$65.00	6.85
Room 817	35	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	35	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.44	6,556	0.0	$803.81	$3,537.04	$735.00	3.49
Room 818	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.08	375	0.0	$45.93	$379.55	$65.00	6.85
Room 818	31	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	2,604	Relamp	Yes	31	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	36	1,823	0.54	2,488	0.0	$305.04	$3,305.16	$210.00	10.15
Room 818	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,823	0.15	699	0.0	$85.70	$704.76	$35.00	7.82
Room 818	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 818M	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	930	0.04	62	0.0	$7.61	$144.92	$0.00	19.05
Room 818W	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	651	0.10	166	0.0	$20.40	$559.84	$35.00	25.72
Room 818A	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	930	0.02	31	0.0	$3.80	$72.46	$0.00	19.05
Room 818C	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	930	0.02	31	0.0	$3.80	$72.46	$0.00	19.05
Room 818B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.08	134	0.0	$16.40	$379.55	$65.00	19.17
Room 820	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.08	134	0.0	$16.40	$379.55	$65.00	19.17

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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
800B Stairwell	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,823	0.16	749	0.0	$91.86	$419.09	$60.00	3.91
800B Stairwell	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Girls Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,823	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.04	138	0.0	$16.96	$73.03	$20.00	3.13
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
Room 304	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 301	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.57	937	0.0	$114.83	$1,846.82	$350.00	13.03
Room 301A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.02	35	0.0	$4.33	$36.52	$10.00	6.13
Room 301B	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.02	35	0.0	$4.33	$36.52	$10.00	6.13
Room 301C	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.02	35	0.0	$4.33	$36.52	$10.00	6.13
Room 306	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 303	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 308	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 305	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 310	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 312	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 307	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 309	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.46	2,123	0.0	$260.28	$1,430.76	$275.00	4.44
Room 314	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 311	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 316	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.49	2,248	0.0	$275.59	$1,467.27	$285.00	4.29
Room 313	34	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	2,604	Relamp	Yes	34	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,823	0.78	3,579	0.0	$438.80	$3,278.27	$720.00	5.83
Room 315	36	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	2,604	Relamp	Yes	36	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,823	0.83	3,789	0.0	$464.61	$3,375.81	$750.00	5.65
Room 320	24	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	2,604	Relamp	Yes	24	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,823	0.55	2,526	0.0	$309.74	$2,250.54	$500.00	5.65
Room 320	1	Exit Signs: Fluorescent	None	15	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	91	0.0	$11.12	$72.42	$0.00	6.51
Room 318	34	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	2,604	Relamp	Yes	34	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	1,823	0.78	3,579	0.0	$438.80	$3,278.27	$720.00	5.83

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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 322	1	Linear Fluorescent - T8: 2' T8 (17W) - 4L	Wall Switch	63	930	Relamp	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	930	0.02	31	0.0	$3.80	$65.03	$20.00	11.84
Room 527C	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.14	223	0.0	$27.34	$452.58	$85.00	13.44
Room 523	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.08	134	0.0	$16.40	$379.55	$30.00	21.31
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.08	375	0.0	$45.93	$379.55	$30.00	7.61
Room 507	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,823	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,276	0.41	1,311	0.0	$160.76	$1,357.73	$255.00	6.86
Room 505	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,823	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,276	0.41	1,311	0.0	$160.76	$1,357.73	$255.00	6.86
Room 506	15	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.72	3,297	0.0	$404.25	$1,905.45	$405.00	3.71
Room 506	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.04	174	0.0	$21.30	$144.92	$0.00	6.81
Room 504	27	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	27	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.11	5,057	0.0	$620.08	$2,828.86	$580.00	3.63
Room 504A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.04	198	0.0	$24.23	$73.03	$20.00	2.19
Room 503	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 501	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 502	27	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	27	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.11	5,057	0.0	$620.08	$2,828.86	$580.00	3.63
Room 502A	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.08	375	0.0	$45.93	$379.55	$65.00	6.85
500A Stairwell	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	651	0.14	236	0.0	$28.87	$419.09	$60.00	12.44
500A Stairwell	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.02	99	0.0	$12.12	$36.52	$10.00	2.19
Room 600	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.02	35	0.0	$4.33	$36.52	$10.00	6.13
Room 602	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 604	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 601	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 605	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 603	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 608	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 605	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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 603	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 608	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 606	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Room 607	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	651	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.41	468	0.0	$57.42	$1,357.73	$255.00	19.21
Faculty Restroom	1	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	2,604	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	15	2,604	0.06	255	0.0	$31.21	$17.23	$5.00	0.39
Faculty Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.10	440	0.0	$53.90	$416.06	$40.00	6.98
Room 609M	1	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	2,604	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	15	2,604	0.06	255	0.0	$31.21	$17.23	$5.00	0.39
Room 609M	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.10	440	0.0	$53.90	$416.06	$75.00	6.33
Room 609M	1	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	2,604	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	15	2,604	0.06	255	0.0	$31.21	$17.23	$5.00	0.39
Room 611	2	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	Yes	2	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	651	0.12	191	0.0	$23.47	$304.45	$45.00	11.05
Room 613 Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,823	0.24	1,099	0.0	$134.75	$565.15	$100.00	3.45
Room 613A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.11	499	0.0	$61.24	$416.06	$75.00	5.57
Room 614	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
Room 613	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.22	999	0.0	$122.49	$832.12	$150.00	5.57
Room 613B	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
Room 613H	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.10	440	0.0	$53.90	$416.06	$75.00	6.33
Room 613C	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,823	0.11	499	0.0	$61.24	$416.06	$75.00	5.57
Room 613D	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.53	2,418	0.0	$296.45	$1,343.33	$290.00	3.55
Room 613D	6	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	Yes	6	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	651	0.35	574	0.0	$70.42	$373.35	$65.00	4.38
Room 613D	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Team Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.29	1,319	0.0	$161.70	$708.18	$155.00	3.42
Team 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	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 613F	6	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	Yes	6	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	651	0.35	574	0.0	$70.42	$373.35	$65.00	4.38
600B Stairwell	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,823	0.11	499	0.0	$61.24	$346.06	$40.00	5.00
Room 401	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	1,823	Relamp	Yes	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,276	0.98	3,147	0.0	$385.83	$2,934.54	$570.00	6.13

