Local Government Energy Audit:
Energy Audit Report

Monmouth Regional High School

1 Norman J Field Way

Tinton Falls, NJ 07724

March 2, 2018

Final Report by:

TRC Energy Services

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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 saving 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 Monmouth Regional 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 local government in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

Monmouth Regional High School is a 192,441 square foot facility comprised of various space types. The School building has two (2) floors and includes classrooms, gyms, offices, kitchen, cafeteria, locker rooms, dining room and mechanical space.

Lighting is by and large efficient with opportunity for more energy savings. Hallways and some classrooms have been updated with LED lights, but the majority remains T8 fixtures. Heating is supplied by two (2) hot water boilers of 12500 MBH output capacity. Forty percent of the building is cooled (using split systems and packaged units mostly). A thorough description of the facility and our observations are located in Section 2.

1.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 13 measures which together represent an opportunity for Monmouth Regional High School to reduce annual energy costs by $67,830 and annual greenhouse gas emissions by 548,962 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 10.9 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 Monmouth Regional High School's annual energy use by 18%.

Figure 1 – Previous 12 Month Utility Costs

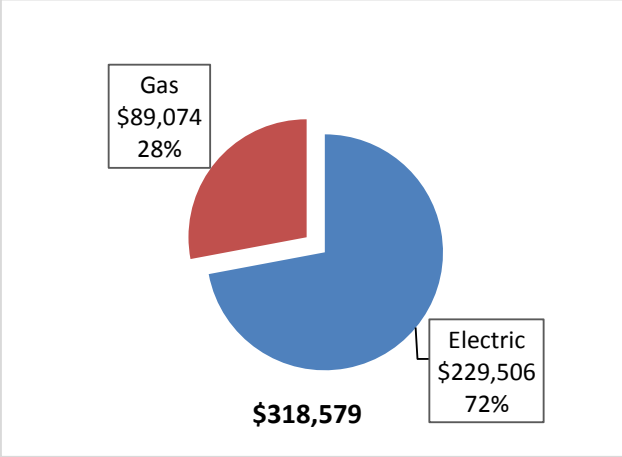
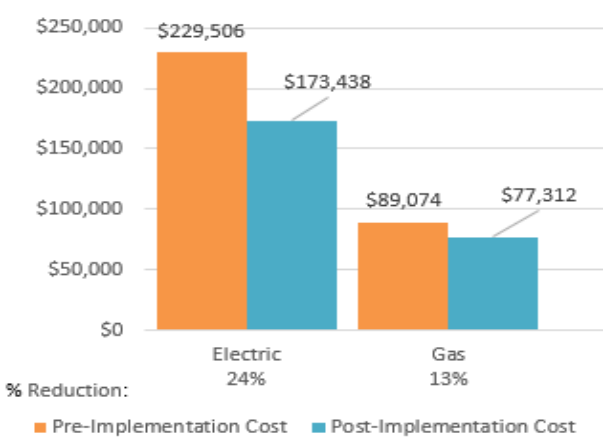


Figure 2 – Potential Post-Implementation Costs



A detailed description of Monmouth Regional 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 Natural Gas Savings (MMBtu)	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			**296,688**	**55.1**	**0.0**	**0.0**	**$39,903.43**	**$152,988.36**	**$25,075.00**	**$127,913.36**	**3.2**	**298,763**
ECM 1	Install LED Fixtures	Yes	36,092	4.7	0.0	0.0	$4,854.19	$20,705.88	$5,300.00	$15,405.88	3.2	36,344
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	267	0.1	0.0	0.0	$35.97	$459.69	$0.00	$459.69	12.8	269
ECM 3	Retrofit Fixtures with LED Lamps	Yes	258,445	50.1	0.0	0.0	$34,759.88	$127,628.15	$19,775.00	$107,853.15	3.1	260,252
ECM 4	Install LED Exit Signs	Yes	1,884	0.1	0.0	0.0	$253.38	$4,194.65	$0.00	$4,194.65	16.6	1,897
Lighting Control Measures			**40,439**	**8.1**	**0.0**	**0.0**	**$5,438.88**	**$14,072.00**	**$2,680.00**	**$11,392.00**	**2.1**	**40,722**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	40,439	8.1	0.0	0.0	$5,438.88	$14,072.00	$2,680.00	$11,392.00	2.1	40,722
Motor Upgrades			**87**	**0.0**	**0.0**	**0.0**	**$11.74**	**$4,153.35**	**$0.00**	**$4,153.35**	**353.9**	**88**
ECM 6	Premium Efficiency Motors	Yes	87	0.0	0.0	0.0	$11.74	$4,153.35	$0.00	$4,153.35	353.9	88
Variable Frequency Drive (VFD) Measures			**52,538**	**5.8**	**0.0**	**0.0**	**$7,066.09**	**$22,955.90**	**$5,150.00**	**$17,805.90**	**2.5**	**52,905**
ECM 7	Install VFDs on Boiler Feedwater Pumps	Yes	52,538	5.8	0.0	0.0	$7,066.09	$22,955.90	$5,150.00	$17,805.90	2.5	52,905
Electric Unitary HVAC Measures			**15,811**	**9.4**	**0.0**	**0.0**	**$2,126.56**	**$106,295.08**	**$5,702.60**	**$100,592.48**	**47.3**	**15,922**
ECM 8	Install High Efficiency Electric AC	Yes	15,811	9.4	0.0	0.0	$2,126.56	$106,295.08	$5,702.60	$100,592.48	47.3	15,922
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**943.7**	**943.7**	**$10,061.32**	**$458,326.43**	**$0.00**	**$458,326.43**	**45.6**	**110,494**
ECM 9	Install High Efficiency Hot Water Boilers	Yes	0	0.0	943.7	943.7	$10,061.32	$458,326.43	$0.00	$458,326.43	45.6	110,494
HVAC System Improvements			**5,105**	**1.2**	**0.0**	**0.0**	**$686.55**	**$1,650.00**	**$500.00**	**$1,150.00**	**1.7**	**5,140**
ECM 10	Install Dual Enthalpy Outside Economizer Control	Yes	5,105	1.2	0.0	0.0	$686.55	$1,650.00	$500.00	$1,150.00	1.7	5,140
Domestic Water Heating Upgrade			**0**	**0.0**	**159.5**	**159.5**	**$1,700.91**	**$16,379.20**	**$563.50**	**$15,815.70**	**9.3**	**18,679**
ECM 11	Install High Efficiency Gas Water Heater	Yes	0	0.0	111.2	111.2	$1,185.46	$16,135.42	$563.50	$15,571.92	13.1	13,019
ECM 12	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	48.3	48.3	$515.45	$243.78	$0.00	$243.78	0.5	5,661
Plug Load Equipment Control - Vending Machine			**6,206**	**0.0**	**0.0**	**0.0**	**$834.63**	**$1,610.00**	**$0.00**	**$1,610.00**	**1.9**	**6,249**
ECM 13	Vending Machine Control	Yes	6,206	0.0	0.0	0.0	$834.63	$1,610.00	$0.00	$1,610.00	1.9	6,249
TOTALS			**416,874**	**79.5**	**1,103.2**	**1,103.2**	**$67,830.10**	**$778,430.32**	**$39,671.10**	**$738,759.22**	**10.9**	**548,962**

* - 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 measure 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.

