Local Government Energy Audit:
Energy Audit Report

Princeton High School

151 Moore Street
Princeton, New Jersey 08540

Princeton Public Schools

January 24, 2019

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.

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1 EXECUTIVE SUMMARY

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

Princeton High School is a 293,020 square foot facility comprised of various space types within one building. The school building is three floors and includes classrooms, offices, cafeteria, gym, performing arts center, auditorium, library, corridors, nurses' office, training room and a sub-basement mechanical space.

Lighting at Princeton High School consists of aging and inefficient T8 fixtures and majority of HVAC equipment (AHUs and ACs) in need of replacement with new high efficiency equipment and controls. Heating is supplied by two 350 bhp (boiler horse power) steam boilers. A thorough description of the facility and our observations are in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 10 measures which together represent an opportunity for Princeton High School to reduce annual energy costs by roughly $141,554 and annual greenhouse gas emissions by 1,110,521 lbs. CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 3.2 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 Princeton High School's annual energy use by 14%.

Figure 1 – Previous 12 Month Utility Costs

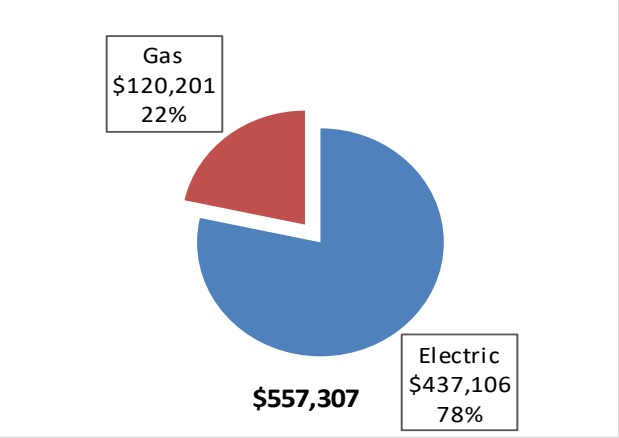
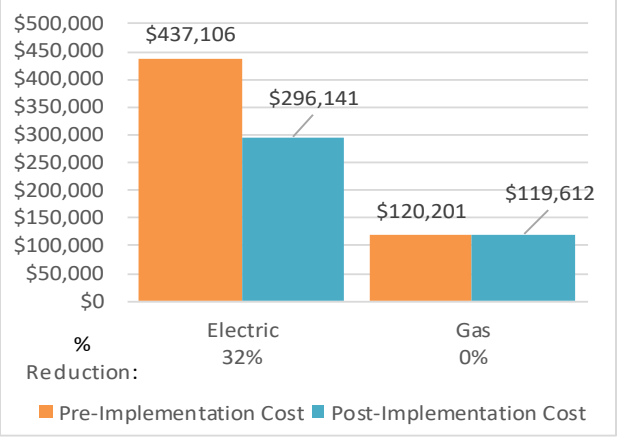


Figure 2 – Potential Post-Implementation Costs



A detailed description of Princeton 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			**762,293**	**99.5**	**0.0**	**$98,246.27**	**$297,079.38**	**$59,410.00**	**$237,669.38**	**2.4**	**767,623**
ECM 1	Install LED Fixtures	Yes	130,995	16.8	0.0	$16,882.96	$151,102.01	$29,250.00	$121,852.01	7.2	131,911
ECM 2	Retrofit Fixtures with LED Lamps	Yes	631,298	82.7	0.0	$81,363.31	$145,977.37	$30,160.00	$115,817.37	1.4	635,712
Lighting Control Measures			**156,106**	**19.8**	**0.0**	**$20,119.40**	**$90,388.00**	**$10,360.00**	**$80,028.00**	**4.0**	**157,198**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	120,825	15.3	0.0	$15,572.24	$86,188.00	$10,360.00	$75,828.00	4.9	121,670
ECM 4	Install High/Low Lighitng Controls	Yes	35,281	4.5	0.0	$4,547.16	$4,200.00	$0.00	$4,200.00	0.9	35,528
Motor Upgrades			**14,550**	**3.6**	**0.0**	**$1,875.23**	**$55,493.51**	**$0.00**	**$55,493.51**	**29.6**	**14,652**
	Premium Efficiency Motors	No	14,550	3.6	0.0	$1,875.23	$55,493.51	$0.00	$55,493.51	29.6	14,652
Variable Frequency Drive (VFD) Measures			**154,302**	**41.2**	**0.0**	**$19,886.82**	**$148,589.00**	**$23,680.00**	**$124,909.00**	**6.3**	**155,381**
ECM 5	Install VFDs on Constant Volume (CV) HVAC	Yes	136,387	39.0	0.0	$17,577.87	$130,543.10	$23,680.00	$106,863.10	6.1	137,340
ECM 6	Install VFDs on Boiler Feedwater Pumps	Yes	17,915	2.3	0.0	$2,308.95	$18,045.90	$0.00	$18,045.90	7.8	18,040
Electric Unitary HVAC Measures			**54,228**	**33.5**	**0.0**	**$6,989.09**	**$495,234.64**	**$15,278.00**	**$479,956.64**	**68.7**	**54,608**
	Install High Efficiency Electric AC	No	46,567	27.6	0.0	$6,001.62	$448,720.96	$13,392.00	$435,328.96	72.5	46,892
	Install High Efficiency Heat Pumps	No	7,662	5.9	0.0	$987.48	$46,513.68	$1,886.00	$44,627.68	45.2	7,715
HVAC System Improvements			**71,283**	**16.1**	**0.0**	**$9,187.14**	**$11,550.00**	**$2,750.00**	**$8,800.00**	**1.0**	**71,781**
	Install Dual Enthalpy Outside Economizer Control	No	71,283	16.1	0.0	$9,187.14	$11,550.00	$2,750.00	$8,800.00	1.0	71,781
Domestic Water Heating Upgrade			**0**	**0.0**	**77.9**	**$589.15**	**$372.84**	**$0.00**	**$372.84**	**0.6**	**9,125**
ECM 7	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	77.9	$589.15	$372.84	$0.00	$372.84	0.6	9,125
Food Service Equipment & Refrigeration Measures			**7,650**	**0.9**	**0.0**	**$985.91**	**$4,488.60**	**$0.00**	**$4,488.60**	**4.6**	**7,703**
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	1,311	0.2	0.0	$168.92	$606.60	$0.00	$606.60	3.6	1,320
ECM 9	Replace Refrigeration Equipment	Yes	6,339	0.7	0.0	$816.99	$3,882.00	$0.00	$3,882.00	4.8	6,383
Plug Load Equipment Control - Vending Machine			**13,398**	**0.0**	**0.0**	**$1,726.82**	**$2,990.00**	**$0.00**	**$2,990.00**	**1.7**	**13,492**
ECM 10	Vending Machine Control	Yes	13,398	0.0	0.0	$1,726.82	$2,990.00	$0.00	$2,990.00	1.7	13,492
TOTALS FOR HIGH PRIORITY MEASURES			**1,093,749**	**161.5**	**77.9**	**$141,554.38**	**$543,907.82**	**$93,450.00**	**$450,457.82**	**3.2**	**1,110,521**
TOTALS FOR ALL EVALUATED MEASURES			**1,233,811**	**214.7**	**77.9**	**$159,605.84**	**$1,106,185.97**	**$111,478.00**	**$994,707.97**	**6.2**	**1,251,562**

* - 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.

Motor Upgrades generally involve replacing older standard efficiency motors with high efficiency standard (NEMA Premium®). Motors replacements generally assume the same size motors, just higher efficiency. Although occasionally additional savings can be achieved by downsizing motors to better meet current load requirements. This measure saves energy by reducing the power used by the motors, due to improved electrical efficiency.

Variable Frequency Drives (VFDs) are motor control devices. These measures control the speed of a motor so that the motor spins at peak efficiency during partial load conditions. Sensors adapt the speed to flow, temperature, or pressure settings which is much more efficient that usage a valve or damper to control flow rates or running the motor at full speed when only partial power is needed. These measures save energy by controlling motor usage more efficiently.

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.

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 16 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 Princeton High School include:

- Close Doors and Windows
- Perform Proper Lighting Maintenance
- 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
- Assess Chillers & Request Tune-Ups
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Repair/Replace Steam Traps
- Perform Proper Boiler Maintenance
- Perform Proper Furnace Maintenance
- Perform Proper Water Heater Maintenance
- Install Plug Load Controls
- Water Conservation

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 Princeton High School. Based on the configuration of the site and its loads there is a high potential for installing a photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	High	
System Potential	488	kW DC STC
Electric Generation	581,389	kWh/yr
Displaced Cost	$50,580	/yr
Installed Cost	$1,268,800	

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
- Pay for Performance - Existing Building (P4P EB)
- 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.

Larger facilities with an interest in a more comprehensive whole building approach to energy conservation should consider participating in the Pay for Performance (P4P) program. Projects eligible for this project program must meet minimum savings requirements. Final incentives are calculated based on actual measured performance achieved at the end of the project. The application process is more involved, and it requires working with a qualified P4P contractor, but the process may result in greater energy savings overall and more lucrative incentives, up to 50% of project's total cost.

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 8.4 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			
Gary Weisman	Director of Plant Operations	GaryWeisman@princetonk12.org	(609) 203-4534
Peter Vazquez	Operations Manager	PeterVazquez@princetonk12.org	(609) 751-3916
Stephanie Kennedy	Business Administrator	stephaniekennedy@princetonk12.org	(609) 806-4204
TRC Energy Services			
Yagna Otia	Auditor	Yotia@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On July 31, 2018, TRC performed an energy audit at Princeton High School located in Princeton, New Jersey. TRC's auditor met with Jim Abbott to review the facility operations and help focus our investigation on specific energy-using systems.

Princeton High School is a 293,020 square foot facility comprised of various space types within one building. The School building is three floors and includes classrooms, offices, cafeteria, gym, performing arts center, auditorium, media library, corridors, nurses' office, training room and a sub-basement mechanical space.

The building was constructed in 1927. Over the last several years the facility has replaced all its existing T12 fluorescent fixtures with T8 fluorescent fixtures. The site is interested in a new energy conservation measures that can provide its overall energy consumption reduction.

2.3 Building Occupancy

The school building is open Monday through Friday. The typical schedule is presented in the table below. The school operates 10 months throughout the year and camps are run throughout the summer. During a typical day, the facility is occupied by approximately 150 staff and 500 students.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Princeton High School	Weekday	6AM-11PM
Princeton High School	Weekend	6AM-11PM

2.4 Building Envelope

The school building walls are constructed of concrete block and structural steel with a stone façade on performing arts center side and brick veneer on the other sides of the building. The building has flat roof sections covered with black membrane that is in good condition. The building has double pane windows which are in good condition and show little sign of excessive infiltration. The exterior doors are constructed of aluminum and in good condition except that the door seals have worn out which increases the level of outside air infiltration.

Image 1 Building Exterior and Roof

2.5 On-Site Generation

Princeton 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 is provided mostly by 32-Watt linear fluorescent T8 lamps with electronic ballasts as well as some compact fluorescent lamps (CFLs). Most of the fixtures are 2-lamp or 3-lamp, 4-foot long troffers with diffusers. The facility's maintenance technician indicated that the building had a comprehensive T8 retrofit several years ago.

Image 2 Lighting Fixtures in Gym and sample bulb

Hallways and small area of the auditorium are primarily lit with 26-Watt or 42-Watt CFL lamps in recessed can ceiling fixtures.

Gymnasium and gym offices have 39-Watt LED ambient indirect fixtures and controlled by occupancy sensors. The occupancy sensors are either wall or ceiling mounted depending on the space layout located in fitness center. Stairwells, elevator lobbies and main lobby areas do not contain any occupancy sensors and are on 24 hours per day throughout the year.

Ground floor hallway, room 277 and room 100 are primarily lit with 100-Watt metal halide fixtures and controlled by wall switches. All exit signs are LED.

Lighting control in most spaces is provided by wall switches. The auditorium, cafeteria and media room are controlled by high/low controls.

The building's exterior lighting consists primarily of inefficient 250-Watt metal halide and 400-Watt mercury vapor fixtures that are controlled by photocells, while a small amount of wall pack fixtures contains 32-Watt CFLs.

Image 3 Lighting fixtures used by School

Chilled Water and Condenser Water System

The facility is served by a single chilled water plant. The chiller plant consists of two 250-ton, Carrier, R-22, water-cooled centrifugal chillers (CH1 & CH2). The chillers are configured in a dual temperature distribution loop with two 75 hp variable flow chilled water pumps (DTWP1 & 2) with rated flow of 1,500 gallon per minute (gpm) and a single 25 hp chilled water pump controlled by VFD. Chilled water is distributed to the facility based on a reset schedule. The chiller plant is locked out when the outside air temperature is below 45°F. Both chillers run simultaneously for school operation.