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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 405	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.02	87	0.0	$10.65	$72.46	$0.00	6.81
Room 405	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.57	2,622	0.0	$321.53	$1,576.82	$315.00	3.92
Room 405	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 405	1	Compact Fluorescent: (2) 26W CFL - 4-Pin	Wall Switch	52	930	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	36	930	0.01	17	0.0	$2.10	$54.36	$0.00	25.91
Room 403	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.16	268	0.0	$32.81	$489.09	$95.00	12.01
Room 404A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.16	268	0.0	$32.81	$489.09	$95.00	12.01
Room 407	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.62	2,810	0.0	$344.49	$1,631.59	$330.00	3.78
Room 407	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.02	87	0.0	$10.65	$72.46	$0.00	6.81
Girls Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,604	0.04	168	0.0	$20.56	$73.03	$20.00	2.58
Boys Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,604	0.04	168	0.0	$20.56	$73.03	$20.00	2.58
Green 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	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 424	13	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	13	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.53	2,435	0.0	$298.56	$1,252.04	$265.00	3.31
Room 420	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 420	3	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	930	Relamp	No	3	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	16	930	0.01	22	0.0	$2.75	$51.68	$15.00	13.32
Room 420	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	651	0.53	864	0.0	$105.87	$1,343.33	$290.00	9.95
Room 420	15	LED - Fixtures: (1) 50W LED Fixture	Wall Switch	50	250	None	Yes	15	LED - Fixtures: (1) 50W LED Fixture	Occupancy Sensor	50	175	0.15	65	0.0	$7.93	$270.00	$35.00	29.63
Room 420	27	Halogen Incandescent: (1) 1000W Halogen Inc Lamp	Wall Switch	1,000	250	Relamp	Yes	27	LED Screw-In Lamps: (1) 150W LED Lamp Screw-In	Occupancy Sensor	150	175	15.84	6,947	0.0	$851.82	$1,815.08	$310.00	1.77
Room 420	6	Halogen Incandescent: (1) 750W Halogen Inc Lamp	Wall Switch	750	250	Relamp	Yes	6	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	113	175	2.64	1,158	0.0	$141.97	$373.35	$65.00	2.17
Room 420	35	Halogen Incandescent: (1) 575W Halogen Inc Lamp	Wall Switch	575	250	Relamp	Yes	35	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	86	175	11.81	5,178	0.0	$634.92	$2,222.88	$385.00	2.89
Room 420	2	Halogen Incandescent: (1) 500W Halogen Inc Lamp	Wall Switch	500	250	Relamp	Yes	2	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	75	175	0.59	257	0.0	$31.55	$304.45	$45.00	8.22
Room 420	4	Halogen Incandescent: (1) 250W Halogen Inc Lamp	Wall Switch	250	250	Relamp	Yes	4	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	38	175	0.59	257	0.0	$31.55	$338.90	$55.00	9.00
Auditorium	25	Halogen Incandescent: (1) 500W Halogen Inc Lamp	Wall Switch	500	250	Relamp	No	25	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	75	250	6.96	3,055	0.0	$374.53	$430.63	$125.00	0.82
Auditorium	22	Compact Fluorescent: (1) 42W CFL - 4-Pin	Wall Switch	42	250	Relamp	No	22	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	30	250	0.17	76	0.0	$9.31	$597.96	$0.00	64.26
Auditorium	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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 440G	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.12	201	0.0	$24.61	$434.32	$80.00	14.40
Room 440F	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.11	178	0.0	$21.87	$416.06	$75.00	15.59
Room 440F	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.08	134	0.0	$16.40	$379.55	$65.00	19.17
Room 440E	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	930	0.03	53	0.0	$6.49	$54.77	$15.00	6.13
Room 440D	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.08	134	0.0	$16.40	$379.55	$65.00	19.17
Room 440C	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 440A	2	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	Yes	2	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	651	0.12	191	0.0	$23.47	$304.45	$45.00	11.05
Main Office Hallway	13	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	23	930	Relamp	Yes	13	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	High/Low Control	3	651	0.18	286	0.0	$35.09	$623.93	$65.00	15.93
Closets	3	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	2,604	Relamp	Yes	3	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	1,823	0.18	804	0.0	$98.58	$321.68	$15.00	3.11
Restroom	1	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	15	930	0.06	91	0.0	$11.15	$17.23	$5.00	1.10
Principal Office	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	None	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Closets	1	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	15	930	0.06	91	0.0	$11.15	$17.23	$5.00	1.10
Restroom	1	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	15	930	0.06	91	0.0	$11.15	$17.23	$5.00	1.10
Vice Principal Office	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	None	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	456	0.05	52	0.0	$6.39	$270.00	$35.00	36.78
Room 901	11	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	11	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.45	2,060	0.0	$252.63	$1,142.50	$235.00	3.59
Room 901C	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.08	375	0.0	$45.93	$379.55	$65.00	6.85
Restroom	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,604	0.02	87	0.0	$10.65	$72.46	$0.00	6.81
Room 901A	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,604	0.03	148	0.0	$18.17	$54.77	$15.00	2.19
Room 900	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.49	2,248	0.0	$275.59	$1,197.27	$250.00	3.44
Room 903	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.62	2,810	0.0	$344.49	$1,631.59	$330.00	3.78
Room 905	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.62	2,810	0.0	$344.49	$1,631.59	$330.00	3.78
Room 913	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.02	35	0.0	$4.33	$36.52	$10.00	6.13
Room 915	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	930	0.04	60	0.0	$7.34	$73.03	$20.00	7.22
Room 915	1	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	930	Relamp	No	1	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	16	930	0.00	7	0.0	$0.92	$17.23	$0.00	18.77
Room 914	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.08	134	0.0	$16.40	$379.55	$65.00	19.17