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

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

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

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 outlets when not in use.

Energy Efficient Practices

TRC also identified eight (8) 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 Monmouth Regional High School include:

- Use Window Treatments/Coverings

- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean and/or Replace HVAC Filters
- 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 Monmouth Regional High School. Based on the configuration of the site and its loads there is a Moderate potential for installing a photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	Medium	
System Potential	80	kW DC STC
Electric Generation	95,310	kWh/yr
Displaced Cost	$8,290	/yr
Installed Cost	$208,000	

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)

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 8.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

Additional information on relevant incentive programs is located in Section 8 or: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Maria Anne Parry	Business Administrator	ssrinivasan@trcsolutions.com	(732) 855-2897
Frank Reineke	Supervisor of Buildings and Grounds	frank.reineke@monmouthregional.net	(732) 859-4057
TRC Energy Services			
Smruti Srinivasan	Auditor	ssrinivasan@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On January 25, 2017, TRC performed an energy audit at Monmouth Regional High School located in Tinton Falls, New Jersey. TRC's auditor met with Frank Reineke, Supervisor of Buildings and Grounds to review the facility operations and focus on investigation of specific energy-using systems.

Monmouth Regional High School is a 192,441 square foot facility comprised of various space types. The building has two (2) floors and includes classrooms, gyms, offices, kitchen, cafeteria, locker rooms dining room and mechanical space. The building was constructed in 1960.

2.3 Building Occupancy

The school building is open from 6:00 AM to 11:00 PM, Monday through Friday most of the year. During the weekends and summer the school is open for sports activities. During a typical day, the facility is occupied by approximately 135 staff and 1000 students.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Monmouth Regional High Scool District	Weekday	6AM - 11PM During Summer time: 6PM - 3PM
Monmouth Regional High Scool District	Weekend	7AM - 11PM (for 26 weeks)

2.4 Building Envelope

The buildings are constructed of concrete block, and structural steel with a brick facade. The flat roof is covered with black membrane (EPDM). The dividing walls in the building are concrete blocks. The buildings have double pane windows which are in good condition. The exterior doors are constructed of aluminum frames and are in good condition.

Image 1 Building exterior, doors and windows

2.5 On-Site Generation

Monmouth Regional 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. In 2015, the hallways, gym and theater received an LED retrofit. A small area of the building and the majority of the office spaces are primarily lit with 26-Watt or 42-Watt CFL lamps in recessed can ceiling fixtures.

Lighting control in most spaces is provided by wall switches. The library, a few classrooms and fitness centers are controlled by occupancy sensors. The occupancy sensors are either wall or ceiling mounted depending on the space layout. Stairwells, elevator lobbies and main lobby areas do not contain any occupancy sensors and are on 24 hours per day throughout the year.

Exterior lighting is primarily efficient high pressure sodium (HPS) and metal halide fixtures that are controlled by timers. Some wall pack fixtures have been changed to LED fixtures.

Image 2 Typical lighting fixtures

Hot Water (or Steam) Heating System

The hot water system consists of two (2) Bryan 12,500 MBH output boilers (BR1 & 2) with a nominal combustion efficiency of 79.3%. The boilers have dedicated (2) 15hp, (2) 10hp, (2) 5hp and (2) 3 hp pumps that circulate hot water throughout the building (to various areas) for heating purposes. The boilers also provide hot water to air handlers (AHU1 to AHU5). The boilers are original to the building and over 50 years old.

The boilers operate in a lead/lag configuration and operate equally. Both boilers may be required during cold weather. The boilers are controlled using the building management system (BMS), manually depending on the outside temperature. During the nights and the unoccupied hours, the boiler temperature is set to 65°F.

Image 3 Hot water boiler

Direct Expansion Air Conditioning System (DX)

The school has 45 split AC systems (ranging from 1.5 to 3 tons) serving various office spaces, 25 packaged units serve larger spaces like the classrooms, music rooms, and the fitness center. The units range from one (1) year old to 28 years old. The older units are no longer deemed efficient and have been

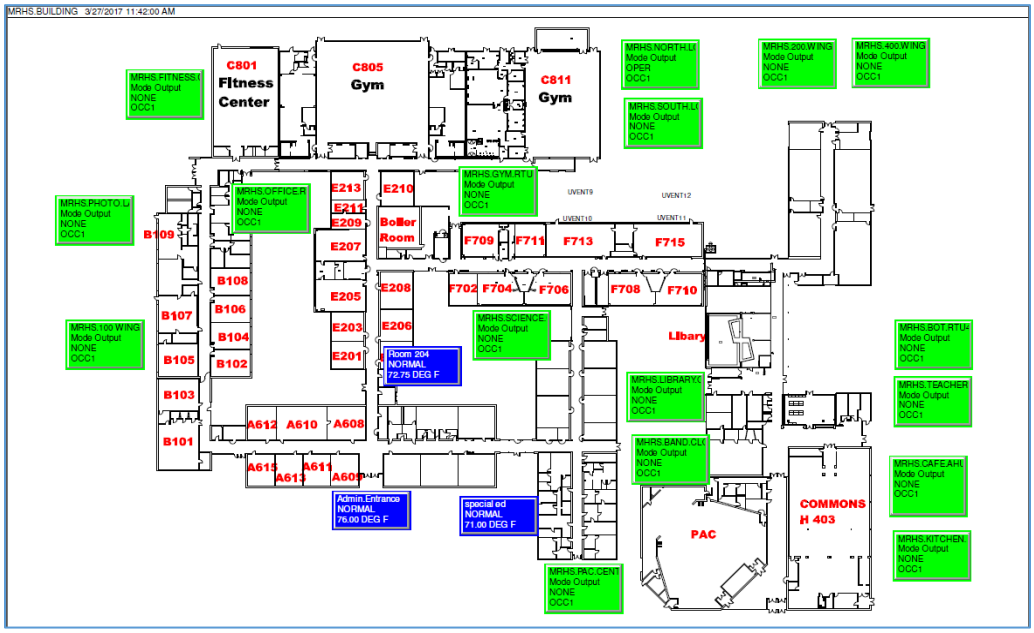
recommended for replacement. The school also does not make use of free cooling during the spring and the fall seasons.