Image 4 Chiller Plant

The condenser water system consists of two, one-cell cooling towers (CT1 & 2). Water is circulated to both towers, there is no valving that allows only a single tower to operate. Each tower has one 40 hp fan motor controlled by VFD. Fan motors are staged based on maintaining basin water temperature. Condenser water is supplied to the chillers by two 40 hp constant flow pumps (CWP1 & 2) with rated flow of 750 gpm. The condenser water temperature is reset with water supplied at 80°F when the outside air temperature is above 70°F and the setpoint is reset to 65°F when the outside air is below 55°F. The chillers are 12-years old and appear in good condition.

Image 5 Cooling Towers on Roof

Both cooling towers are well maintained and in good condition. They are located on roof.

Steam to Hot Water Heating System

The steam system consists of two 350 boiler horse power York Shipley Global natural draft boilers. The boilers have a nominal combustion efficiency of 75.5%. Each boiler has a 25 hp forced draft fan with discharge dampers to control the volume of combustion air. There are two 5 hp condensate return pumps and six 3 hp feed water pumps to maintain water level in the boilers. Heating hot water is supplied to air handlers through two heat exchangers each having a 75 hp based mounted hot water pumps that are controlled with VFDs. Hot water is supplied at 180°F when the outside air temperature is below 50°F and the setpoint is reset to 155°F when the outside air is above 65°F.

The boilers operate in a lead/lag configuration. Both boilers may be required during cold weather. The lead boiler is rotated weekly. The heating system is controlled with building energy management system (BEMS). The boilers are 14 years in good condition and well maintained.

Image 6 Boiler Plant

Chilled Water Air Conditioning System (CHW)

There are sixteen air handling units (AHU-A, AHU-B, AHU-C, AHU-E, AHU-F and AHU-G series) that serve the entire school. Each AHU draws air from its own return air shaft and supplies air to its own air shaft. The AHUs are all constant air volume (CAV) system and are equipped with chilled water coils for cooling and hot water coils for heating. They are controlled with BEMS control system.

AHU-A1 and A2 are located on the roof and serve the school offices and library. Each AHU has two 15 hp supply fans and one 5 hp return fan. The AHUs have outside air economizers to utilize free cooling when the outside air temperature is lower than the return air temperature.

Image 7 AHUs on Roof

AHU-B1 is located on roof and serves the cafeteria. The AHU has one 7.5 hp supply fans and one 2 hp return fan.

AHU-C1 and C2 are located in ground floor mechanical room and serves ground floor. These AHUs are constant air volume (CAV) system. Each AHU has a single 7.5 hp supply fan and no rerun fan.

AHU-F series are located on roof and serves auditorium, stage, music rooms, corridors, lobby, drama room, admin office and practice rooms. These AHUs have one supply fan ranging from 2 to 20 hp and one return fan ranging from 1 to 20 hp.

AHU-G1 is located on roof and serves new gym. This AHU has two 15 hp supply fan and one 10 hp return fan ranging from 1 to 20 hp.

Supply air temperature is reset based on return air (average zone air) temperature. Air is supplied at 66°F when the return air temperature is below 70°F and the supply air setpoint is reset to 55°F when the return air temperature is above 72°F.

Direct Expansion Air Conditioning System (DX)

Seven 15-ton Stulz air source heat pumps (AC-C, F & E series) ranging from 1-ton to 5-ton provide supplemental cooling and heating to various spaces of the building. AC-F3 unit is located in auditorium control room, AC-E1 unit is located in special education room, AC-E2&3 are located in basement MER and AC-C1,2, & 3 are located in video data room. The units utilize a scroll compressor and a direct-expansion (DX) coil. Each unit has a 5-kW electric resistance heating that is used as needed. The units are controlled with the BEMS. However, individual thermostats located in spaces can be used to vary the temperature. Carrier and Stulz direct expansion (DX) packaged units are also used to condition English lab and storage areas. The units operate between 7:00 AM and 5:00 PM Monday through Friday. Refer to the table below for the observed condition of the units.

System Type	Qty	Cooling capacity (Ton)	Heating Capacity (MBH)	Areas Served	Manufacturer	Age (Year)	Current Condition
AC-F2	1	2	-	Elec. Closet	Stulz	12	Good
AC-F3	1	1	12	Various	Stulz	12	Good
AC-E1	1	1	12	Various	Stulz	12	Good
AC-E2	1	2	18.10	TV studio & control room	Stulz	12	Good
AC-E3	1	5	38.90	TV studio	Stulz	12	Good
AC-C1	1	1.5	17.10	Various	Stulz	12	Good
AC-C2 & C3	2	5	38.90	Various	Stulz	12	Good
AC-A1 & A2	2	2	-	Various	Stulz	12	Good
AC-C4	1	1.5	-	Various	Carrier	12	Fair
AC-B1	1	1.5	-	Various	Carrier	12	Fair
AC-D1	1	2	-	Various	Stulz	12	Good

Image 8 DX Units on Roof

The heat pumps are connected to the BEMS and operate based on building occupancy to maintain the zone space temperature setpoint around 72°F (adjustable by tenants via thermostats located in zone).

Building Energy Management System (BEMS)

The majority of the facility is controlled with an automated logic building energy management system (BEMS). The BEMS aggregates the DDC points from throughout the building. Roughly 50% of the building zones are DDC and the remainder have pneumatic controls which are not tied into the BEMS. The system can provide trends for individual DDC points for up to one-year of historical data. BEMS also provide control for the boiler plant and chiller plant.

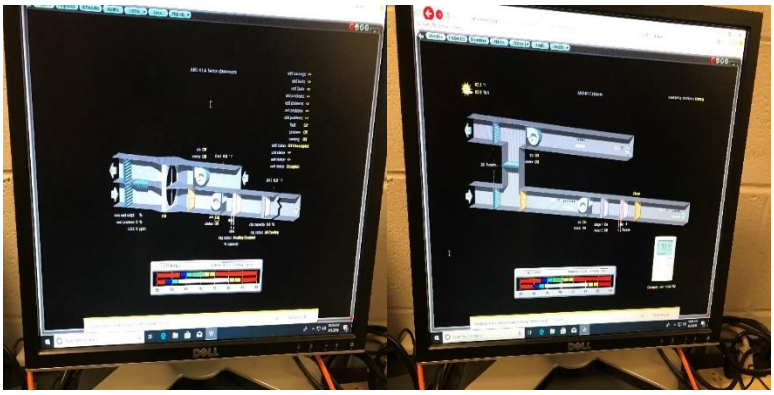


Image 9 BEMS System

Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of one 250-gallon PVI gas fired non-condensing hot water heater with an input rating of 800 kBtu/hr and a nominal efficiency of 83%. Two 500 W Taco recirculation pumps distribute 120°F water to the entire site. The recirculation pumps operate continuously. There are six washing and dryer machines used by the students and kitchen staff. The water heater is eight years old and is in good condition.

Image 10 DHW Heater

There are six washer and dryer units used to laundry clothes of students and kitchen staff clothes.

Food Service & Laundry Equipment

The facility has a full commercial kitchen that is used to prepare lunches for the students. Approximately 500 lunches are prepared every weekday. The ovens, range tops and griddle are all gas fired. There is one 30-gallon steam skillet that is used every day to prepare hot soup. The ovens and griddle are turned on at 9:00 AM when the kitchen staff arrive and turned off at 1:30 PM when lunch service stops. There is a single tank Hobart conveyor dishwasher with an electric fired booster heater that provides 145°F rinse water. The dishwasher operates from noon to 3:00 PM. Steam is supplied to the kitchen equipment from the central steam plant.

Image 11 Kitchen Equipment

Refrigeration

The facility has two different storage refrigeration storage areas: a walk-in units and commercial stand up storage units. The walk-in cooler area is maintained at a constant temperature of 35°F while the walk-in freezer area is maintained at a constant temperature of -5°F. Cooler and freezer area are served by a single evaporator each having a single 1/2 HP fan.

There are six stand up refrigerators with storage capacity of 51.9 cubic feet and two chest type freezers for ice cream and cold beverage storage ranging in capacity from 8.4 to 11.2 cubic feet.

Image 12 Refrigeration Equipment

Building Plug Load

There are roughly 302 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.

There are roughly 10 server closets scattered throughout the facility with cooling provided by dedicated ATS (Advanced technical solutions) units.

The facility has five refrigerated, five non-refrigerated and three glass front refrigerated vending machines to store cold beverage as well as snacks located in various spaces.

2.7 Water-Using Systems

There are 30 restrooms at this facility. A sampling of restrooms found that the faucets are rated for 2.2 gallons per minute (gpm) or higher, the toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at 2 gpf.

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

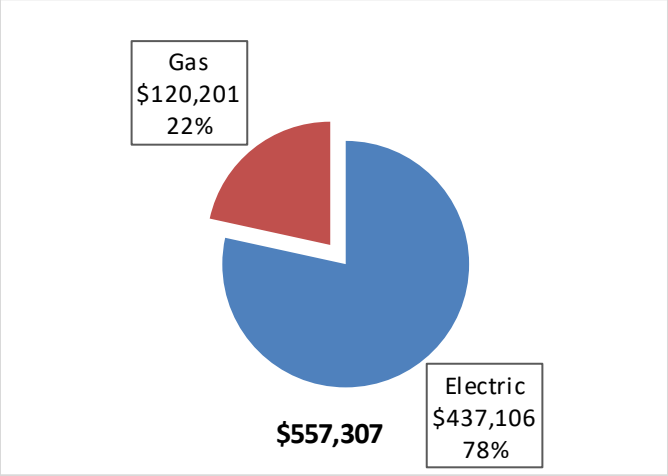
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Princeton High School		
Fuel	**Usage**	**Cost**
Electricity	3,391,508 kWh	$437,106
Natural Gas	158,997 Therms	$120,201
Total		**$557,307**

The current annual energy cost for this facility is $557,307 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost over the past 12 months was $0.129/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 high occupancy in the summer months.

Figure 9 - Electric Usage & Demand

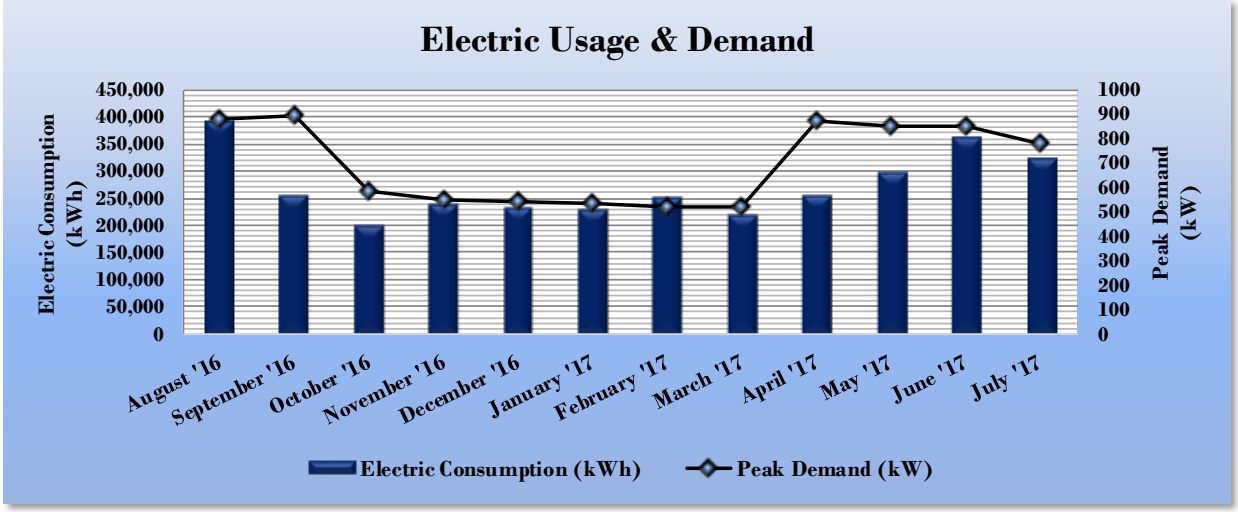


Figure 10 - Electric Usage & Demand

Electric Billing Data for Princeton High School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
9/12/16	31	392,452	882	$1,363	$57,362
10/10/16	27	256,774	895	$1,501	$33,753
11/8/16	28	202,009	585	$1,191	$25,908
12/9/16	30	240,984	549	$1,211	$30,359
1/11/17	32	234,718	541	$1,179	$29,826
2/9/17	28	232,140	533	$1,160	$28,495
3/13/17	31	254,043	517	$1,120	$32,596
4/12/17	29	220,432	520	$1,091	$28,664
5/12/17	30	256,967	870	$1,352	$34,267
6/13/17	31	299,567	854	$1,456	$35,487
7/13/17	29	364,697	847	$1,342	$45,343
8/11/17	27	325,223	778	$968	$40,676
Totals	**353**	**3,280,006**	**894.5**	**$14,933**	**$422,736**
Annual	**365**	**3,391,508**	**894.5**	**$15,440**	**$437,106**

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is $0.756/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 another end uses.