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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 914	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	930	0.02	31	0.0	$3.80	$72.46	$0.00	19.05
Room 902	26	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	26	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	1.07	4,870	0.0	$597.12	$2,774.09	$565.00	3.70
Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.04	198	0.0	$24.23	$73.03	$20.00	2.19
Room 910	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.16	268	0.0	$32.81	$489.09	$95.00	12.01
Room 908	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 908	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.12	562	0.0	$68.90	$434.32	$80.00	5.14
Room 908A	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	2,604	0.03	148	0.0	$18.17	$54.77	$15.00	2.19
Room 908A	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	930	0.02	31	0.0	$3.80	$72.46	$0.00	19.05
Room 904A	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	930	0.04	71	0.0	$8.65	$73.03	$20.00	6.13
Room 934A	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.29	1,311	0.0	$160.76	$653.41	$140.00	3.19
Room 934A	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 938	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.08	134	0.0	$16.40	$379.55	$65.00	19.17
Room 937	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.16	268	0.0	$32.81	$489.09	$95.00	12.01
Room 935	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.21	334	0.0	$41.01	$543.86	$110.00	10.58
Room 935	2	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	930	Relamp	No	2	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Wall Switch	16	930	0.01	15	0.0	$1.84	$34.45	$10.00	13.32
Shower	4	Incandescent: (1) 100W Incandescent - Screw-In	Wall Switch	100	930	Relamp	Yes	4	LED Screw-In Lamps: (1) 15W LED Lamp Screw-In	Occupancy Sensor	15	651	0.23	383	0.0	$46.94	$338.90	$55.00	6.05
Room 932	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.14	223	0.0	$27.34	$452.58	$85.00	13.44
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	651	0.12	201	0.0	$24.61	$434.32	$45.00	15.82
Room 930	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.11	178	0.0	$21.87	$416.06	$75.00	15.59
Room 922	6	Compact Fluorescent: (1) 23W CFL - Screw-In	Wall Switch	23	2,604	Relamp	No	6	LED Screw-In Lamps: (1) 16W LED Lamp Screw-In	Wall Switch	16	2,604	0.03	126	0.0	$15.42	$103.35	$30.00	4.76
Room 922	3	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,604	Relamp & Reballast	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.27	1,216	0.0	$149.14	$625.09	$95.00	3.55
Room 909 (Fitness Center)	60	Compact Fluorescent: Sportlite (252W)	Wall Switch	252	2,604	Fixture Replacement	Yes	60	LED - Fixtures: Low-Bay	High/Low Control	176	1,823	5.05	23,092	0.0	$2,831.27	$40,768.26	$9,420.00	11.07
Room 909	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.12	562	0.0	$68.90	$434.32	$45.00	5.65
Boys Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.04	198	0.0	$24.23	$73.03	$20.00	2.19