The majority of the split AC systems are for individual zones, which are controlled using individual thermostats located in the respective areas.

Image 4 Split AC system; Programmable thermostat

Building Management System (BEMS)

The facility is controlled with a central system building management system (BMS) provided by Siemens. Temperatures of different zones, night set-back temperatures, boiler pump operations etc., are monitored and controlled by the maintenance department using this system.



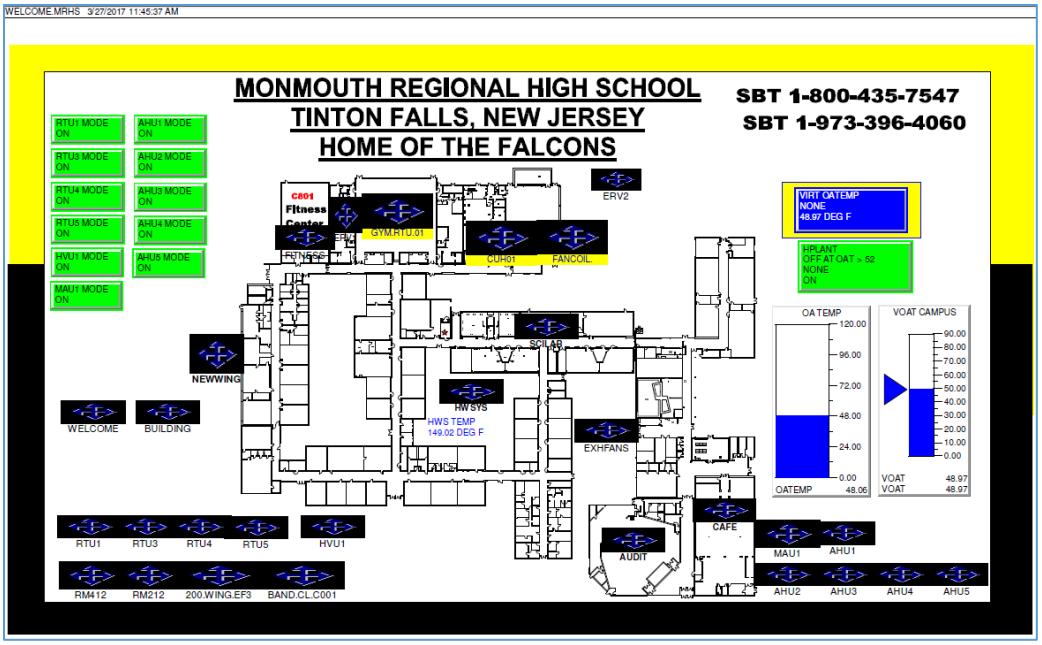


Image 5 Screen shots of the BMS system

Domestic Hot Water Heating System

The domestic hot water heating system consists of one (1) AO Smith gas fired hot water heater with an input rating of 322 kBtu/hr each and a nominal efficiency of 80%. The heater has a 98 gallon storage tank.

Image 6 Domestic hot water heater

Food Service & Laundry Equipment

The school has a fully equipped commercial kitchen with a combination of electric and gas equipment. The kitchen is used to prepare approximately 1,000 lunches per day for the students and staff. Most of the cooking is done using the convection ovens and the single large griddle.

Image 7 Kitchen equipment samples

Refrigeration

The kitchen has a walk-in refrigerator and a walk in freezer that is used to store food prepared for school lunches. The kitchen also has a free standing commercial refrigerators, freezers and freezer chest.

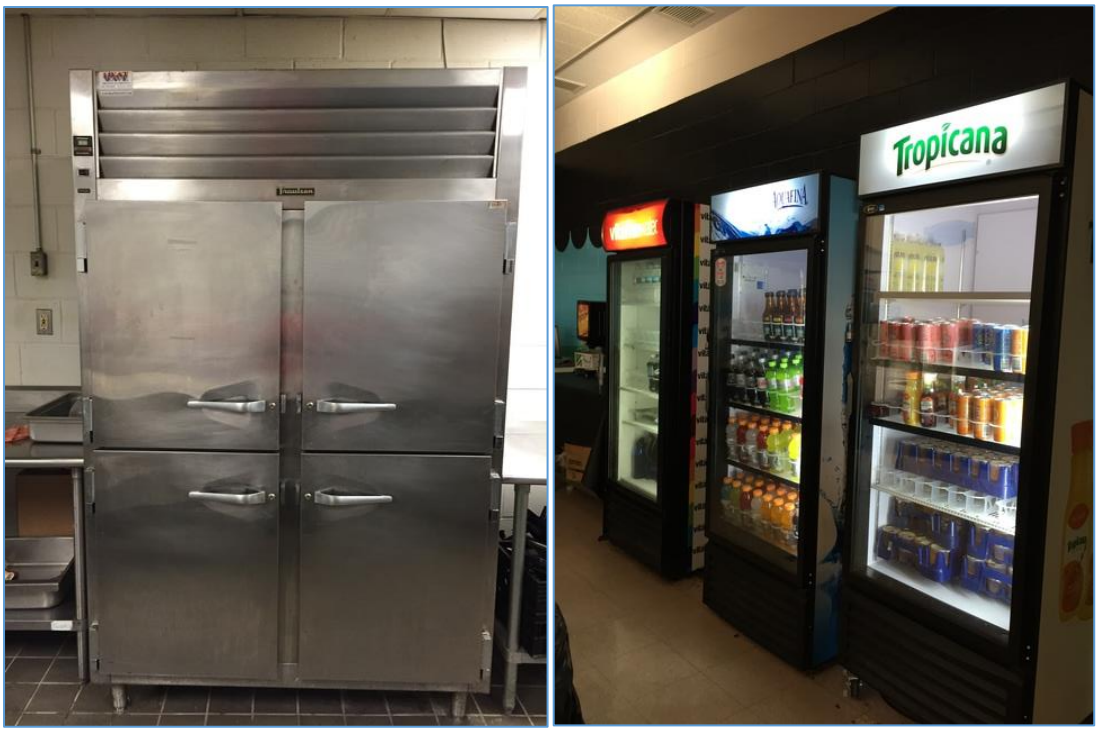


Image 8 Standalone refrigerators

Building Plug Load

There are 303 computer work stations throughout the facility; 90% of the computers are desktop units with LCD monitors. There is no centralized PC power management software installed.

There are five (5) server closest scattered throughout the facility. Half of them have cooling provided by dedicated split systems.

Other plug loads include printers, CRT television (a lot of which were left turned on even after school hours), refrigerators, microwaves, smart boards, coffee machine etc. The facility has three (3) refrigerated beverage vending machines and four (4) non-refrigerated vending machines that were observed on site. There were no controls installed.