Figure 11 - Natural Gas Usage

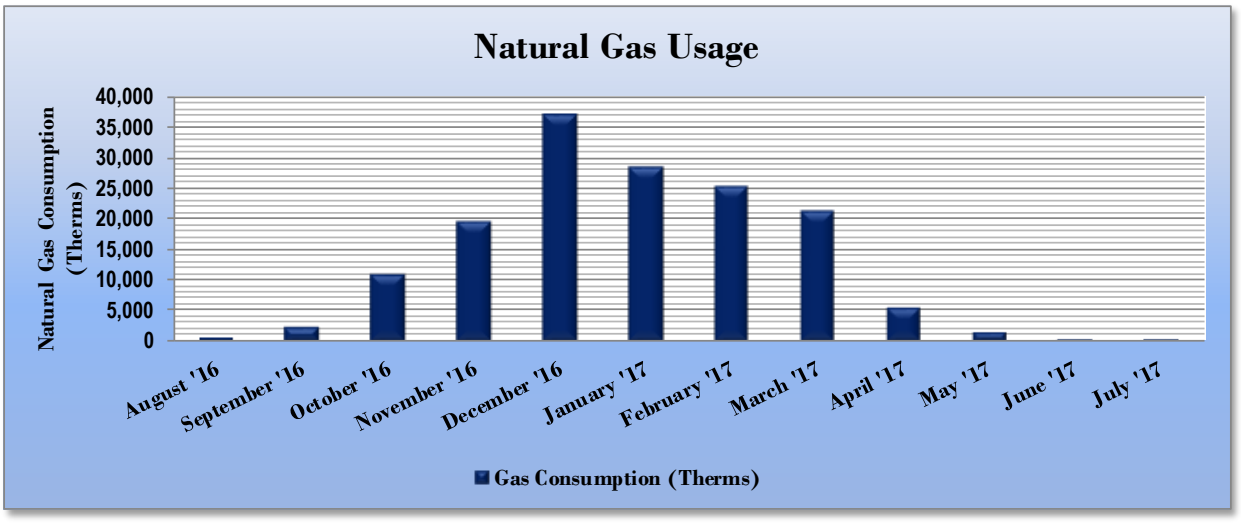


Figure 12 - Natural Gas Usage

Gas Billing Data for Princeton High School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
9/12/16	31	627	$447
10/10/16	27	2,302	$1,360
11/8/16	28	10,965	$10,098
12/9/16	30	19,548	$15,759
1/11/17	32	37,207	$29,508
2/9/17	28	28,433	$23,344
3/13/17	31	25,503	$19,019
4/12/17	28	21,445	$10,845
5/12/17	30	5,534	$5,416
6/12/17	31	1,386	$166
7/12/17	30	469	$151
8/10/17	27	351	$137
Totals	**353**	**153,770**	**$116,249**
Annual	**365**	**158,997**	**$120,201**

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		
	Princeton High School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	181.0	141.4
Site Energy Use Intensity (kBtu/ft^2)	93.8	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		
	Princeton High School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	140.7	141.4
Site Energy Use Intensity (kBtu/ft^2)	80.8	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% of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 30.

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

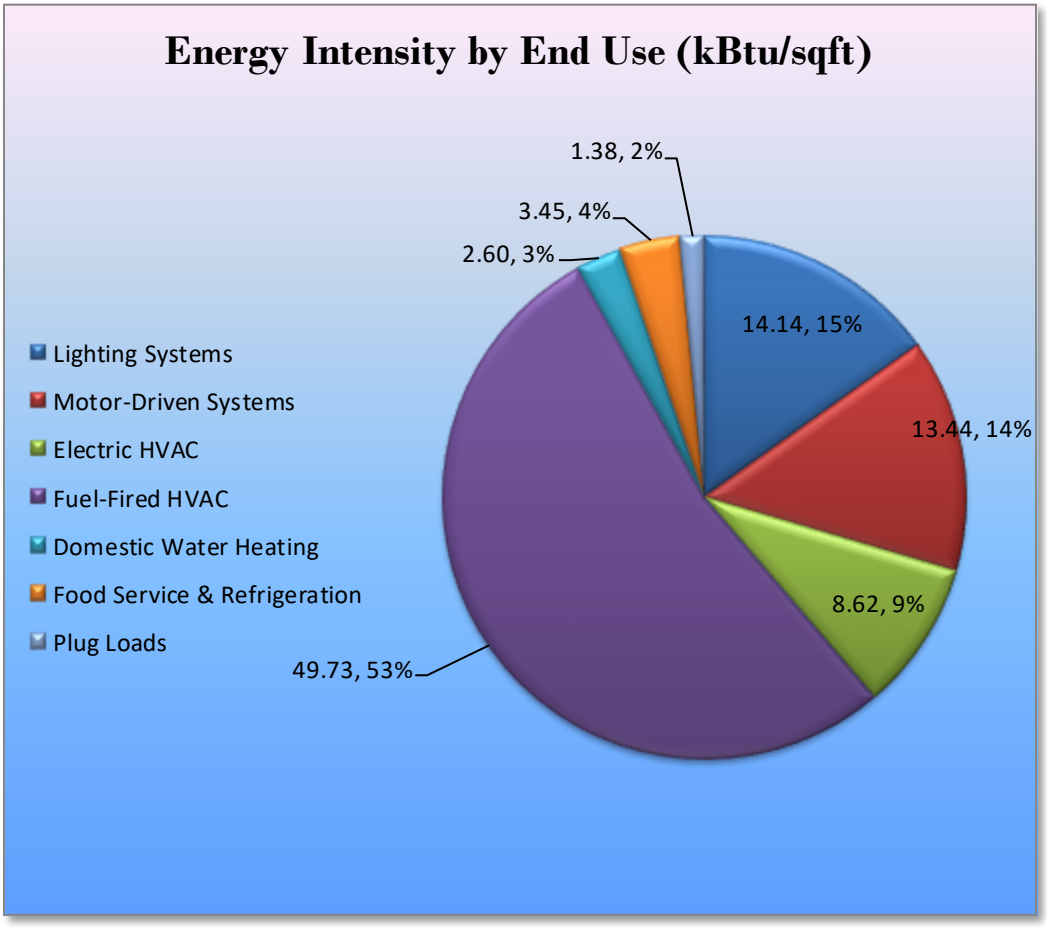
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to Princeton 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		**762,293**	**99.5**	**0.0**	**$98,246.27**	**$297,079.38**	**$59,410.00**	**$237,669.38**	**2.4**	**767,623**
ECM 1	Install LED Fixtures	130,995	16.8	0.0	$16,882.96	$151,102.01	$29,250.00	$121,852.01	7.2	131,911
ECM 2	Retrofit Fixtures with LED Lamps	631,298	82.7	0.0	$81,363.31	$145,977.37	$30,160.00	$115,817.37	1.4	635,712
Lighting Control Measures		**156,106**	**19.8**	**0.0**	**$20,119.40**	**$90,388.00**	**$10,360.00**	**$80,028.00**	**4.0**	**157,198**
ECM 3	Install Occupancy Sensor Lighting Controls	120,825	15.3	0.0	$15,572.24	$86,188.00	$10,360.00	$75,828.00	4.9	121,670
ECM 4	Install High/Low Lighitng Controls	35,281	4.5	0.0	$4,547.16	$4,200.00	$0.00	$4,200.00	0.9	35,528
Variable Frequency Drive (VFD) Measures		**154,302**	**41.2**	**0.0**	**$19,886.82**	**$148,589.00**	**$23,680.00**	**$124,909.00**	**6.3**	**155,381**
ECM 5	Install VFDs on Constant Volume (CV) HVAC	136,387	39.0	0.0	$17,577.87	$130,543.10	$23,680.00	$106,863.10	6.1	137,340
ECM 6	Install VFDs on Boiler Feedwater Pumps	17,915	2.3	0.0	$2,308.95	$18,045.90	$0.00	$18,045.90	7.8	18,040
Domestic Water Heating Upgrade		**0**	**0.0**	**77.9**	**$589.15**	**$372.84**	**$0.00**	**$372.84**	**0.6**	**9,125**
ECM 7	Install Low-Flow Domestic Hot Water Devices	0	0.0	77.9	$589.15	$372.84	$0.00	$372.84	0.6	9,125
Food Service Equipment & Refrigeration Measures		**7,650**	**0.9**	**0.0**	**$985.91**	**$4,488.60**	**$0.00**	**$4,488.60**	**4.6**	**7,703**
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	1,311	0.2	0.0	$168.92	$606.60	$0.00	$606.60	3.6	1,320
ECM 9	Replace Refrigeration Equipment	6,339	0.7	0.0	$816.99	$3,882.00	$0.00	$3,882.00	4.8	6,383
Plug Load Equipment Control - Vending Machine		**13,398**	**0.0**	**0.0**	**$1,726.82**	**$2,990.00**	**$0.00**	**$2,990.00**	**1.7**	**13,492**
ECM 10	Vending Machine Control	13,398	0.0	0.0	$1,726.82	$2,990.00	$0.00	$2,990.00	1.7	13,492
TOTALS		**1,093,749**	**161.5**	**77.9**	**$141,554.38**	**$543,907.82**	**$93,450.00**	**$450,457.82**	**3.2**	**1,110,521**

* - 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		**762,293**	**99.5**	**0.0**	**$98,246.27**	**$297,079.38**	**$59,410.00**	**$237,669.38**	**2.4**	**767,623**
ECM 1	Install LED Fixtures	130,995	16.8	0.0	$16,882.96	$151,102.01	$29,250.00	$121,852.01	7.2	131,911
ECM 2	Retrofit Fixtures with LED Lamps	631,298	82.7	0.0	$81,363.31	$145,977.37	$30,160.00	$115,817.37	1.4	635,712

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	72,742	9.2	0.0	$9,375.17	$111,583.02	$21,600.00	$89,983.02	9.6	73,251
Exterior	58,253	7.6	0.0	$7,507.79	$39,518.99	$7,650.00	$31,868.99	4.2	58,660

Measure Description

We recommend replacing existing fixtures containing 100-Watt and 250-Watt metal halide, 400-Watt mercury vapor lamps in hallways, parking area, auditorium and some classrooms with new high-performance LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of HID sources such as metal halide and mercury vapor.

ECM 2: 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	627,097	82.2	0.0	$80,821.90	$142,563.47	$30,160.00	$112,403.47	1.4	631,482
Exterior	4,201	0.5	0.0	$541.42	$3,413.90	$0.00	$3,413.90	6.3	4,230

Measure Description

We recommend retrofitting existing CFLs, T8 lamps, incandescent and other lighting technologies in classrooms, staff rooms, restrooms and offices 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 ten times longer than many incandescent lamps.

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		**156,106**	**19.8**	**0.0**	**$20,119.40**	**$90,388.00**	**$10,360.00**	**$80,028.00**	**4.0**	**157,198**
ECM 3	Install Occupancy Sensor Lighting Controls	120,825	15.3	0.0	$15,572.24	$86,188.00	$10,360.00	$75,828.00	4.9	121,670
ECM 4	Install High/Low Lighitng Controls	35,281	4.5	0.0	$4,547.16	$4,200.00	$0.00	$4,200.00	0.9	35,528

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 3: 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)
120,825	15.3	0.0	$15,572.24	$86,188.00	$10,360.00	$75,828.00	4.9	121,670

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in restrooms, storage rooms, classrooms and office areas. 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 4: 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)
35,281	4.5	0.0	$4,547.16	$4,200.00	$0.00	$4,200.00	0.9	35,528

Measure Description

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

Lighting fixtures with these controls operate at default low levels when the area is 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. In parking lots with significant ambient lighting this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylighting. 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 Variable Frequency Drive Measures

Our recommendations for variable frequency drive (VFD) measures are summarized in Figure 19 below.