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Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.12	562	0.0	$68.90	$434.32	$45.00	5.65
Girls Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.04	198	0.0	$24.23	$73.03	$20.00	2.19
Room 961C	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	930	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	930	0.03	53	0.0	$6.49	$54.77	$15.00	6.13
Room 960	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	0.12	442	0.0	$54.13	$434.32	$80.00	6.55
Room 962	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,046	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,432	0.16	589	0.0	$72.18	$489.09	$95.00	5.46
Room 907	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,604	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,823	0.16	749	0.0	$91.86	$489.09	$95.00	4.29
Elevator Car	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.02	99	0.0	$12.12	$36.52	$10.00	2.19
Old BOE Office	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Old BOE Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	930	0.04	60	0.0	$7.34	$73.03	$20.00	7.22
Old BOE Office	31	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	31	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	651	0.79	1,290	0.0	$158.13	$3,596.26	$175.00	21.64
Room 552	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	930	0.04	60	0.0	$7.34	$73.03	$20.00	7.22
Room 554	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	651	0.19	314	0.0	$38.50	$562.12	$115.00	11.61
Room 556	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	651	0.19	314	0.0	$38.50	$562.12	$115.00	11.61
Room 556	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.08	134	0.0	$16.40	$379.55	$65.00	19.17
Room 556	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	651	0.08	134	0.0	$16.40	$379.55	$65.00	19.17
Room 555	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	930	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	651	0.15	250	0.0	$30.61	$704.76	$35.00	21.88
Room 557	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	930	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	651	0.10	157	0.0	$19.25	$416.06	$75.00	17.72
Maintenance Room	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,604	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.53	2,418	0.0	$296.45	$1,343.33	$290.00	3.55
Maintenance Room	2	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,604	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 8' Lamps	Occupancy Sensor	72	1,823	0.14	644	0.0	$79.01	$1,337.39	$140.00	15.15
Maintenance Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.02	99	0.0	$12.12	$36.52	$10.00	2.19
Ground Shop	5	Linear Fluorescent - T5: 4' T5 (28W) - 4L	Wall Switch	120	2,604	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,823	0.26	1,189	0.0	$145.76	$635.15	$135.00	3.43
Ground Shop	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Shop	1	Linear Fluorescent - T12: 8' T12 (75W) - 2L	Wall Switch	158	2,604	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 8' Lamps	Wall Switch	72	2,604	0.06	258	0.0	$31.58	$128.69	$0.00	4.08
Ground Shop	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,604	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,604	0.02	99	0.0	$12.12	$36.52	$10.00	2.19