2.7 Water-Using Systems

A sampling of restrooms found that the faucets are rated for 2.5 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).

Image 9 Low flow fixtures

The school has a girls and boys locker room. Both of the locker rooms have six (6) automatic showerheads that are rated for 1.5 gpm.

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

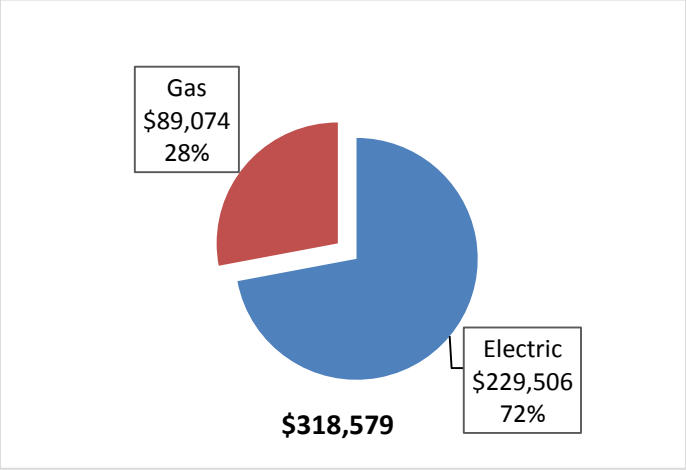
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Monmouth Regional High School District		
Fuel	**Usage**	**Cost**
Electricity	1,706,410 kWh	$229,506
Natural Gas	83,546 Therms	$89,074
Total		**$318,579**

The current annual energy cost for this facility is $318,579 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric cost over the past 12 months was $0.134/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.

Figure 9 - Electric Usage & Demand

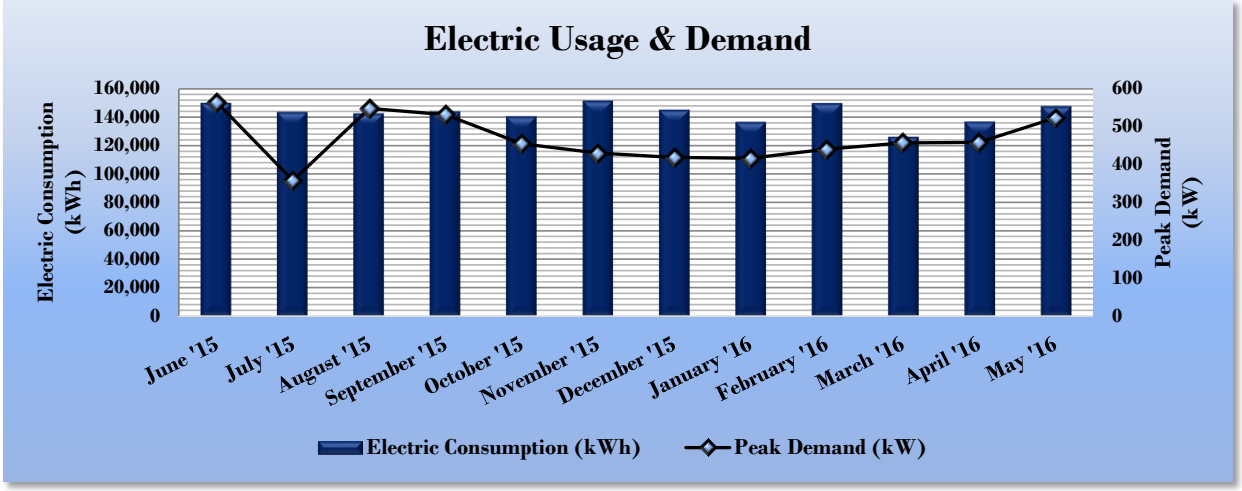


Figure 10 - Electric Usage & Demand

Electric Billing Data for Monmouth Regional High School District					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
7/9/15	30	149,243	565	$3,272	$21,115
8/10/15	32	142,949	358	$2,029	$19,118
9/10/15	31	141,913	548	$3,810	$20,030
10/9/15	29	143,321	531	$2,868	$19,232
11/9/15	31	139,788	455	$2,451	$18,432
12/10/15	31	150,866	430	$2,330	$19,566
1/12/16	33	144,535	419	$2,238	$18,792
2/10/16	29	135,901	416	$2,224	$17,779
3/10/16	29	149,089	441	$2,360	$19,507
4/8/16	29	125,570	457	$2,450	$17,084
5/9/16	31	136,238	459	$2,462	$18,325
6/8/16	30	146,997	523	$3,024	$20,526
Totals	**365**	**1,706,410**	**564.5**	**$31,520**	**$229,506**
Annual	**365**	**1,706,410**	**564.5**	**$31,520**	**$229,506**

3.3 Natural Gas Usage

Natural Gas is provided by New Jersey Natural Gas. The average gas cost for the past 12 months is $1.066/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 11 - Natural Gas Usage