Figure 19 – Summary of Variable Frequency Drive 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)
Variable Frequency Drive (VFD) Measures		**154,302**	**41.2**	**0.0**	**$19,886.82**	**$148,589.00**	**$23,680.00**	**$124,909.00**	**6.3**	**155,381**
ECM 5	Install VFDs on Constant Volume (CV) HVAC	136,387	39.0	0.0	$17,577.87	$130,543.10	$23,680.00	$106,863.10	6.1	137,340
ECM 6	Install VFDs on Boiler Feedwater Pumps	17,915	2.3	0.0	$2,308.95	$18,045.90	$0.00	$18,045.90	7.8	18,040

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

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)
136,387	39.0	0.0	$17,577.87	$130,543.10	$23,680.00	$106,863.10	6.1	137,340

Measure Description

We recommend installing variable frequency drives (VFDs) on AHUs to control supply fan motor speeds to convert a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor if the air handler has one. Zone thermostats will cause the VFD to modulate fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature. Energy savings results from reducing fan speed (and power) when there is a reduced load required for the zone. The magnitude of energy savings is based on the estimated amount of time that fan motors operate at partial load.

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

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

ECM 6: Install VFDs on Boiler Feedwater Pumps

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)
17,915	2.3	0.0	$2,308.95	$18,045.90	$0.00	$18,045.90	7.8	18,040

Measure Description

We recommend installing variable frequency drives (VFD) to control six 3 hp boiler feedwater pumps. The existing level control valve will need to be maintained fully open and its control signal used by the VFD to modulate the feedwater speed. Energy savings results from reducing pump motor speed (and power) at reduced feedwater flow. The magnitude of energy savings is based on the estimated amount of time that the pumping system will operate at reduced load.

4.1.4 Domestic Hot Water Heating System Upgrades

Our recommendation for domestic water heating system improvements is 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**	**77.9**	**$589.15**	**$372.84**	**$0.00**	**$372.84**	**0.6**	**9,125**
ECM 7	Install Low-Flow Domestic Hot Water Devices	0	0.0	77.9	$589.15	$372.84	$0.00	$372.84	0.6	9,125

ECM 7: 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	77.9	$589.15	$372.84	$0.00	$372.84	0.6	9,125

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 providing 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		**7,650**	**0.9**	**0.0**	**$985.91**	**$4,488.60**	**$0.00**	**$4,488.60**	**4.6**	**7,703**
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors	1,311	0.2	0.0	$168.92	$606.60	$0.00	$606.60	3.6	1,320
ECM 9	Replace Refrigeration Equipment	6,339	0.7	0.0	$816.99	$3,882.00	$0.00	$3,882.00	4.8	6,383

ECM 8: Refrigerator/Freezer Case Electrically Commutated Motors

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)
1,311	0.2	0.0	$168.92	$606.60	$0.00	$606.60	3.6	1,320

Measure Description

We recommend replacing shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in existing walk-in coolers and freezers. These fractional horsepower EC motors are significantly more efficient than mechanically commutated, brushed motors, particularly at low speeds or partial load. By employing variable-speed technology, EC motors are able to optimize fan usage. Because these motors are brushless and utilize DC power, losses due to friction and phase shifting are eliminated. Savings for this measure take into account both the increased efficiency of the motor as well as the reduction in refrigeration load due to motor heat loss.

ECM 9: Replace Refrigeration Equipment

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)
6,339	0.7	0.0	$816.99	$3,882.00	$0.00	$3,882.00	4.8	6,383

Measure Description

We recommend replacing existing two chest freezers with new ENERGY STAR® high efficiency equipment. There have been many improvements in refrigeration system equipment, operation, and insulation. The energy savings associated with this measure come from reduced energy usage, due to more efficient technology, and reduced run times.

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		**13,398**	**0.0**	**0.0**	**$1,726.82**	**$2,990.00**	**$0.00**	**$2,990.00**	**1.7**	**13,492**
ECM 10	Vending Machine Control	13,398	0.0	0.0	$1,726.82	$2,990.00	$0.00	$2,990.00	1.7	13,492

ECM 10: 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)
13,398	0.0	0.0	$1,726.82	$2,990.00	$0.00	$2,990.00	1.7	13,492

Measure Description

Vending machines operate continuously, even during non-business hours. We recommend installing 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.

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)
Motor Upgrades	**14,550**	**3.6**	**0.0**	**$1,875.23**	**$55,493.51**	**$0.00**	**$55,493.51**	**29.6**	**14,652**
Premium Efficiency Motors	14,550	3.6	0.0	$1,875.23	$55,493.51	$0.00	$55,493.51	29.6	14,652
Electric Unitary HVAC Measures	**54,228**	**33.5**	**0.0**	**$6,989.09**	**$495,234.64**	**$15,278.00**	**$479,956.64**	**68.7**	**54,608**
Install High Efficiency Electric AC	46,567	27.6	0.0	$6,001.62	$448,720.96	$13,392.00	$435,328.96	72.5	46,892
Install High Efficiency Heat Pumps	7,662	5.9	0.0	$987.48	$46,513.68	$1,886.00	$44,627.68	45.2	7,715
HVAC System Improvements	**71,283**	**16.1**	**0.0**	**$9,187.14**	**$11,550.00**	**$2,750.00**	**$8,800.00**	**1.0**	**71,781**
Install Dual Enthalpy Outside Economizer Control	71,283	16.1	0.0	$9,187.14	$11,550.00	$2,750.00	$8,800.00	1.0	71,781
TOTALS	**140,061**	**53.2**	**0.0**	**$18,051.46**	**$562,278.15**	**$18,028.00**	**$544,250.15**	**30.1**	**141,041**

* - 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).

Premium Efficiency Motors

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)
14,550	3.6	0.0	$1,875.23	$55,493.51	$0.00	$55,493.51	29.6	14,652

Measure Description

We recommend replacing standard efficiency AHUs and 25 hp boiler combustion fan motors with NEMA Premium® efficiency motors. Our evaluation assumes that existing motors will be replaced with motors of equivalent size and type. Although occasionally additional savings can be achieved by downsizing motors to better meet the motor's current load requirements. The base case motor efficiencies are estimated from nameplate information and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings (2016)*. Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours.

Reasons for not Recommending

Replacing the motors has a long payback period and may not be justifiable based simply on energy considerations. However, the motors are nearing their normal useful life. Typically, the marginal cost of purchasing a high efficiency motors can be justified by the marginal savings from the improved efficiency. When the motors are eventually replaced, consider purchasing NEMA Premium® motors that exceeds the minimum efficiency required.

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)
46,567	27.6	0.0	$6,001.62	$448,720.96	$13,392.00	$435,328.96	72.5	46,892

Measure Description

We recommend replacing standard efficiency packaged air conditioning units with high efficiency packaged 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

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

Install High Efficiency Heat Pumps

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)
7,662	5.9	0.0	$987.48	$46,513.68	$1,886.00	$44,627.68	45.2	7,715

Measure Description

We recommend replacing standard efficiency heat pumps with high efficiency heat pumps. 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 and a higher HPSF rating indicates more efficient heating mode. 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 heating and cooling loads, and the estimated annual operating hours.

Reasons for not Recommending

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

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)
71,283	16.1	0.0	$9,187.14	$11,550.00	$2,750.00	$8,800.00	1.0	71,781

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.

Reasons for not Recommending

Installing dual enthalpy economizers on existing AHU units will result in energy savings, however, the cost of installation associated with ECM – high efficiency air conditioning units will outweigh the energy saving advantages resulting in a very long payback. This makes the measure financially not viable therefore not recommended based on 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.

Perform Proper Lighting Maintenance

In order to sustain optimal lighting levels, lighting fixtures should undergo routine maintenance. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust on lamps, fixtures and reflective surfaces. Together, these factors can reduce total illumination by 20% - 60% or more, while operating fixtures continue drawing full power. To limit this reduction, lamps, reflectors and diffusers should be thoroughly cleaned of dirt, dust, oil, and smoke film buildup approximately every 6 – 12 months.

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°F-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.

Assess Chillers & Request Tune-Ups

Chillers are responsible for a substantial portion of a commercial building's overall energy usage. When components of a chiller are not optimized, this can quickly result in a noticeable increase in energy bills. Chiller diagnostics can produce a 5% to 10% cost avoidance potential from discovery and implementation of low/no cost optimization strategies.

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.

Clean and/or Replace HVAC Filters

Air filters work to reduce the amount of indoor air pollution and increase occupant comfort. Over time, filters become less, and less effective as particulate buildup increases. In addition to health concerns related to clogged filters, filters that have reached saturation also restrict air flow through the facility's air conditioning or heat pump system, increasing the load on the distribution fans and decreasing occupant comfort levels. Filters should be checked monthly and cleaned or replaced when appropriate.

Repair/Replace Steam Traps

Properly functioning steam traps ensure that all latent heat in the steam is delivered to the end use by preventing pressurized steam from leaking. Steam traps should be inspected as part of the regular steam system maintenance. Traps that are blocked, venting, or allowing steam to leak through should be repaired or replaced. Repairing or replacing existing steam traps will reduce steam losses.

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.

Perform Proper Water Heater Maintenance

At least once a year, drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Once a year check for any leaks or heavy corrosion on the pipes and valves. For gas water heaters, check the draft hood and make sure it is placed properly, with a few inches of air space between the tank and where it connects to the vent. Look for any corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional. For electric water heaters, look for any signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank. For water heaters over three to four years old have a technician inspect the sacrificial anode annually.

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 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.

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.

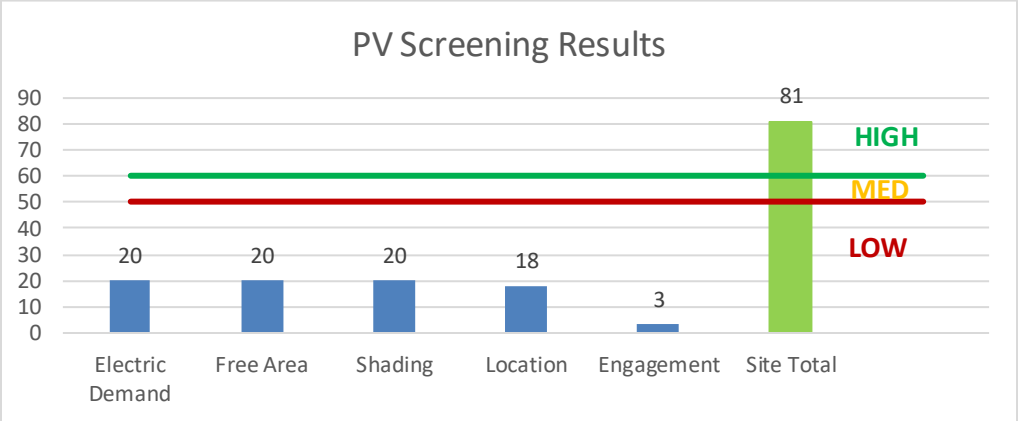
6.1 Photovoltaic

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 **High** potential for installing a PV array.

There is an estimated amount of 45,500 square feet of free area, ease of installation (roof), and the lack of shading elements contribute to the high potential for PV at this site. A PV array located on the roof of the main building may be feasible. If Princeton High School is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 24 - Photovoltaic Screening



Potential	High	
System Potential	488	kW DC STC
Electric Generation	581,389	kWh/yr
Displaced Cost	$50,580	/yr
Installed Cost	$1,268,800	

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.

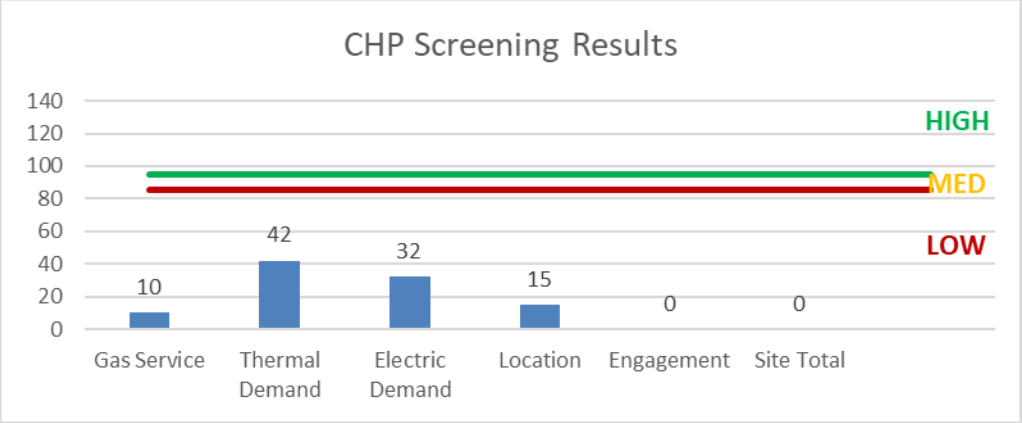
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste 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 no potential for installing a cost-effective CHP system.