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	500 Wing Mens Restroom	3	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom	2	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom	3	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	100 Wing Server Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Boys & Girls Restrooms (100 Wing)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Faculty Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Main Server Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Front Lobby (EF 14)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Principal Office Restroom (EF 103)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Cafeteria Restroom (EF 012)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Upper Gym Girls Locker Room (EF 902)	1	Exhaust Fan	0.5	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Gym	3	Exhaust Fan	2.0	84.0%	No	1,373	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Gym (EF 3D, 4D & 5D)	3	Exhaust Fan	0.8	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Boys Locker Room (EF 906)	1	Exhaust Fan	0.8	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Upper Gym Locker Room (EF 907)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	900 Wing Boys Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	901 Wing Girls Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Nurse's Office Restroom (EF 901)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Dishwashing Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Draft Motors	4	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		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?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Kitchen Hood	1	Kitchen Hood Exhaust Fan	1.5	84.0%	No	1,575	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Compressor Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Kitchen Storage Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	200 Wing Faculty Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	200 Wing Boys & Girls Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	200 Wing Server Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Suspension Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room	1	Exhaust Fan	0.8	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Child Development Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	400 Wing Boys & Girls Restroom (EF 404)	1	Exhaust Fan	0.5	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	75 Ton Aaon Unit	2	Supply Fan	20.0	91.0%	Yes	1,356	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	75 Ton Aaon Unit	3	Other	3.0	86.5%	Yes	1,373	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	75 Ton Aaon Unit	1	Return Fan	20.0	91.0%	Yes	1,356	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	75 Ton Aaon Unit	6	Combustion Air Fan	0.3	78.0%	Yes	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Old Wood Shop (EF 2A)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Green Room Boys Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Green Room Girls Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Social Study Book Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	500-600 Wing Elevator Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	500-600 Wing Hallway	1	Exhaust Fan	1.5	84.0%	No	1,373	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		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?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	500-600 Wing Restrooms	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Lower Gym	4	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Lower Gym Locker Rooms	4	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Old Boiler Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Coache's Office Restroom	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Electrical Room (EF 2-2A)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Elevator Room (EF 1-1A)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700 Wing Restroom (TX 1-1A)	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room 705, 707 & 709	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Dark Room	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room 719, 721 & 723	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room 717	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Kilns Room	2	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room 716	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room 714	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Rooms 706, 708 & 712	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700-800 Aaon Package 110-Ton	2	Supply Fan	15.0	91.0%	Yes	1,356	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700-800 Aaon Package 110-Ton	4	Other	3.0	86.5%	Yes	1,373	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700-800 Aaon Package 110-Ton	1	Return Fan	7.5	91.0%	Yes	1,356	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700-800 Aaon Package 110-Ton	4	Combustion Air Fan	0.3	78.0%	Yes	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		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?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	700-800 Back Aaon Package 100-Ton	2	Supply Fan	15.0	91.0%	Yes	1,356	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700-800 Back Aaon Package 100-Ton	4	Other	3.0	86.5%	Yes	1,373	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700-800 Back Aaon Package 100-Ton	1	Return Fan	7.5	91.0%	Yes	1,356	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700-800 Back Aaon Package 100-Ton	4	Combustion Air Fan	0.3	78.0%	Yes	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Heating Hot Water Loop (700-800 Wing)	1	Heating Hot Water Pump	10.0	91.7%	Yes	1,696	No	91.7%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Heating Hot Water Loop (700-800 Wing)	1	Heating Hot Water Pump	10.0	91.7%	Yes	1,696	No	91.7%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Heating Hot Water Loop (Rest of Building)	2	Heating Hot Water Pump	60.0	95.0%	Yes	2,665	No	95.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Heating Hot Water Loop (Rest of Building)	10	Heating Hot Water Pump	0.8	81.8%	No	1,373	No	81.8%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Sump Pumps	2	Process Pump	0.3	78.0%	No	686	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	DHW Loop	2	Water Supply Pump	0.3	78.0%	No	1,647	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