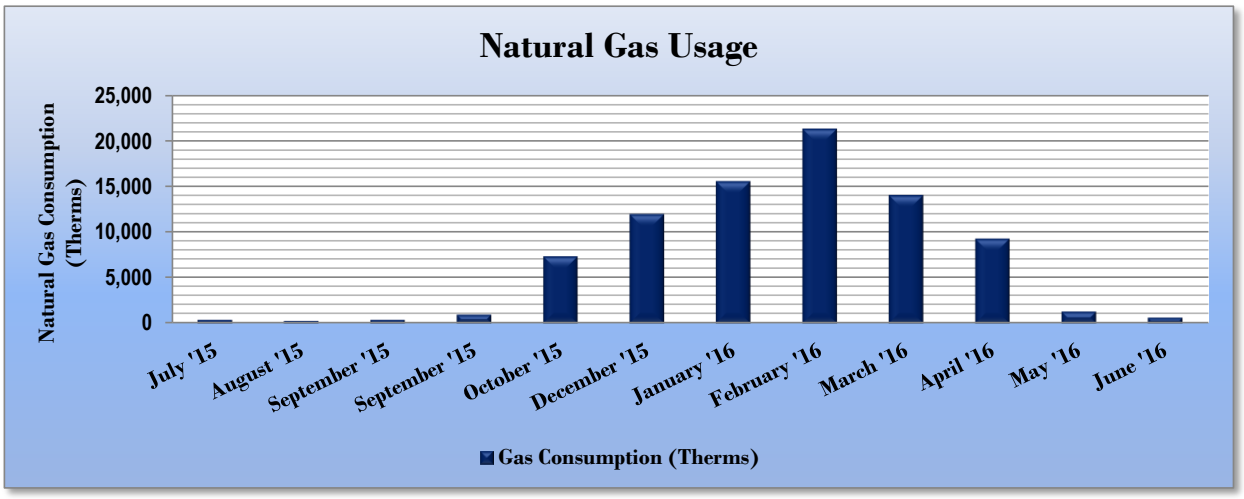


Figure 12 - Natural Gas Usage

Gas Billing Data for Monmouth Regional High School District			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
7/22/15	32	375	$2,496
8/19/15	28	268	$2,045
9/16/15	28	365	$2,123
10/15/15	29	954	$2,585
11/13/15	29	7,313	$7,598
12/16/15	33	11,920	$11,346
1/18/16	33	15,512	$14,215
2/18/16	31	21,249	$18,796
3/21/16	32	13,996	$13,004
4/19/16	29	9,237	$9,205
5/17/16	28	1,290	$2,859
6/17/16	31	609	$2,315
Totals	**363**	**83,088**	**$88,586**
Annual	**365**	**83,546**	**$89,074**

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		
	Monmouth Regional High School District	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	140.6	141.4
Site Energy Use Intensity (kBtu/ft^2)	73.7	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		
	Monmouth Regional High School District	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	111.4	141.4
Site Energy Use Intensity (kBtu/ft^2)	60.5	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 65.

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

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

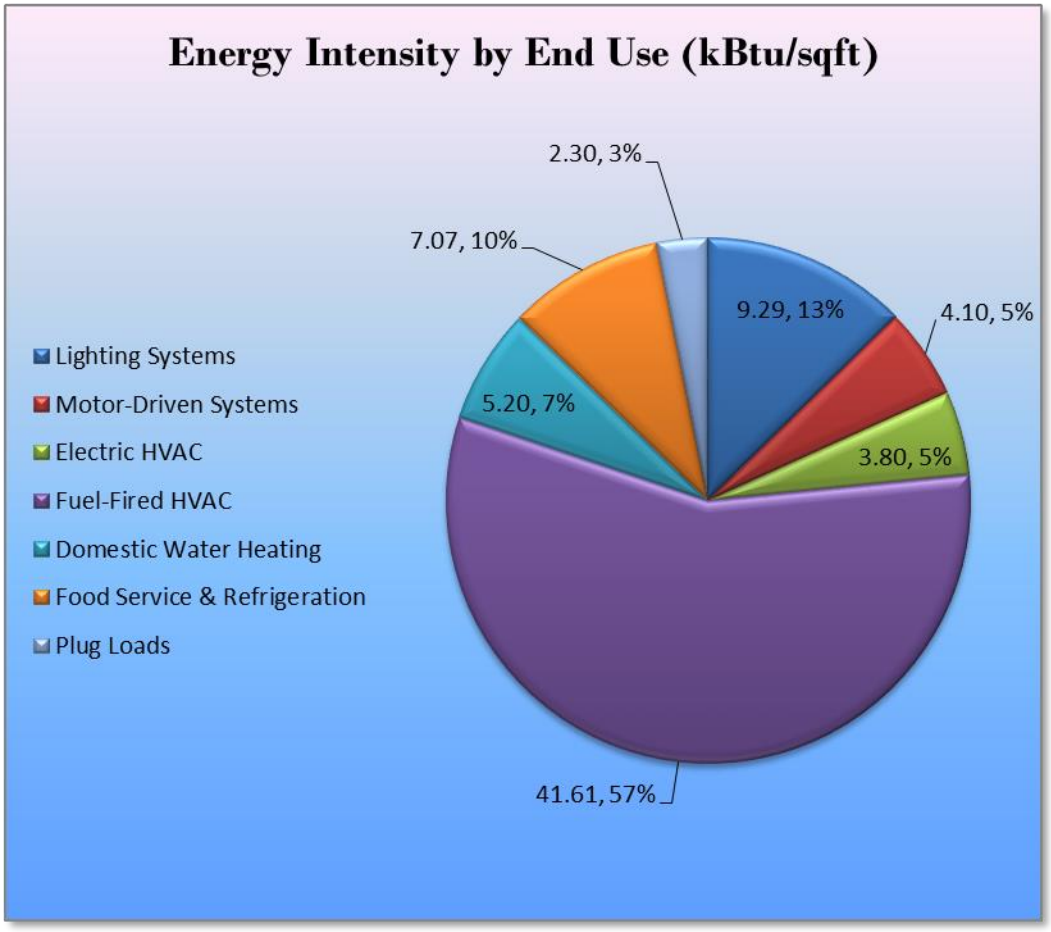
A Portfolio Manager account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio

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

3.5 Energy End-Use Breakdown

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

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



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Monmouth Regional 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.