The magnitude, type, and duration of the thermal demand, the coincident electric load, and the ease of interconnection contribute to the potential for CHP at the site. Based on the amount of steam used throughout the year and the concurrent electric demand a fuel cell may be feasible. If Princeton High School is interested in pursuing the installation of CHP, we recommended a more detailed feasibility study be conducted.

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.

Princeton High School is not a good candidate for DR curtailment.

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			X		
ECM 2	Retrofit Fixtures with LED Lamps	X			X		
ECM 3	Install Occupancy Sensor Lighting Controls	X			X		
ECM 4	Install High/Low Lighitng Controls				X		
ECM 5	Install VFDs on Constant Volume (CV) HVAC	X			X		
ECM 6	Install VFDs on Boiler Feedwater Pumps				X		
ECM 7	Install Low-Flow Domestic Hot Water Devices	X			X		
ECM 8	Refrigerator/Freezer Case Electrically Commutated Motors				X		
ECM 9	Replace Refrigeration Equipment				X		
ECM 10	Vending Machine Control				X		

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 Pay for Performance - Existing Buildings

Overview

The Pay for Performance – Existing Buildings (P4P EB) program is designed for larger customers with a peak demand over 200 kW in any of the preceding 12 months. Under this program the minimum installed scope of work must include at least two unique measures resulting in at least 15% energy savings, where lighting cannot make up the majority of the savings. P4P is a generally a good option for medium to large sized facilities looking to implement as many measures as possible under a single project in order to achieve deep energy savings. This program has an added benefit of evaluating a broad spectrum of measures that may not otherwise qualify under other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also utilize the P4P program.

Incentives

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

How to Participate

To participate in the P4B EB program you will need to contact one of the pre-approved consultants and contractors ("Partners"). Under direct contract to you, the Partner will help further evaluate the measures identified in this report through development of the Energy Reduction Plan (ERP), assist you in implementing selected measures, and verify actual savings one year after the installation. At each of these three milestones your Partner will also facilitate securing program incentives.

Approval of the final scope of work is required by the program prior to installation completion. Although installation can be accomplished by a contractor of your choice (some P4P Partners are also contractors) or by internal personnel, the Partner must remain involved to ensure compliance with the program guidelines and requirements.

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

8.3 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. SRECs 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 SRECs 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.

8.4 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 description 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
Room 81	9	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	9	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,142	0.23	1,807	0.0	$232.88	$922.14	$35.00	3.81
Room 102	12	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	3,142	0.31	2,409	0.0	$310.51	$1,409.52	$70.00	4.31
Exterior	9	Metal Halide: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	9	LED - Fixtures: High-Bay	Daylight Dimming	75	4,380	1.30	9,973	0.0	$1,285.38	$6,973.94	$1,350.00	4.38
PA Parking	10	Metal Halide: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	10	LED - Fixtures: High-Bay	Daylight Dimming	75	4,380	1.44	11,081	0.0	$1,428.20	$7,748.82	$1,500.00	4.38
ED Parking	21	Metal Halide: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	21	LED - Fixtures: High-Bay	Daylight Dimming	75	4,380	3.03	23,271	0.0	$2,999.22	$16,272.52	$3,150.00	4.38
Main Office Parking	8	Metal Halide: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	8	LED - Fixtures: High-Bay	Daylight Dimming	75	4,380	1.15	8,865	0.0	$1,142.56	$6,199.06	$1,200.00	4.38
Room 277	1	Metal Halide: (1) 100W Lamp	Wall Switch	128	4,488	Fixture Replacement	Yes	1	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,142	0.07	552	0.0	$71.18	$890.88	$150.00	10.41
Room 100	1	Metal Halide: (1) 100W Lamp	Wall Switch	128	4,488	Fixture Replacement	Yes	1	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,142	0.07	552	0.0	$71.18	$890.88	$150.00	10.41
148.5	3	Metal Halide: (1) 100W Lamp	Wall Switch	128	4,488	Fixture Replacement	Yes	3	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,142	0.21	1,657	0.0	$213.53	$2,544.65	$485.00	9.65
148.5	8	Metal Halide: (1) 100W Lamp	Wall Switch	128	4,488	Fixture Replacement	Yes	8	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,142	0.56	4,418	0.0	$569.40	$6,419.06	$1,235.00	9.10
Room 200	12	Metal Halide: (1) 100W Lamp	Wall Switch	128	4,488	Fixture Replacement	Yes	12	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,142	0.84	6,627	0.0	$854.10	$9,738.59	$1,870.00	9.21
Library	71	Metal Halide: (1) 100W Lamp	Wall Switch	128	4,488	Fixture Replacement	Yes	71	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,142	4.98	39,210	0.0	$5,053.44	$56,556.63	$10,895.00	9.04
Ground Fl Hallway	42	Metal Halide: (1) 100W Lamp	Wall Switch	128	4,488	Fixture Replacement	Yes	42	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,142	2.95	23,194	0.0	$2,989.36	$32,765.05	$6,335.00	8.84
Exterior	3	Mercury Vapor: (1) 400W Lamp	Daylight Dimming	455	4,380	Fixture Replacement	No	3	LED - Fixtures: High-Bay	Daylight Dimming	120	4,380	0.66	5,062	0.0	$652.43	$2,324.65	$450.00	2.87
Ground Fl Hallway	6	Mercury Vapor: (1) 100W Lamp	Wall Switch	125	4,488	Fixture Replacement	Yes	6	LED - Fixtures: High-Bay	Occupancy Sensor	30	3,142	0.41	3,221	0.0	$415.08	$4,869.29	$935.00	9.48
Room 207	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,488	0.04	289	0.0	$37.25	$73.03	$20.00	1.42
Trailer Men Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,488	0.04	289	0.0	$37.25	$73.03	$20.00	1.42
Trailer Women Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,488	0.04	289	0.0	$37.25	$73.03	$20.00	1.42
Janitor Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	4,488	0.04	289	0.0	$37.25	$73.03	$20.00	1.42
Men Gf	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.10	758	0.0	$97.65	$416.06	$75.00	3.49
Room 18E	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.10	758	0.0	$97.65	$416.06	$75.00	3.49
Room 16	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.10	758	0.0	$97.65	$416.06	$75.00	3.49
Room 201.1	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.14	1,136	0.0	$146.47	$489.09	$95.00	2.69
Trailer	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.19	1,515	0.0	$195.30	$562.12	$115.00	2.29
Room 176	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.29	2,273	0.0	$292.95	$708.18	$155.00	1.89

	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 201	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.34	2,652	0.0	$341.77	$1,051.21	$210.00	2.46
Room 142	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.58	4,546	0.0	$585.90	$1,416.36	$310.00	1.89
Room 141	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.58	4,546	0.0	$585.90	$1,416.36	$310.00	1.89
Room 144	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.58	4,546	0.0	$585.90	$1,416.36	$310.00	1.89
Fitness Center	24	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	114	3,142	Relamp	No	24	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	3,142	0.88	4,856	0.0	$625.81	$1,752.72	$480.00	2.03
Ground Fl Hallway	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	4,488	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,142	0.14	1,136	0.0	$146.47	$419.09	$60.00	2.45
Room 102I	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 102	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 105.2	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 105.20	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 105.18	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 105.16	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 105.14	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 105.10	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 34	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 92.6	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 92.3	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	4,488	0.03	255	0.0	$32.93	$54.77	$15.00	1.21
Room 279	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
270 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$30.00	4.20
Room 283B	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
183 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$30.00	4.20
Room 100.3	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 100.5	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 112	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 102.4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78

	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 102.6	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 102.5	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 102.8	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 105.12	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 105.4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 105.6	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 105.8	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 105.13	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 105.11	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 105.12	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 91.2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 246.1	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.12	968	0.0	$124.82	$434.32	$80.00	2.84
Room 258	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.12	968	0.0	$124.82	$434.32	$80.00	2.84
Room 98.2	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.12	968	0.0	$124.82	$434.32	$80.00	2.84
Pe Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.12	968	0.0	$124.82	$434.32	$80.00	2.84
Room 94.2	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.12	968	0.0	$124.82	$434.32	$80.00	2.84
Room 279.4	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 234	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 245	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 287.1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 188.2	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 188.1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
160.5	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 105.1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 90.1	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37

	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 94	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 162	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.21	1,614	0.0	$208.04	$543.86	$110.00	2.09
Room 100.4	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.21	1,614	0.0	$208.04	$543.86	$110.00	2.09
Nurses Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.21	1,614	0.0	$208.04	$543.86	$110.00	2.09
Room 135	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 145	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 60.3	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 232	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 246	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 254	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 256	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 131	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 98.4	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 63	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 209	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 263	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 267	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 273	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 134	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 132.1	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 153	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 161	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 163	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 164	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58
Room 100	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.37	2,905	0.0	$374.47	$762.95	$170.00	1.58

	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 186	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.41	3,228	0.0	$416.08	$1,087.73	$220.00	2.09
Room 242	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 252	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 268	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 182	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 143	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 155	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 160	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 165	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 166	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 83	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Kitchen 64	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.49	3,874	0.0	$499.29	$1,197.27	$250.00	1.90
Room 280	14	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	14	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.57	4,520	0.0	$582.51	$1,306.82	$280.00	1.76
Room 271	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.62	4,842	0.0	$624.11	$1,361.59	$295.00	1.71
Room 270	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.62	4,842	0.0	$624.11	$1,361.59	$295.00	1.71
Room 180	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.62	4,842	0.0	$624.11	$1,361.59	$295.00	1.71
Room 170	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.62	4,842	0.0	$624.11	$1,361.59	$295.00	1.71
Room 171	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.62	4,842	0.0	$624.11	$1,361.59	$295.00	1.71
Room 85	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.62	4,842	0.0	$624.11	$1,361.59	$295.00	1.71
Room 282	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.66	5,165	0.0	$665.72	$1,416.36	$310.00	1.66
Room 285	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.66	5,165	0.0	$665.72	$1,416.36	$310.00	1.66
Room 283	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.66	5,165	0.0	$665.72	$1,416.36	$310.00	1.66
Room 185	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.66	5,165	0.0	$665.72	$1,416.36	$310.00	1.66
Room 183	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.74	5,811	0.0	$748.94	$1,525.91	$340.00	1.58
Room 91	19	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	19	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.78	6,134	0.0	$790.54	$1,580.68	$355.00	1.55

	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 93	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.82	6,457	0.0	$832.15	$1,635.45	$370.00	1.52
Room 91	20	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	20	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.82	6,457	0.0	$832.15	$1,635.45	$370.00	1.52
Room 82	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	4,488	Relamp	Yes	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	3,142	0.90	7,102	0.0	$915.37	$1,745.00	$400.00	1.47
272C.1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
272C.2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
284C.3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 279	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Custodian Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 280	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 280A	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 174.1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
148.1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 160	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 100.3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 100.4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 112	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
190 Custodian	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 96.5	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 93C	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Condensate Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 92.3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 86.5	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 86.4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21

	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 81.1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Electrical Room 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
G11 Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 60C	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Room 61.1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Office Toilet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Office Toilet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
Office Toilet 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.02	170	0.0	$21.95	$36.52	$10.00	1.21
251C	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 279.3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 234	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 287.2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 182	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 171.2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 174.2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
1St Fl Girls	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$343.03	$55.00	5.19
1St Fl Girls 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$343.03	$55.00	5.19
148.5	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
1St Fl Boys	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 155.1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 100.6	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 102J	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 103.1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 105.95	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 96.2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05

	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 96.1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
B98	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 18E	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 16	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 14D	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 35	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 95C	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 86.3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 91.6	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 91.5	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 91.4	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 92.6	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 91.3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 92.3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 92.1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 83	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 82.2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Room 82.1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
81 Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$189.03	$20.00	3.05
Cafeteria Girls	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$343.03	$55.00	5.19
Cafeteria Men	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.05	430	0.0	$55.48	$343.03	$55.00	5.19
G12	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 230C	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 245	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78

	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 255.1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 257	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 277.1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
2Nd Fl Girls 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
2Nd Fl Boys 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
2Nd Fl Women 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Women 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 184C	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
185 Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$30.00	4.20
1St Fl Men 2	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
1St Fl Men 3	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
86.1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 85	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Ground Floor Girls	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Ground Floor Boys	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room G11	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 64.3	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 64.1	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Room 60.4	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Nurses Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.08	646	0.0	$83.22	$379.55	$65.00	3.78
Electrical Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$40.00	3.39
2Nd Fl Boys	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 280.1	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 283A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 288	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07