700 Wing Mech Room	Sump Pumps	2	Process Pump	1.5	85.5%	No	686	No	85.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 613E	Lower Gym	1	Supply Fan	2.0	84.0%	No	1,098	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 614	Lower Gym	1	Supply Fan	2.0	84.0%	No	1,098	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 614	Lower Gym	1	Supply Fan	0.8	81.8%	No	1,098	No	81.8%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 703A	Elevator	1	Process Pump	20.0	72.0%	No	1,300	No	72.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 802	Room 802	1	Exhaust Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 803	Elevator	1	Process Pump	20.0	72.0%	No	1,300	No	72.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Throughout School	Room Unit Ventillators	59	Supply Fan	0.2	68.5%	No	1,784	No	68.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	100 Wing Aaon Package 30-Ton	2	Supply Fan	3.0	86.5%	No	1,098	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	100 Wing Aaon Package 30-Ton	2	Other	2.0	84.0%	No	1,373	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		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?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	100 Wing Aaon Package 30-Ton	2	Return Fan	3.0	86.5%	No	1,098	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	100 Wing Aaon Package 30-Ton	2	Combustion Air Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Weight Room Carrier Package Unit 15-Ton	1	Supply Fan	5.0	89.5%	No	1,098	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Weight Room Carrier Package Unit 15-Ton	3	Other	0.5	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Weight Room Carrier Package Unit 15-Ton	1	Combustion Air Fan	0.1	68.5%	No	1,373	No	68.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Nurse's 1st Floor Office Carrier Package Unit 15-Ton	1	Supply Fan	5.0	89.5%	No	1,098	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Nurse's 1st Floor Office Carrier Package Unit 15-Ton	3	Other	0.5	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Nurse's 1st Floor Office Carrier Package Unit 15-Ton	1	Combustion Air Fan	0.1	68.5%	No	1,373	No	68.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Cafeteria Trane Package Unit 27.5-Ton	1	Supply Fan	10.0	91.7%	No	1,356	No	91.7%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Cafeteria Trane Package Unit 27.5-Ton	3	Other	1.0	85.5%	No	1,373	No	85.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Cafeteria Trane Package Unit 27.5-Ton	2	Combustion Air Fan	0.1	68.5%	No	1,373	No	68.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Cafeteria Trane Package Unit 27.5-Ton	2	Return Fan	1.0	85.5%	No	1,098	No	85.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Music Room (RTU3A) Aaon Package Unit 25-Ton	1	Supply Fan	15.0	91.0%	No	1,356	No	91.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Music Room (RTU3A) Aaon Package Unit 25-Ton	3	Other	0.8	81.8%	No	1,373	No	81.8%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Music Room (RTU3A) Aaon Package Unit 25-Ton	1	Combustion Air Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Music Room (RTU3A) Aaon Package Unit 25-Ton	1	Return Fan	2.0	84.0%	No	1,098	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Editing Room (RTU 3A) Aaon Package Unit 30-Ton	2	Supply Fan	3.0	86.5%	No	1,098	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Editing Room (RTU 3A) Aaon Package Unit 30-Ton	2	Other	2.0	84.0%	No	1,373	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Editing Room (RTU 3A) Aaon Package Unit 30-Ton	2	Return Fan	3.0	86.5%	No	1,098	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Editing Room (RTU 3A) Aaon Package Unit 30-Ton	2	Combustion Air Fan	0.3	78.0%	No	1,373	No	78.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	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)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	100 Wing Classrooms	1	Packaged AC	30.00		Yes	1	Packaged AC	30.00		9.50		No	0.00	0	0.0	$0.00	$66,479.15	$0.00	0.00
Roof	Sce- Math Office	1	Split-System AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Faculty Dining Room	1	Split-System AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Faculty Copy Room	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Faculty (RTU-3)	1	Packaged AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof (Old Unit)	Security Office	1	Split-System AC	0.75		Yes	1	Split-System AC	0.75		14.00		No	0.20	344	0.0	$42.23	$1,122.17	$69.00	24.94
Roof	Media Center	1	Packaged AC	25.00		Yes	1	Packaged AC	25.00		10.50		Yes	3.80	11,302	0.0	$1,385.66	$43,284.98	$2,225.00	29.63
Roof	Guidance Department	1	Packaged AC	8.50		Yes	1	Packaged AC	8.50		11.50		Yes	1.80	4,564	0.0	$559.63	$15,897.90	$870.50	26.85
Roof	Main Server Room	1	Split-System Air-Source HP	6.00	6.75	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Main Server Room	1	Split-System AC	0.75		Yes	1	Split-System AC	0.75		14.00		No	0.20	344	0.0	$42.23	$1,122.17	$69.00	24.94
Roof (Old Unit)	Child Study Team Room	1	Packaged AC	12.00		Yes	1	Packaged AC	12.00		11.50		Yes	2.55	6,444	0.0	$790.06	$17,626.20	$1,198.00	20.79
Roof	Main Office	1	Packaged AC	7.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Dance Studio	1	Packaged AC	6.00		Yes	1	Packaged AC	6.00		11.50		Yes	1.27	3,222	0.0	$395.03	$11,442.63	$688.00	27.22
Roof	Coach's Office	3	Split-System AC	0.75		Yes	3	Split-System AC	0.75		14.00		No	0.61	1,033	0.0	$126.68	$3,366.50	$207.00	24.94
Roof	Weight Room	1	Packaged AC	15.00		Yes	1	Packaged AC	15.00		11.50		Yes	3.18	8,055	0.0	$987.58	$21,807.75	$1,435.00	20.63
Roof	Nurse 1st Floor Office	1	Packaged AC	15.00		Yes	1	Packaged AC	15.00		11.50		Yes	3.18	8,055	0.0	$987.58	$21,807.75	$1,435.00	20.63
Roof	Cafeteria	1	Packaged AC	27.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof (Old Unit)	Room 209 to 211	1	Packaged AC	5.00		Yes	1	Packaged AC	5.00		14.00		Yes	1.73	3,930	0.0	$481.89	$11,844.80	$710.00	23.11
Roof	IT Rooms	1	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	IT Rooms	1	Split-System AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		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)	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)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof (Old Unit)	200 Wing	1	Packaged AC	12.00		Yes	1	Packaged AC	12.00		11.50		Yes	2.55	6,444	0.0	$790.06	$17,626.20	$1,198.00	20.79
Roof	World Language Office	1	Split-System AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room 301	2	Split-System AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room	1	Split-System AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Server Room	1	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Auditorium	1	Packaged AC	75.00		Yes	1	Packaged AC	75.00		9.50		Yes	5.90	26,195	0.0	$3,211.70	$170,197.88	$250.00	52.92
Roof (Old Unit)	Head End Room	1	Split-System AC	3.00		Yes	1	Split-System AC	3.00		14.00		No	0.82	1,378	0.0	$168.91	$4,488.66	$276.00	24.94
Roof	Music Room (RTU 2A)	1	Packaged AC	25.00		Yes	1	Packaged AC	25.00		10.50		Yes	3.80	11,302	0.0	$1,385.66	$43,284.98	$2,225.00	29.63
Roof	Editing Room (RTU 3A)	1	Packaged AC	30.00		Yes	1	Packaged AC	30.00		9.50		Yes	2.36	10,478	0.0	$1,284.68	$67,579.15	$250.00	52.41
Roof	English Dept Office	1	Split-System AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Social Study Dept Office	1	Split-System AC	0.75		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	700-800 Rooms	1	Packaged AC	110.00		Yes	1	Packaged AC	110.00		9.50		No	0.00	0	0.0	$0.00	$243,756.88	$0.00	0.00
Roof	700-809 Back	1	Packaged AC	100.00		Yes	1	Packaged AC	100.00		9.50		No	0.00	0	0.0	$0.00	$221,597.17	$0.00	0.00
Room 613 (Old Unit)	Room 613	1	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 613D (Old Unit)	Room 613D	1	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	Room 502	1	Split-System Air-Source HP	3.50	3.50	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Floor	Room 504	1	Split-System Air-Source HP	3.50	3.50	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