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		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	*Annual Natural Gas Savings (MMBtu)*	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			**296,688**	**55.1**	**0.0**	**0.0**	**$39,903.43**	**$152,988.36**	**$25,075.00**	**$127,913.36**	**3.2**	**298,763**
ECM 1	Install LED Fixtures	Yes	36,092	4.7	0.0	0.0	$4,854.19	$20,705.88	$5,300.00	$15,405.88	3.2	36,344
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	267	0.1	0.0	0.0	$35.97	$459.69	$0.00	$459.69	12.8	269
ECM 3	Retrofit Fixtures with LED Lamps	Yes	258,445	50.1	0.0	0.0	$34,759.88	$127,628.15	$19,775.00	$107,853.15	3.1	260,252
ECM 4	Install LED Exit Signs	Yes	1,884	0.1	0.0	0.0	$253.38	$4,194.65	$0.00	$4,194.65	16.6	1,897
Lighting Control Measures			**40,439**	**8.1**	**0.0**	**0.0**	**$5,438.88**	**$14,072.00**	**$2,680.00**	**$11,392.00**	**2.1**	**40,722**
ECM 5	Install Occupancy Sensor Lighting Controls	Yes	40,439	8.1	0.0	0.0	$5,438.88	$14,072.00	$2,680.00	$11,392.00	2.1	40,722
Motor Upgrades			**87**	**0.0**	**0.0**	**0.0**	**$11.74**	**$4,153.35**	**$0.00**	**$4,153.35**	**353.9**	**88**
ECM 6	Premium Efficiency Motors	Yes	87	0.0	0.0	0.0	$11.74	$4,153.35	$0.00	$4,153.35	353.9	88
Variable Frequency Drive (VFD) Measures			**52,538**	**5.8**	**0.0**	**0.0**	**$7,066.09**	**$22,955.90**	**$5,150.00**	**$17,805.90**	**2.5**	**52,905**
ECM 7	Install VFDs on Boiler Feedwater Pumps	Yes	52,538	5.8	0.0	0.0	$7,066.09	$22,955.90	$5,150.00	$17,805.90	2.5	52,905
Electric Unitary HVAC Measures			**15,811**	**9.4**	**0.0**	**0.0**	**$2,126.56**	**$106,295.08**	**$5,702.60**	**$100,592.48**	**47.3**	**15,922**
ECM 8	Install High Efficiency Electric AC	Yes	15,811	9.4	0.0	0.0	$2,126.56	$106,295.08	$5,702.60	$100,592.48	47.3	15,922
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**943.7**	**943.7**	**$10,061.32**	**$458,326.43**	**$0.00**	**$458,326.43**	**45.6**	**110,494**
ECM 9	Install High Efficiency Hot Water Boilers	Yes	0	0.0	943.7	943.7	$10,061.32	$458,326.43	$0.00	$458,326.43	45.6	110,494
HVAC System Improvements			**5,105**	**1.2**	**0.0**	**0.0**	**$686.55**	**$1,650.00**	**$500.00**	**$1,150.00**	**1.7**	**5,140**
ECM 10	Install Dual Enthalpy Outside Economizer Control	Yes	5,105	1.2	0.0	0.0	$686.55	$1,650.00	$500.00	$1,150.00	1.7	5,140
Domestic Water Heating Upgrade			**0**	**0.0**	**159.5**	**159.5**	**$1,700.91**	**$16,379.20**	**$563.50**	**$15,815.70**	**9.3**	**18,679**
ECM 11	Install High Efficiency Gas Water Heater	Yes	0	0.0	111.2	111.2	$1,185.46	$16,135.42	$563.50	$15,571.92	13.1	13,019
ECM 12	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	48.3	48.3	$515.45	$243.78	$0.00	$243.78	0.5	5,661
Plug Load Equipment Control - Vending Machine			**6,206**	**0.0**	**0.0**	**0.0**	**$834.63**	**$1,610.00**	**$0.00**	**$1,610.00**	**1.9**	**6,249**
ECM 13	Vending Machine Control	Yes	6,206	0.0	0.0	0.0	$834.63	$1,610.00	$0.00	$1,610.00	1.9	6,249
TOTALS			**416,874**	**79.5**	**1,103.2**	**1,103.2**	**$67,830.10**	**$778,430.32**	**$39,671.10**	**$738,759.22**	**10.9**	**548,962**

* - 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

Recommended 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		**296,688**	**55.1**	**0.0**	**$39,903.43**	**$152,988.36**	**$25,075.00**	**$127,913.36**	**3.2**	**298,763**
ECM 1	Install LED Fixtures	36,092	4.7	0.0	$4,854.19	$20,705.88	$5,300.00	$15,405.88	3.2	36,344
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	267	0.1	0.0	$35.97	$459.69	$0.00	$459.69	12.8	269
ECM 3	Retrofit Fixtures with LED Lamps	258,445	50.1	0.0	$34,759.88	$127,628.15	$19,775.00	$107,853.15	3.1	260,252
ECM 4	Install LED Exit Signs	1,884	0.1	0.0	$253.38	$4,194.65	$0.00	$4,194.65	16.6	1,897

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	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0
Exterior	36,092	4.7	0.0	$4,854.19	$20,705.88	$5,300.00	$15,405.88	3.2	36,344

Measure Description

We recommend replacing existing fixtures containing fluorescent and HID lamps 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 a fluorescent tubes and more than ten (10) times longer than many incandescent lamps.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	267	0.1	0.0	$35.97	$459.69	$0.00	$459.69	12.8	269
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

ECM 3: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	218,798	45.0	0.0	$29,427.53	$123,871.54	$19,585.00	$104,286.54	3.5	220,328
Exterior	39,647	5.2	0.0	$5,332.35	$3,756.60	$190.00	$3,566.60	0.7	39,924

Measure Description

We recommend retrofitting existing halogen, HID or other lighting technologies 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.

ECM 4: Install LED EXIT Signs

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	1,884	0.1	0.0	$253.38	$4,194.65	$0.00	$4,194.65	16.6	1,897
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

4.1.2 Lighting Control Measures

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		**40,439**	**8.1**	**0.0**	**$5,438.88**	**$14,072.00**	**$2,680.00**	**$11,392.00**	**2.1**	**40,722**
ECM 5	Install Occupancy Sensor Lighting Controls	40,439	8.1	0.0	$5,438.88	$14,072.00	$2,680.00	$11,392.00	2.1	40,722

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

ECM 5: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
40,439	8.1	0.0	$5,438.88	$14,072.00	$2,680.00	$11,392.00	2.1	40,722

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all restrooms, storage rooms and classrooms, offices spaces. 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.

4.1.3 Motor Upgrades

ECM 6: 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)
87	0.0	0.0	$11.74	$4,153.35	$0.00	$4,153.35	353.9	88

Measure Description

We recommend replacing standard efficiency 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.

4.1.4 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		**52,538**	**5.8**	**0.0**	**$7,066.09**	**$22,955.90**	**$5,150.00**	**$17,805.90**	**2.5**	**52,905**
ECM 7	Install VFDs on Boiler Feedwater Pumps	52,538	5.8	0.0	$7,066.09	$22,955.90	$5,150.00	$17,805.90	2.5	52,905

ECM 7: 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)
52,538	5.8	0.0	$7,066.09	$22,955.90	$5,150.00	$17,805.90	2.5	52,905

Measure Description

We recommend installing variable frequency drives (VFD) to control 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 pump 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.

4.1.5 Electric Unitary HVAC Measures

Our recommendations for unitary HVAC measures are summarized in Figure 20 below.

Figure 20 - Summary of Unitary HVAC 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)
Electric Unitary HVAC Measures		**15,811**	**9.4**	**0.0**	**$2,126.56**	**$106,295.08**	**$5,702.60**	**$100,592.48**	**47.3**	**15,922**
ECM 8	Install High Efficiency Electric AC	15,811	9.4	0.0	$2,126.56	$106,295.08	$5,702.60	$100,592.48	47.3	15,922

ECM 8: 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)
15,811	9.4	0.0	$2,126.56	$106,295.08	$5,702.60	$100,592.48	47.3	15,922

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.

4.1.6 Gas-Fired Heating System Replacements

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	*Annual Natural Gas Savings (MMBtu)*	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)
ECM 9	Install High Efficiency Hot Water Boilers	Yes	0	0.0	943.7	943.7	$10,061.32	$458,326.43	$0.00	$458,326.43	45.6	110,494

ECM 9: Install High Efficiency Hot Water Boilers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	943.7	$10,061.32	$458,326.43	$0.00	$458,326.43	45.6	110,494

Measure Description

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

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

Therefore, condensing hydronic boilers were only evaluated when the return water temperature is less than 130°F during most of the operating hours. As a result condensing hydronic boilers are recommended for this site.