	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
1St Fl Women	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 182	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Library	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 151	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 150	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 167	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 195	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 96.4	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 18A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 14A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Elevator Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$40.00	3.39
97 Tech. Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 33	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 34	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 34A	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Gf Boys	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Gf Girls	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 93.4	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 92.1	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 92.9	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 93.2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 92.8	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 92.7	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
Room 82.3	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.11	861	0.0	$110.95	$416.06	$75.00	3.07
2Nd Fl Girls	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.14	1,076	0.0	$138.69	$452.58	$85.00	2.65

	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
2Nd Fl Boys 3	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.14	1,076	0.0	$138.69	$452.58	$85.00	2.65
2Nd Fl Girls 3	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.14	1,076	0.0	$138.69	$452.58	$85.00	2.65
Room 178	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.14	1,076	0.0	$138.69	$452.58	$85.00	2.65
Room 96.3	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.14	1,076	0.0	$138.69	$452.58	$85.00	2.65
Stage	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	High/Low Control	62	3,142	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,142	0.11	596	0.0	$76.83	$182.58	$50.00	1.73
Room G10	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.14	1,076	0.0	$138.69	$452.58	$85.00	2.65
Room 202	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 270.2	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 136C	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
170.2	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 140	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 92.11	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 93.3	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
91 Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Media Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	High/Low Control	62	3,142	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,142	0.13	715	0.0	$92.20	$219.09	$60.00	1.73
Old Boiler Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,488	0.13	1,022	0.0	$131.71	$219.09	$60.00	1.21
Garage 70.3	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.16	1,291	0.0	$166.43	$489.09	$95.00	2.37
Room 234	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.19	1,507	0.0	$194.17	$525.61	$105.00	2.17
Room 102	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.19	1,507	0.0	$194.17	$525.61	$105.00	2.17
Room 205	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01
Room 276	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01
Room 274	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01
Room 272	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01
Room 18B	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01
Room 14B	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01

	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 14C	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01
Ground Floor Men	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01
Room 73	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.22	1,722	0.0	$221.91	$562.12	$115.00	2.01
Room 240	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 265	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 134.1	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 133	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 132.1	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 71	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.25	1,937	0.0	$249.65	$598.64	$125.00	1.90
Room 286	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.27	2,152	0.0	$277.38	$635.15	$135.00	1.80
Library	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.27	2,152	0.0	$277.38	$635.15	$135.00	1.80
Room 18C	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.27	2,152	0.0	$277.38	$635.15	$135.00	1.80
97-98 Hallway	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,142	0.27	2,152	0.0	$277.38	$565.15	$100.00	1.68
Room 34	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.27	2,152	0.0	$277.38	$635.15	$135.00	1.80
Room 204	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.30	2,367	0.0	$305.12	$671.67	$145.00	1.73
Room 237	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 241	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 244	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 247	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 255	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 262	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 264	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 266	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Room 146	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66
Kitchen 64	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.33	2,583	0.0	$332.86	$708.18	$155.00	1.66

	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 173	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.38	3,013	0.0	$388.34	$781.21	$175.00	1.56
Room 107	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.38	3,013	0.0	$388.34	$781.21	$175.00	1.56
Ground Floor Women	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.38	3,013	0.0	$388.34	$781.21	$175.00	1.56
Room 154	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.41	3,228	0.0	$416.08	$817.73	$185.00	1.52
Room 203	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.44	3,444	0.0	$443.81	$854.24	$195.00	1.49
2Nd Fl Hallway	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,142	0.44	3,444	0.0	$443.81	$784.24	$160.00	1.41
Room 86	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.46	3,659	0.0	$471.55	$890.76	$205.00	1.45
Boiler Room	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.49	3,874	0.0	$499.29	$927.27	$215.00	1.43
Room B98.4	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.49	3,874	0.0	$499.29	$927.27	$215.00	1.43
Chiller Room	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.52	4,089	0.0	$527.03	$963.79	$225.00	1.40
Room 287	19	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.52	4,089	0.0	$527.03	$963.79	$225.00	1.40
Room 206	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.55	4,304	0.0	$554.77	$1,000.30	$235.00	1.38
Room 233	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.55	4,304	0.0	$554.77	$1,000.30	$235.00	1.38
Room 172	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.55	4,304	0.0	$554.77	$1,000.30	$235.00	1.38
Room 174	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.55	4,304	0.0	$554.77	$1,000.30	$235.00	1.38
97 Tech, Office	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.55	4,304	0.0	$554.77	$1,000.30	$235.00	1.38
Room 208	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.60	4,735	0.0	$610.24	$1,073.33	$255.00	1.34
Library	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.60	4,735	0.0	$610.24	$1,073.33	$255.00	1.34
Room 152	31	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	31	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.85	6,672	0.0	$859.89	$1,401.97	$345.00	1.23
Trailer	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	0.87	6,887	0.0	$887.63	$1,438.48	$355.00	1.22
B96	39	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	39	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	1.07	8,394	0.0	$1,081.80	$1,694.09	$425.00	1.17
Room B97	39	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	39	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,142	1.07	8,394	0.0	$1,081.80	$1,694.09	$425.00	1.17
Ground Fl Hallway	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	4,488	Relamp	Yes	22	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,142	0.60	4,735	0.0	$610.24	$1,003.33	$220.00	1.28
102 Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,488	0.01	90	0.0	$11.64	$18.26	$5.00	1.14
Women Gf	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,488	0.01	90	0.0	$11.64	$18.26	$5.00	1.14

	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 G10	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	4,488	0.01	90	0.0	$11.64	$18.26	$5.00	1.14
Room 277	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,142	0.04	338	0.0	$43.60	$170.77	$15.00	3.57
B96 Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	Yes	3	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,142	0.04	338	0.0	$43.60	$170.77	$15.00	3.57
Elevator	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,142	0.06	451	0.0	$58.14	$189.03	$20.00	2.91
Room 251	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	3,142	0.09	677	0.0	$87.21	$379.55	$65.00	3.61
2Nd Fl Hallway	191	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	Yes	191	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,142	2.74	21,539	0.0	$2,776.07	$3,687.18	$955.00	0.98
1St Fl Hallway	223	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	Yes	223	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,142	3.19	25,148	0.0	$3,241.17	$4,271.42	$1,115.00	0.97
Ground Fl Hallway	113	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	4,488	Relamp	Yes	113	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	3,142	1.62	12,743	0.0	$1,642.38	$2,263.10	$565.00	1.03
Room 105.95	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,488	0.02	142	0.0	$18.29	$48.77	$15.00	1.85
Room 91	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,488	0.02	142	0.0	$18.29	$48.77	$15.00	1.85
Room 91	1	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	4,488	0.02	142	0.0	$18.29	$48.77	$15.00	1.85
Media Room	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	High/Low Control	53	3,142	Relamp	No	2	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	3,142	0.04	199	0.0	$25.61	$97.55	$30.00	2.64
Room 82	2	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	2	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,142	0.05	363	0.0	$46.76	$213.55	$30.00	3.93
Room 105.5	4	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,142	0.09	726	0.0	$93.53	$465.09	$95.00	3.96
108.2 Cot	5	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	5	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,142	0.12	907	0.0	$116.91	$513.86	$110.00	3.45
Room 94.1	6	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Occupancy Sensor	53	3,142	Relamp	No	6	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,142	0.11	596	0.0	$76.83	$292.64	$90.00	2.64
Room 85	6	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	6	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,142	0.14	1,088	0.0	$140.29	$562.64	$125.00	3.12
Room 83	7	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	7	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,142	0.16	1,270	0.0	$163.67	$611.41	$140.00	2.88
Kitchen 64	8	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	8	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,142	0.18	1,451	0.0	$187.05	$660.18	$155.00	2.70
Room 102	26	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	26	LED - Linear Tubes: (3) 2' Lamps	Occupancy Sensor	26	3,142	0.60	4,717	0.0	$607.92	$1,538.09	$425.00	1.83
Cafeteria	92	Linear Fluorescent - T8: 2' T8 (17W) - 3L	High/Low Control	53	3,142	Relamp	No	92	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	3,142	1.66	9,140	0.0	$1,178.05	$4,487.07	$1,380.00	2.64
2Nd Fl Hallway	4	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	3,142	0.09	726	0.0	$93.53	$395.09	$60.00	3.58
1St Fl Hallway	4	Linear Fluorescent - T8: 2' T8 (17W) - 3L	Wall Switch	53	4,488	Relamp	Yes	4	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	3,142	0.09	726	0.0	$93.53	$395.09	$60.00	3.58
Room 204	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
2Nd Fl. Women	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12

	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
2Nd Fl Men	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
2Nd Fl Girls 2	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
2Nd Fl Boys 2	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
2Nd Fl Men 2	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Room 286	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
1St Fl Men	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
1St Fl Women	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Room 186	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Men Faculty	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
1St Fl Women 2	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
1St Fl Women 3	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Room 160	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
160.5	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
105 Women	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
105 Men	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Closet	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Occupancy Sensor	33	3,142	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,142	0.01	58	0.0	$7.45	$32.52	$10.00	3.02
Room 96.4	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Gf Boys	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Gf Girls	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Room 92C	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Ground Floor Women	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Room 94.3	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
94 Bathroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Ground Floor Girls	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Ground Floor Boys	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12

	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
Cafeteria Girls	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Cafeteria Men	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Room 152	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,142	0.03	218	0.0	$28.07	$181.03	$20.00	5.74
Room 162	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,142	0.03	218	0.0	$28.07	$181.03	$20.00	5.74
Room 167	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,142	0.03	218	0.0	$28.07	$181.03	$20.00	5.74
1St Fl Men	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,142	0.06	436	0.0	$56.14	$400.06	$75.00	5.79
160.4	4	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	Yes	4	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,142	0.06	436	0.0	$56.14	$246.06	$40.00	3.67
148.5	6	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	Yes	6	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	3,142	0.08	653	0.0	$84.21	$465.09	$95.00	4.39
Ground Fl Hallway	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	4,488	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,488	0.01	83	0.0	$10.64	$32.52	$10.00	2.12
Gym 99	36	LED - Fixtures: High-Bay	Occupancy Sensor	270	3,142	None	No	36	LED - Fixtures: High-Bay	Occupancy Sensor	270	3,142	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 98.5	6	LED - Fixtures: Ambient - 4' - Indirect/Direct Fixture	Wall Switch	39	4,488	None	Yes	6	LED - Fixtures: Ambient - 4' - Indirect/Direct Fixture	Occupancy Sensor	39	3,142	0.05	362	0.0	$46.70	$270.00	$35.00	5.03
Room 98.4	8	LED - Fixtures: Ambient - 4' - Indirect/Direct Fixture	Wall Switch	39	4,488	None	Yes	8	LED - Fixtures: Ambient - 4' - Indirect/Direct Fixture	Occupancy Sensor	39	3,142	0.06	483	0.0	$62.26	$270.00	$35.00	3.77
Room 96.5	10	LED - Fixtures: Ambient - 4' - Indirect/Direct Fixture	Occupancy Sensor	39	3,142	None	No	10	LED - Fixtures: Ambient - 4' - Indirect/Direct Fixture	Occupancy Sensor	39	3,142	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym 096	24	LED - Fixtures: Ambient - 4' - Direct/Indirect Fixture	Occupancy Sensor	39	3,142	None	No	24	LED - Fixtures: Ambient - 4' - Direct/Indirect Fixture	Occupancy Sensor	39	3,142	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 98.3	2	Incandescent: BULB	Wall Switch	100	4,488	Relamp	Yes	2	LED - Fixtures: Other	Occupancy Sensor	15	3,142	0.12	924	0.0	$119.07	$335.04	$35.00	2.52
Room 105.12	3	Incandescent: BULB	Wall Switch	100	4,488	Relamp	Yes	3	LED - Fixtures: Other	Occupancy Sensor	15	3,142	0.18	1,386	0.0	$178.60	$367.56	$35.00	1.86
Room 200	14	Incandescent: BULB	Wall Switch	100	4,488	Relamp	Yes	14	LED - Fixtures: Other	Occupancy Sensor	15	3,142	0.82	6,467	0.0	$833.48	$995.28	$70.00	1.11
Room 92.1	52	Incandescent: BULB	Wall Switch	100	4,488	Relamp	Yes	52	LED - Fixtures: Other	Occupancy Sensor	15	3,142	3.05	24,020	0.0	$3,095.79	$3,041.04	$175.00	0.93
Room 92.8	52	Incandescent: BULB	Wall Switch	100	4,488	Relamp	Yes	52	LED - Fixtures: Other	Occupancy Sensor	15	3,142	3.05	24,020	0.0	$3,095.79	$3,041.04	$175.00	0.93
1St Fl Hallway	2	Incandescent: BULB	Wall Switch	100	4,488	Relamp	Yes	2	LED - Fixtures: Other	High/Low Control	15	3,142	0.12	924	0.0	$119.07	$265.04	$0.00	2.23
Library	6	Incandescent: 5 SOFT WHITE THIN BULB	Wall Switch	200	4,488	Relamp	Yes	6	LED - Fixtures: Other	Occupancy Sensor	30	3,142	0.70	5,543	0.0	$714.41	$465.12	$35.00	0.60
1St Fl Hallway	16	Halogen Incandescent: INDEPENDENT BULB	Wall Switch	100	4,488	Relamp	Yes	16	LED - Fixtures: Other	High/Low Control	15	3,142	0.94	7,391	0.0	$952.55	$720.32	$0.00	0.76
Ground Fl Hallway	26	Halogen Incandescent: INDEPENDENT BULB	Wall Switch	100	4,488	Relamp	Yes	26	LED - Fixtures: Other	High/Low Control	15	3,142	1.53	12,010	0.0	$1,547.89	$1,045.52	$0.00	0.68
Auditorium	36	Halogen Incandescent: CAN HALOGEN LIGHT	High/Low Control	250	3,142	Relamp	No	36	LED - Fixtures: Other	High/Low Control	38	3,142	5.01	27,638	0.0	$3,562.09	$1,170.72	$0.00	0.33
Room 261	1	Compact Fluorescent: 2 PIN 24W CFL - 4L	High/Low Control	96	3,142	Relamp	No	1	LED - Fixtures: Other	High/Low Control	67	3,142	0.02	104	0.0	$13.41	$48.77	$0.00	3.64