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)	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
Roof	Girls Locker Room	1	Furnace	320.00	Yes	1	Furnace	320.00	95.00%	AFUE	0.00	0	31.3	$276.24	$7,250.35	$400.00	24.80
Roof	Gym	2	Furnace	640.00	Yes	2	Furnace	640.00	95.00%	AFUE	0.00	0	125.3	$1,104.95	$29,001.39	$800.00	25.52
Roof	Boys Locker Room	1	Furnace	320.00	Yes	1	Furnace	320.00	95.00%	AFUE	0.00	0	31.3	$276.24	$7,250.35	$400.00	24.80
Boiler Room	Heating Hot Water Loop	7	Non-Condensing Hot Water Boiler	1,448.00	Yes	7	Condensing Hot Water Boiler	1,448.00	91.00%	Et	0.00	0	759.6	$6,698.60	$243,298.69	$22,299.20	32.99
Boiler Room	Heating Hot Water Loop	1	Non-Condensing Hot Water Boiler	1,448.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Heating Hot Water Loop	2	Non-Condensing Hot Water Boiler	1,448.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Maintenance Room	Maintenance Room	1	Warm Air Unit Heater	60.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Shop	Ground Shop	1	Warm Air Unit Heater	60.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Garage	Garage	1	Warm Air Unit Heater	60.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 109A	Room 109A	2	Furnace	202.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	100 Wing Classrooms RTU	1	Furnace	632.00	Yes	1	Furnace	632.00	95.00%	AFUE	0.00	0	56.9	$501.83	$14,319.43	$400.00	27.74
Roof	Media Center RTU	1	Furnace	283.50	Yes	1	Furnace	283.50	95.00%	AFUE	0.00	0	25.6	$225.59	$6,423.35	$400.00	26.70
Roof	Main Office RTU	1	Furnace	96.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Auditorium RTU	1	Furnace	903.00	Yes	1	Furnace	903.00	95.00%	AFUE	0.00	0	74.6	$658.14	$20,459.57	$400.00	30.48
Roof	Music Room (RTU 2A)	1	Furnace	316.00	Yes	1	Furnace	316.00	95.00%	AFUE	0.00	0	28.5	$250.92	$7,159.72	$400.00	26.94
Roof	Editing Room (RTU 3A)	1	Furnace	437.00	Yes	1	Furnace	437.00	95.00%	AFUE	0.00	0	39.7	$349.90	$9,901.25	$400.00	27.15
Roof	700-800 Rooms (RTU)	1	Furnace	705.00	Yes	1	Furnace	705.00	95.00%	AFUE	0.00	0	58.5	$515.64	$15,973.42	$400.00	30.20
Roof	700-809 Back (RTU)	1	Furnace	705.00	Yes	1	Furnace	705.00	95.00%	AFUE	0.00	0	58.5	$515.64	$15,973.42	$400.00	30.20