4.1.7 HVAC System Upgrades

Our recommendation for HVAC system improvement are summarized in Figure 21 below.

Figure 21 - Summary of HVAC System Improvement ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**5,105**	**1.2**	**0.0**	**$686.55**	**$1,650.00**	**$500.00**	**$1,150.00**	**1.7**	**5,140**
ECM 10	Install Dual Enthalpy Outside Economizer Control	5,105	1.2	0.0	$686.55	$1,650.00	$500.00	$1,150.00	1.7	5,140

ECM 10: 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)
5,105	1.2	0.0	$686.55	$1,650.00	$500.00	$1,150.00	1.7	5,140

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.

4.1.8 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 22 below.

Figure 22 - 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**	**159.5**	**$1,700.91**	**$16,379.20**	**$563.50**	**$15,815.70**	**9.3**	**18,679**
ECM 11	Install High Efficiency Gas Water Heater	0	0.0	111.2	$1,185.46	$16,135.42	$563.50	$15,571.92	13.1	13,019
ECM 12	Install Low-Flow Domestic Hot Water Devices	0	0.0	48.3	$515.45	$243.78	$0.00	$243.78	0.5	5,661

ECM 11: Install High Efficiency Gas-Fired Water Heater

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	111.2	$1,185.46	$16,135.42	$563.50	$15,571.92	13.1	13,019

Measure Description

We recommend replacing the existing tank water heater with a high efficiency tank water heater. Improvements in combustion efficiency and reductions in heat losses have improved the overall efficiency of storage water heaters. Energy savings results from using less gas to heat water, due to higher unit efficiency, and fewer run hours to maintain the tank water temperature.

ECM 12: 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	48.3	$515.45	$243.78	$0.00	$243.78	0.5	5,661

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 and low-flow showerheads can reduce hot water usage, relative to standard showerheads and aerators, which saves energy.

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

4.1.9 Plug Load Equipment Control - Vending Machines

ECM 13: 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)
6,206	0.0	0.0	$834.63	$1,610.00	$0.00	$1,610.00	1.9	6,249

Measure Description

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

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.

Use Window Treatments/Coverings

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

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.

Practice Proper Use of Thermostat Schedules and Temperature Resets

Ensure thermostats are correctly set back. By employing proper set back temperatures and schedules, facility heating and cooling costs can be reduced dramatically during periods of low or no occupancy. As such, thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced further by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

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.

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 4.1.8 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.

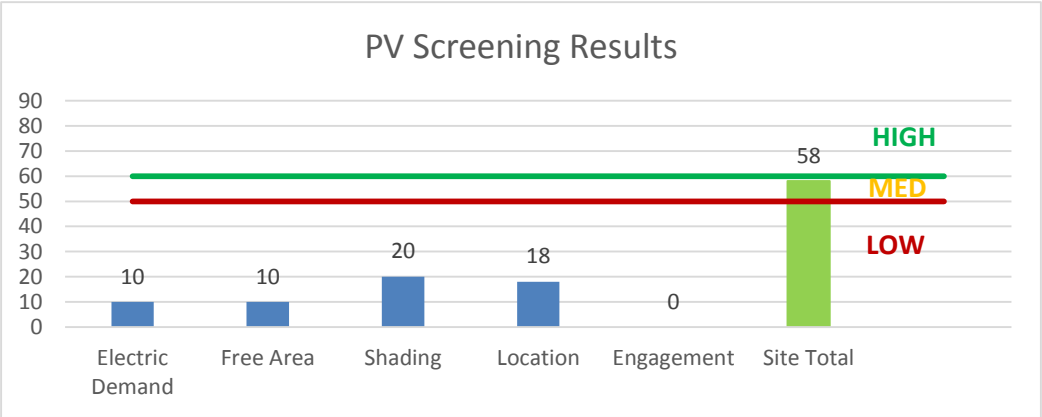
6.1 Photovoltaic

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 Medium potential for installing a PV array.

In order to be cost-effective, a solar PV array needs certain minimum criteria, such as flat or south-facing rooftop or other unshaded space on which to place the PV panels. In our opinion, the facility does appear not meet these minimum criteria for cost-effective PV installation.

Figure 23 - Photovoltaic Screening



Potential	Medium	
System Potential	80	kW DC STC
Electric Generation	95,310	kWh/yr
Displaced Cost	$8,290	/yr
Installed Cost	$208,000	

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

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

6.2 Combined Heat and Power

Combined heat and power (CHP) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric generation from a CHP system is typically interconnected to local power distribution systems. Heat is recovered from exhaust and ancillary cooling systems and interconnected to the existing hot water (or steam) distribution systems.

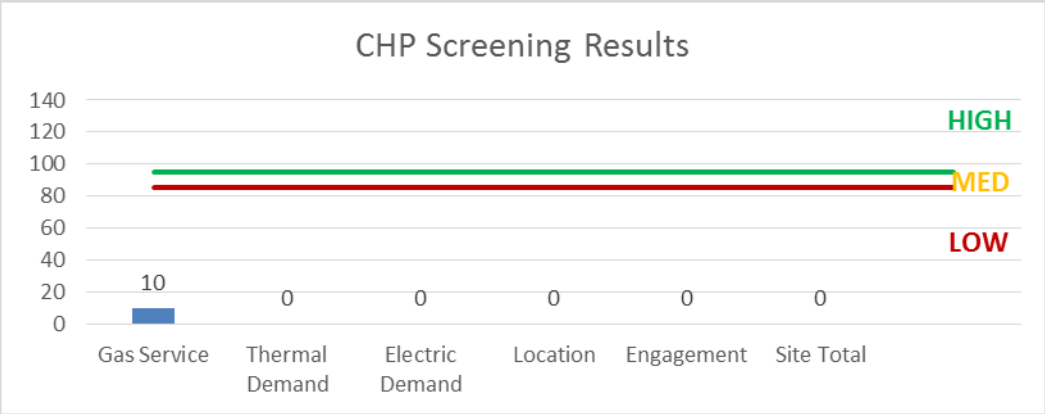
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

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

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

Figure 24 - CHP Screening Results



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.

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 25 for a list of the eligible programs identified for each recommended ECM.