	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 95	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
Janitor Closet	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 18C	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
Cafeteria	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
Fitness Center	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
B97	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
Room 102	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
Library	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
Stage	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
2Nd Fl Hallway	14	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	14	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
1St Fl Hallway	19	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	19	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ground Fl Hallway	23	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	23	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 95	32	Compact Fluorescent: SPOTLIGHTS	High/Low Control	20	3,142	Relamp	No	32	LED - Fixtures: Other	High/Low Control	14	3,142	0.13	694	0.0	$89.40	$1,560.64	$0.00	17.46
1St Fl Hallway	2	Compact Fluorescent: SPIRAL BULB 28W - 2L	Wall Switch	56	4,488	Relamp	Yes	2	LED - Fixtures: Other	High/Low Control	39	3,142	0.04	295	0.0	$38.00	$297.54	$0.00	7.83
35 Men	1	Compact Fluorescent: SPIRAL BULB	Wall Switch	18	4,488	Relamp	No	1	LED - Fixtures: Other	Wall Switch	12	4,488	0.00	27	0.0	$3.49	$18.26	$0.00	5.23
Stage	7	Compact Fluorescent: FLOODS	High/Low Control	120	3,142	Relamp	No	7	LED - Fixtures: Other	High/Low Control	84	3,142	0.17	910	0.0	$117.34	$341.39	$0.00	2.91
Exterior	54	Compact Fluorescent: 4 PIN T/E ECO. 42W - 1L	Daylight Dimming	42	4,380	Relamp	No	54	LED - Fixtures: Other	Daylight Dimming	29	4,380	0.45	3,427	0.0	$441.70	$2,633.58	$0.00	5.96
Exterior	16	Compact Fluorescent: 4 PIN T/E ECO. 32W - 1L	Daylight Dimming	32	4,380	Relamp	No	16	LED - Fixtures: Other	Daylight Dimming	22	4,380	0.10	774	0.0	$99.71	$780.32	$0.00	7.83
1St Fl Hallway	4	Compact Fluorescent: 4 PIN CFL 42W - 2L	Wall Switch	84	4,488	Relamp	Yes	4	LED - Fixtures: Other	High/Low Control	59	3,142	0.11	884	0.0	$113.99	$395.08	$0.00	3.47
Ground Fl Hallway	4	Compact Fluorescent: 4 PIN CFL 42W - 2L	Wall Switch	84	4,488	Relamp	Yes	4	LED - Fixtures: Other	High/Low Control	59	3,142	0.11	884	0.0	$113.99	$395.08	$0.00	3.47
148.5	2	Compact Fluorescent: 4 PIN CFL 26W - 2L	Wall Switch	52	4,488	Relamp	Yes	2	LED - Fixtures: Other	Occupancy Sensor	36	3,142	0.03	274	0.0	$35.28	$213.54	$0.00	6.05
Room 96	2	Compact Fluorescent: 4 PIN CFL 26W - 2L	Wall Switch	52	4,488	Relamp	Yes	2	LED - Fixtures: Other	Occupancy Sensor	36	3,142	0.03	274	0.0	$35.28	$213.54	$0.00	6.05
Kitchen 64	6	Compact Fluorescent: 4 PIN CFL 26W - 2L	Wall Switch	52	4,488	Relamp	Yes	6	LED - Fixtures: Other	Occupancy Sensor	36	3,142	0.10	821	0.0	$105.84	$562.62	$35.00	4.98
Auditorium	14	Compact Fluorescent: 4 PIN CFL 26W - 2L	High/Low Control	52	3,142	Relamp	No	14	LED - Fixtures: Other	High/Low Control	36	3,142	0.14	789	0.0	$101.69	$682.78	$0.00	6.71
Cafeteria	61	Compact Fluorescent: 4 PIN CFL 26W - 2L	Wall Switch	52	4,488	Relamp	Yes	61	LED - Fixtures: Other	Occupancy Sensor	36	3,142	1.06	8,349	0.0	$1,076.09	$4,594.97	$210.00	4.07

	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
2Nd Fl Hallway	29	Compact Fluorescent: 4 PIN CFL 26W - 2L	Wall Switch	52	4,488	Relamp	Yes	29	LED - Fixtures: Other	High/Low Control	36	3,142	0.50	3,969	0.0	$511.58	$1,614.33	$0.00	3.16
1St Fl Hallway	125	Compact Fluorescent: 4 PIN CFL 26W - 2L	Wall Switch	52	4,488	Relamp	Yes	125	LED - Fixtures: Other	High/Low Control	36	3,142	2.17	17,109	0.0	$2,205.10	$6,296.25	$0.00	2.86
Ground Fl Hallway	135	Compact Fluorescent: 4 PIN CFL 26W - 2L	Wall Switch	52	4,488	Relamp	Yes	135	LED - Fixtures: Other	High/Low Control	36	3,142	2.35	18,478	0.0	$2,381.51	$6,783.95	$0.00	2.85
Stairs	90	Compact Fluorescent: 4 PIN CFL 24W - 1L	Wall Switch	24	4,488	Relamp	Yes	90	LED - Fixtures: Other	High/Low Control	17	3,142	0.72	5,686	0.0	$732.77	$4,589.30	$0.00	6.26
148.5	3	Compact Fluorescent: 2 PIN LONG CFL 24W- 2L	Wall Switch	48	4,488	Relamp	Yes	3	LED - Fixtures: Other	Occupancy Sensor	34	3,142	0.05	379	0.0	$48.85	$262.31	$0.00	5.37
2Nd Fl Hallway	1	Compact Fluorescent: 2 PIN 24W CFL - 4L	Wall Switch	96	4,488	Relamp	Yes	1	LED - Fixtures: Other	High/Low Control	67	3,142	0.03	253	0.0	$32.57	$248.77	$0.00	7.64
1St Fl Hallway	1	Compact Fluorescent: 2 PIN 24W CFL - 4L	Wall Switch	96	4,488	Relamp	Yes	1	LED - Fixtures: Other	High/Low Control	67	3,142	0.03	253	0.0	$32.57	$248.77	$0.00	7.64

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
Boiler Room	B-1	1	Combustion Air Fan	25.0	89.5%	No	2,034	Yes	91.7%	No		0.28	762	0.0	$98.27	$2,366.47	$0.00	24.08
Boiler Room	B-2	1	Combustion Air Fan	25.0	89.5%	No	2,034	Yes	91.7%	No		0.28	762	0.0	$98.27	$2,366.47	$0.00	24.08
Boiler Room	BF-1	6	Boiler Feed Water Pump	3.0	85.5%	No	2,745	Yes	89.5%	Yes	6	2.61	19,216	0.0	$2,476.57	$22,874.94	$0.00	9.24
Boiler Room	Boiler	2	Other	0.3	68.0%	No	2,745	No	68.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Water Heater	1	Combustion Air Fan	0.5	68.0%	No	2,745	No	68.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Chiller Room	Chiller	1	Chilled Water Pump	25.0	91.7%	Yes	4,067	No	91.7%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Chiller Room	DTWP-1	1	Chilled Water Pump	75.0	95.0%	Yes	1,332	No	95.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Chiller Room	DTWP-2	1	Chilled Water Pump	75.0	95.0%	Yes	1,332	No	95.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Chiller Room	CWP-1,2	2	Condenser Water Pump	40.0	93.0%	No	2,034	No	93.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Chiller Room	Air Compressor	2	Air Compressor	5.0	87.5%	No	2,479	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Storage Room	Condensate Pump	2	Process Pump	5.0	85.5%	No	2,745	No	85.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Cooling Tower	2	Cooling Tower Fan	40.0	93.0%	Yes	3,389	No	93.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	FOP-1D	1	Process Pump	0.3	68.0%	No	2,745	No	68.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-A1 A Sector Classrooms	2	Supply Fan	15.0	91.0%	No	1,696	Yes	92.4%	Yes	2	4.11	7,818	0.0	$1,007.66	$14,171.74	$2,400.00	11.68
Roof	AHU-A1 A Sector Classrooms	1	Return Fan	5.0	87.5%	No	2,745	Yes	89.5%	Yes	1	0.72	2,236	0.0	$288.14	$4,196.91	$400.00	13.18
Roof	AHU-A2 New Media Library	2	Supply Fan	15.0	91.0%	No	3,391	Yes	92.4%	Yes	2	4.11	15,637	0.0	$2,015.31	$14,171.74	$2,400.00	5.84
Roof	AHU-A2 New Media Library	1	Return Fan	5.0	87.5%	No	2,745	Yes	89.5%	Yes	1	0.72	2,236	0.0	$288.14	$4,196.91	$400.00	13.18
Roof	AHU-B1 Cafeteria	1	Supply Fan	7.5	88.5%	No	3,391	Yes	91.7%	Yes	1	1.10	4,229	0.0	$545.06	$4,760.59	$600.00	7.63
Roof	AHU-B1 Cafeteria	1	Return Fan	2.0	84.0%	No	2,745	Yes	86.5%	Yes	1	0.31	947	0.0	$122.10	$3,623.09	$160.00	28.36
Roof	AHU-C1 Ground MER	1	Supply Fan	7.5	88.5%	No	3,391	Yes	91.7%	Yes	1	1.10	4,229	0.0	$545.06	$4,760.59	$600.00	7.63