Demand Control Ventilation Recommendations

		Recommendation Inputs				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	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
Roof	Cafeteria	2	27.50		330.00	0.00	1,515	12.4	$294.91	$2,718.84	$0.00	9.22
Roof	Auditorium	2	75.00		900.00	0.00	4,263	33.8	$820.31	$2,718.84	$0.00	3.31
Roof	Music Room (RTU 2A)	2	25.00		316.00	0.00	1,421	11.7	$277.40	$2,718.84	$0.00	9.80
Roof	Editing Room (RTU 3A)	2	30.00		437.00	0.00	1,705	16.2	$351.93	$2,718.84	$0.00	7.73

Pipe Insulation Recommendations

		Recommendation Inputs		Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	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 & HHW System	35	1.50	0.00	0	8.0	$70.29	$152.25	$0.00	2.17
Boiler Room	Domestic & HHW System	15	2.50	0.00	0	4.4	$39.16	$65.25	$0.00	1.67

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	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	Throughout Building	2	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Coach's Restroom	Lower Gym Locker Room; 400-500-600 Restrooms	2	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	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	54	Faucet Aerator (Lavatory)	2.20	1.00	0.00	0	85.0	$749.68	$387.18	$0.00	0.52
Restrooms	4	Faucet Aerator (Lavatory)	2.40	1.00	0.00	0	7.3	$64.79	$28.68	$0.00	0.44

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions		Proposed Conditions			Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	Yes	No	0.00	586	0.0	$71.89	$518.60	$50.00	6.52
Kitchen	1	Cooler (35F to 55F)	No	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Medium Temp Freezer (0F to 30F)	No	Yes	No	0.00	586	0.0	$71.89	$518.60	$50.00	6.52

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	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
020 Cafeteria	1	Stand-Up Refrigerator, Glass Door (>50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
020 Cafeteria	2	Stand-Up Refrigerator, Glass Door (>50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
020 Cafeteria	2	Stand-Up Refrigerator, Solid Door (>50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
020 Cafeteria	4	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
020 Cafeteria	2	Stand-Up Refrigerator, Glass Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Self-Contained Unit (≥175 lbs/day), Batch	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 613A	1	Self-Contained Unit (≥175 lbs/day), Batch	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 901	1	Self-Contained Unit (≥175 lbs/day), Batch	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	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	3	Electric Steamer	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Electric Convection Oven (Half Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Gas Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Gas Fryer	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Gas Convection Oven (Half Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Dishwasher Inventory & Recommendations

	Existing Conditions					Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Dishwasher Type	Water Heater Fuel Type	Booster Heater Fuel Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Payback w/ Incentives in Years
Room 020E	1	Single Tank Conveyor (High Temp)	Electric	N/A	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Throughout	52	Printers	60.0	Yes
Throughout	16	Small Fridge	153.0	Yes
Throughout	17	Copy Machine	200.0	Yes
Throughout	5	Flat Screen TV	71.0	Yes
Throughout	27	Microwave	1,000.0	Yes
Throughout	11	Coffee Machine	900.0	Yes
Throughout	20	Refrigerator	172.0	Yes
Throughout	12	Toaster	850.0	Yes
Throughout	2	Washing Machine	900.0	Yes
Throughout	2	Dryer Machine	5,000.0	Yes
Throughout	13	Water Cooler	92.0	Yes
Throughout	14	Wall TV	71.0	Yes
Kitchen	1	Commercial Coffee Maker	4,500.0	Yes
Throughout	50	Computer	120.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	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
Room 032	1	Refrigerated	Yes	0.00	1,612	0.0	$197.63	$230.00	$0.00	1.16
Room 020	1	Refrigerated	Yes	0.00	1,612	0.0	$197.63	$230.00	$0.00	1.16
Room 020	1	Non-Refrigerated	Yes	0.00	343	0.0	$42.00	$230.00	$0.00	5.48

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

22

ENERGY STAR® Score[1]

Ramapo High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 241,600
Built: 1956

For Year Ending: September 30, 2017
Date Generated: September 24, 2018

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Ramapo High School 331 George Stret Franklin Lakes, New Jersey 07417	Ramapo Indian Hills Regional High School District 131 Yawpo Avenue Oakland, NJ 07436 (____)____-_____	Frank Ceurvels 131 Yawpo Avenue Oakland, NJ 07436 201-416-8100 fceurvels@rih.org

Property ID: 6452422

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
108.7 kBtu/ft²

Source EUI
165.3 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	19,182,567 (73%)
Electric - Grid (kBtu)	7,068,543 (27%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	82.6
National Median Source EUI (kBtu/ft²)	125.7
% Diff from National Median Source EUI	32%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	1,735

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)