		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	AHU-C2 Ground MER	1	Supply Fan	7.5	88.5%	No	3,391	Yes	91.7%	Yes	1	1.10	4,229	0.0	$545.06	$4,760.59	$600.00	7.63
Roof	AHU-E1 Gym	1	Supply Fan	15.0	91.0%	No	3,391	Yes	92.4%	Yes	1	2.05	7,818	0.0	$1,007.66	$7,085.87	$1,200.00	5.84
Roof	AHU-E2 Gym	1	Supply Fan	15.0	91.0%	No	3,391	Yes	92.4%	Yes	1	2.05	7,818	0.0	$1,007.66	$7,085.87	$1,200.00	5.84
Roof	AHU-F1 Auditorium Seating Area	1	Supply Fan	20.0	91.0%	No	3,391	Yes	93.0%	Yes	1	2.78	10,599	0.0	$1,366.08	$8,850.23	$1,600.00	5.31
Roof	AHU-F1 Auditorium Seating Area	1	Return Fan	20.0	91.0%	No	3,391	Yes	93.0%	Yes	1	2.78	10,599	0.0	$1,366.08	$8,850.23	$1,600.00	5.31
Roof	AHU-F2 Auditorium Stage	2	Supply Fan	10.0	89.5%	No	3,391	Yes	91.7%	Yes	2	2.84	10,847	0.0	$1,397.94	$10,750.00	$1,600.00	6.55
Roof	AHU-F2 Auditorium Stage	1	Return Fan	7.5	88.5%	No	3,391	Yes	91.7%	Yes	1	1.10	4,229	0.0	$545.06	$4,760.59	$600.00	7.63
Roof	AHU-F3 Band Room	1	Supply Fan	7.5	88.5%	No	3,391	Yes	91.7%	Yes	1	1.10	4,229	0.0	$545.06	$4,760.59	$600.00	7.63
Roof	AHU-F3 Band Room	1	Return Fan	2.0	84.0%	No	2,745	Yes	86.5%	Yes	1	0.31	947	0.0	$122.10	$3,623.09	$160.00	28.36
Roof	AHU-F4 Corridor	1	Supply Fan	2.0	84.0%	No	2,745	Yes	86.5%	Yes	1	0.31	947	0.0	$122.10	$3,623.09	$160.00	28.36
Roof	AHU-F4 Corridor	1	Return Fan	1.0	82.5%	No	2,745	Yes	85.5%	Yes	1	0.16	490	0.0	$63.14	$3,282.80	$80.00	50.73
Roof	AHU-F5 Auditorium Lobby	2	Supply Fan	10.0	89.5%	No	3,391	Yes	91.7%	Yes	2	2.84	10,847	0.0	$1,397.94	$10,750.00	$1,600.00	6.55
Roof	AHU-F5 Auditorium Lobby	1	Return Fan	7.5	88.5%	No	3,391	Yes	91.7%	Yes	1	1.10	4,229	0.0	$545.06	$4,760.59	$600.00	7.63
Roof	AHU-F6 Room 191	1	Supply Fan	10.0	89.5%	No	3,391	Yes	91.7%	Yes	1	1.42	5,423	0.0	$698.97	$5,375.00	$800.00	6.55
Roof	AHU-F6 Room 191	1	Return Fan	5.0	87.5%	No	2,745	Yes	89.5%	Yes	1	0.72	2,236	0.0	$288.14	$4,196.91	$400.00	13.18
Roof	AHU-F7 Remote Admin Office	1	Supply Fan	3.0	86.5%	No	2,745	Yes	89.5%	Yes	1	0.45	1,396	0.0	$179.95	$3,812.49	$240.00	19.85
Roof	AHU-F7 Remote Admin Office	1	Return Fan	3.0	86.5%	No	2,745	Yes	89.5%	Yes	1	0.45	1,396	0.0	$179.95	$3,812.49	$240.00	19.85
Roof	AHU-F9 Practice room and hall	1	Supply Fan	2.0	84.0%	No	2,745	Yes	86.5%	Yes	1	0.31	947	0.0	$122.10	$3,623.09	$160.00	28.36
Roof	AHU-F9 Practice room and hall	1	Return Fan	1.0	82.5%	No	2,745	Yes	85.5%	Yes	1	0.16	490	0.0	$63.14	$3,282.80	$80.00	50.73
Roof	AHU-G1 2006 Gym	2	Supply Fan	15.0	91.0%	No	3,391	Yes	92.4%	Yes	2	4.11	15,637	0.0	$2,015.31	$14,171.74	$2,400.00	5.84

		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	AHU-G1 2006 Gym	1	Return Fan	10.0	89.5%	No	3,391	Yes	91.7%	Yes	1	1.42	5,423	0.0	$698.97	$5,375.00	$800.00	6.55

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
Staffroom	Staffroom	1	Split-System AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Elec. Closet 029	AC-F2 Elec closet	1	Packaged AC	2.00		Yes	1	Packaged AC	2.00		14.00		No	0.58	980	0.0	$126.29	$4,537.92	$184.00	34.48
Auditorium Control Room	AC-F3	1	Packaged Air-Source HP	1.00	12.00	Yes	1	Packaged Air-Source HP	1.00	12.00	14.00	3.80	No	0.29	457	0.0	$58.89	$2,268.96	$92.00	36.97
Special Ed. F-105	AC-E1	1	Packaged Air-Source HP	1.00	12.00	Yes	1	Packaged Air-Source HP	1.00	12.00	14.00	3.80	No	0.29	457	0.0	$58.89	$2,268.96	$92.00	36.97
Basement MER	AC-E2 Tv studio & control room	1	Packaged Air-Source HP	2.00	18.10	Yes	1	Packaged Air-Source HP	2.00	18.10	14.00	3.80	No	0.58	770	0.0	$99.28	$4,537.92	$184.00	43.85
Basement MER	AC-E3 Tv studio	1	Packaged Air-Source HP	5.00	38.90	Yes	1	Packaged Air-Source HP	5.00	38.90	14.00	3.80	No	1.45	1,771	0.0	$228.30	$11,344.80	$460.00	47.68
Data Room C142	AC-C1	1	Packaged Air-Source HP	1.50	17.10	Yes	1	Packaged Air-Source HP	1.50	17.10	14.00	3.80	No	0.44	663	0.0	$85.51	$3,403.44	$138.00	38.19
Video Room C-212	AC-C2&C3	2	Packaged Air-Source HP	5.00	38.90	Yes	2	Packaged Air-Source HP	5.00	38.90	14.00	3.80	No	2.90	3,543	0.0	$456.60	$22,689.60	$920.00	47.68
English Lab A-124	AC-A1&A2	2	Packaged AC	2.00		Yes	2	Packaged AC	2.00		14.00		No	1.16	1,960	0.0	$252.57	$9,075.84	$368.00	34.48
School Sotre D-118	AC-C4	1	Packaged AC	1.50		Yes	1	Packaged AC	1.50		14.00		No	0.44	735	0.0	$94.71	$3,403.44	$138.00	34.48
Custodian Support	AC-B1	1	Packaged AC	1.50		Yes	1	Packaged AC	1.50		14.00		No	0.44	735	0.0	$94.71	$3,403.44	$138.00	34.48
Storage D-050	AC-D1	1	Packaged AC	2.00		Yes	1	Packaged AC	2.00		14.00		No	0.58	980	0.0	$126.29	$4,537.92	$184.00	34.48
Roof	AHU-A1 A Sector Classrooms	1	Packaged AC	25.00		Yes	1	Packaged AC	25.00		10.50		Yes	4.25	12,070	0.0	$1,555.56	$43,284.98	$2,225.00	26.40
Roof	AHU-A2 New Media Library	1	Packaged AC	25.00		Yes	1	Packaged AC	25.00		10.50		Yes	4.25	12,070	0.0	$1,555.56	$43,284.98	$2,225.00	26.40
Roof	AHU-B1 Cafeteria	1	Packaged AC	20.00		Yes	1	Packaged AC	20.00		10.50		Yes	3.40	9,656	0.0	$1,244.45	$34,647.98	$1,830.00	26.37
Roof	AHU-F1 Auditorium Seating Area	1	Packaged AC	40.00		Yes	1	Packaged AC	40.00		10.50		Yes	6.80	19,311	0.0	$2,488.90	$91,138.87	$250.00	36.52
Roof	AHU-F2 Auditorium Stage	1	Packaged AC	25.00		Yes	1	Packaged AC	25.00		10.50		Yes	4.25	12,070	0.0	$1,555.56	$43,284.98	$2,225.00	26.40
Roof	AHU-F3 Band Room	1	Packaged AC	20.00		Yes	1	Packaged AC	20.00		10.50		Yes	3.40	9,656	0.0	$1,244.45	$34,647.98	$1,830.00	26.37
Roof	AHU-F4 Corridor	1	Packaged AC	3.00		Yes	1	Packaged AC	3.00		14.00		Yes	1.09	2,450	0.0	$315.81	$7,306.88	$526.00	21.47
Roof	AHU-F5 Auditorium Lobby	1	Packaged AC	30.00		Yes	1	Packaged AC	30.00		10.50		Yes	5.10	14,484	0.0	$1,866.67	$67,579.15	$250.00	36.07

		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	AHU-F6 Room 191	1	Packaged AC	25.00		Yes	1	Packaged AC	25.00		10.50		Yes	4.25	12,070	0.0	$1,555.56	$43,284.98	$2,225.00	26.40
Roof	AHU-F7 Remote Admin Office	1	Packaged AC	8.00		Yes	1	Packaged AC	8.00		11.50		Yes	1.84	4,542	0.0	$585.34	$15,006.85	$834.00	24.21
Roof	AHU-F9 Practice room and hall	1	Packaged AC	5.00		Yes	1	Packaged AC	5.00		14.00		Yes	1.82	4,084	0.0	$526.35	$11,844.80	$710.00	21.15

Electric Chiller Inventory & Recommendations

		Existing Conditions			Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Chiller Room	CH-1	1	Water-Cooled Centrifugal Chiller	250.00	No							0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Chiller Room	CH-2	1	Water-Cooled Centrifugal Chiller	250.00	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
Boiler Room	B-1	1	Natural Draft Steam Boiler	11,714.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	B-2	1	Natural Draft Steam Boiler	11,714.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-A1 A Sector Classrooms	1	Furnace	408.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-A2 New Media Library	1	Furnace	408.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-B1 Cafeteria	1	Furnace	213.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-F1 Auditorium Seating Area	1	Furnace	593.40	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-F2 Auditorium Stage	1	Furnace	302.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-F3 Band Room	1	Furnace	213.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-F4 Corridor	1	Furnace	26.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-F5 Auditorium Lobby	1	Furnace	378.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-F6 Room 191	1	Furnace	260.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-F7 Remote Admin Office	1	Furnace	98.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-F9 Practice room and hall	1	Furnace	52.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-G1 2006 Gym	1	Furnace	260.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-C1 Ground MER	1	Furnace	172.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-C2 Ground MER	1	Furnace	130.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-E1 Gym	1	Furnace	60.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	AHU-E2 Gym	1	Furnace	604.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

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	Kitchen & Restrooms	1	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	50	Faucet Aerator (Lavatory)	2.20	1.00	0.00	0	74.2	$561.10	$358.50	$0.00	0.64
Restrooms	2	Faucet Aerator (Lavatory)	2.50	1.00	0.00	0	3.7	$28.05	$14.34	$0.00	0.51

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	Low Temp Freezer (-35F to -5F)	Yes	No	No	0.08	655	0.0	$84.46	$303.30	$0.00	3.59
Kitchen	1	Cooler (35F to 55F)	Yes	No	No	0.08	655	0.0	$84.46	$303.30	$0.00	3.59

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
Kitchen	1	Freezer Chest	No	Yes	0.39	3,418	0.0	$440.56	$2,012.00	$0.00	4.57
Kitchen	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	3	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Freezer Chest	No	Yes	0.33	2,921	0.0	$376.43	$1,870.00	$0.00	4.97

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
Storage Room	1	Ice Making Head (≥450 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/Cafeteria	1	Gas Convection Oven (Full Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen/Cafeteria	3	Gas Combination Oven/Steam Cooker (<15 Pans)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen/Cafeteria	2	Electric Convection Oven (Half Size)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen/Cafeteria	1	Electric Griddle (4 Feet Width)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen/Cafeteria	3	Insulated Food Holding Cabinet (Full 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
KITCHEN/CAFETERIA	1	Single Tank Conveyor (High Temp)	Natural Gas	Electric	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?
Classrooms	302	Computers	120.0	No
Classrooms	74	Projectors	120.0	Yes
Classrooms	87	Small Printers	46.0	Yes
Lunchroom/Kitchen	46	Microwave	800.0	No
Staffrooms	16	Coffee Maker	1,100.0	No
Staffrooms	20	Mini Fridge	130.0	No
Classrooms	27	Table/Wall Fan	55.0	No
Copy Room	12	Large Printer	600.0	Yes
Pantry	13	Big Fridge	255.0	No
Musicrooms	18	Tv	220.0	No
Classrooms	1	Ceiling Fan	100.0	No
Copy Room	1	Paper Shredder	46.0	No
Laundry	6	Washer And Dryer	1,200.0	No
Staffrooms	9	Table Lamp	60.0	No
Staffrooms	2	Table Lamp CFL	23.0	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
CAFETERIA	5	Refrigerated	Yes	0.00	8,059	0.0	$1,038.69	$1,150.00	$0.00	1.11
CAFETERIA	5	Non-Refrigerated	Yes	0.00	1,713	0.0	$220.72	$1,150.00	$0.00	5.21
CAFETERIA	3	Glass Fronted Refrigerated	Yes	0.00	3,627	0.0	$467.41	$690.00	$0.00	1.48

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Princeton High School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 293,020
Built: 1927

For Year Ending: July 31, 2017
Date Generated: October 02, 2018

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Princeton High School 151 Moore Street Princeton, New Jersey 08540	_____ . (___)___-_____	____ _____ . (___)___-_____ _____

Property ID: 6564225

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
90.7 kBtu/ft²

Source EUI
162 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	15,383,372 (58%)
Electric - Grid (kBtu)	11,185,895 (42%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	74.7
National Median Source EUI (kBtu/ft²)	133.5
% Diff from National Median Source EUI	21%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	1,950

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)