Figure 25 - 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 Fluorescent Fixtures with LED Lamps and Drivers				x		
ECM 3	Retrofit Fixtures with LED Lamps	x			x		
ECM 4	Install LED Exit Signs				x		
ECM 5	Install Occupancy Sensor Lighting Controls	x			x		
ECM 6	Premium Efficiency Motors				x		
ECM 7	Install VFDs on Boiler Feedwater Pumps	x			x		
ECM 8	Install High Efficiency Electric AC				x		
ECM 9	Install High Efficiency Hot Water Boilers	x			x		
ECM 10	Install Dual Enthalpy Outside Economizer Control				x		
ECM 11	Install High Efficiency Gas Water Heater	x			x		
ECM 12	Install Low-Flow Domestic Hot Water Devices				x		
ECM 13	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 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 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) is an alternate method for New Jersey's government agencies to finance the implementation of energy conservation measures. An ESIP is a type of "performance contract," whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. This is done in a manner that ensures that annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive in year one, and every year thereafter. ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs can be leveraged to help further reduce the total project cost of eligible measures.

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

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

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

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

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

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

If your facility is not purchasing electricity from a third party supplier, consider shopping for a reduced rate from third party electric suppliers. If your facility is purchasing electricity from a third party supplier, review and compare prices at the end of the current contract or every couple years.

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

9.2 Retail Natural Gas Supply Options

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

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

If your facility is not purchasing natural gas from a third party supplier, consider shopping for a reduced rate from third party natural gas suppliers. If your facility is purchasing natural gas from a third party supplier, review and compare prices at the end of the current contract or every couple years.

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Entrance Exterior	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,970	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,970	0.02	109	0.0	$14.70	$96.40	$20.00	5.20
A608 - CR	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.77	3,988	0.0	$536.36	$1,754.00	$300.00	2.71
A611-CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
A613 - CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
A610-CR-Home EC	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.77	3,988	0.0	$536.36	$1,754.00	$300.00	2.71
A612 - Home EC	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.36	1,852	0.0	$249.03	$876.50	$150.00	2.92
A615 - CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
A614 - office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.22	1,139	0.0	$153.25	$584.00	$100.00	3.16
A607 - computer lab	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.77	3,988	0.0	$536.36	$1,754.00	$300.00	2.71
Custodial closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	52	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	52	0.02	2	0.0	$0.27	$58.50	$10.00	182.73
Janitors closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	52	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	52	0.02	2	0.0	$0.27	$58.50	$10.00	182.73
Faculty lounge	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.25	1,282	0.0	$172.40	$642.50	$110.00	3.09
A605 - CR	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.77	3,988	0.0	$536.36	$1,754.00	$300.00	2.71
Faculty women restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.03	32	0.0	$4.26	$174.50	$30.00	33.95
A603 - CR	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.77	3,988	0.0	$536.36	$1,754.00	$300.00	2.71
A604 CR	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.77	3,988	0.0	$536.36	$1,754.00	$300.00	2.71
Guidance office	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	26	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.71	3,703	0.0	$498.05	$1,637.00	$280.00	2.72
G312 - office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.11	570	0.0	$76.62	$350.00	$60.00	3.78
G310 Nurse office	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.19	1,014	0.0	$136.43	$526.50	$90.00	3.20
Bathroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	660	0.02	25	0.0	$3.37	$58.50	$10.00	14.40
G306-Business office	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
G304 - transportation	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.22	1,139	0.0	$153.25	$584.00	$100.00	3.16
G302- Accounts payable	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.22	1,139	0.0	$153.25	$584.00	$100.00	3.16
Suprintendent	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.08	427	0.0	$57.47	$291.50	$50.00	4.20
Men faculty restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	660	0.02	25	0.0	$3.37	$58.50	$10.00	14.40

	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
Entrance Exterior	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
General office	6	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	6	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	14	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	14	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	19	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	19	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	8	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	8	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
General office	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Security office	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	None	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
G303	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	None	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Safe	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,970	Fixture Replacement	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.01	58	0.0	$7.81	$62.42	$0.00	7.99
Safe	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,970	Fixture Replacement	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.04	202	0.0	$27.10	$83.43	$0.00	3.08
SAC office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.14	712	0.0	$95.78	$408.50	$70.00	3.53
Superintendent office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.22	1,139	0.0	$153.25	$584.00	$100.00	3.16
G602	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.08	427	0.0	$57.47	$291.50	$50.00	4.20
Assisstant principal's office	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
G316 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
G318	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
G307	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
G320	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
G309	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
G322 - Foreign laguage office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.22	1,139	0.0	$153.25	$584.00	$100.00	3.16
F701	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.05	285	0.0	$38.31	$233.00	$40.00	5.04
Boiler Room	39	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	39	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.84	4,396	0.0	$591.21	$2,281.50	$390.00	3.20
F702	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
F713 Chem lab	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	27	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.58	3,043	0.0	$409.30	$1,579.50	$270.00	3.20

	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
F715 Forensic & Anatomy	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.45	2,367	0.0	$318.34	$1,228.50	$210.00	3.20
Hallway	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.43	2,254	0.0	$303.19	$1,170.00	$200.00	3.20
Boys RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.03	32	0.0	$4.26	$174.50	$30.00	33.95
Principal office	8	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	8	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	12	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	12	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
F707	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	4	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	8	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	8	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway - library passage	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	None	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Camera room	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,970	0.04	198	0.0	$26.64	$126.40	$0.00	4.74
Boys RR	9	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	9	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	462	0.23	266	0.0	$35.74	$684.80	$20.00	18.60
Girls' RR	9	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	9	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	462	0.23	266	0.0	$35.74	$684.80	$20.00	18.60
F709	8	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,455	0.21	759	0.0	$102.13	$584.00	$100.00	4.74
F704	14	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,455	0.36	1,329	0.0	$178.72	$935.00	$160.00	4.34
Prep F704	3	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.06	222	0.0	$29.91	$175.50	$30.00	4.87
General Science	8	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	593	0.0	$79.75	$468.00	$80.00	4.87
Prep F711	3	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.06	222	0.0	$29.91	$175.50	$30.00	4.87
F706	14	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,455	0.36	1,329	0.0	$178.72	$935.00	$160.00	4.34
F709	8	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Occupancy Sensor	34	2,079	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,455	0.07	262	0.0	$35.24	$584.00	$100.00	13.73
F711	8	Linear Fluorescent - T5: 2' T5 (14W) - 2L	Occupancy Sensor	34	2,079	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,455	0.07	262	0.0	$35.24	$584.00	$100.00	13.73
Hallway	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
F713	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
F715 Forensic & Anatomy	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
Hallway - library passage	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	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
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.02	113	0.0	$15.16	$58.50	$10.00	3.20
E202 Math Office	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.38	1,994	0.0	$268.18	$935.00	$160.00	2.89
E204 CR	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	None	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
E201 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
E206 Computer lab	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.49	2,564	0.0	$344.80	$1,169.00	$200.00	2.81
E203 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.32	1,691	0.0	$227.39	$877.50	$150.00	3.20
Hallway	20	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	20	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
E208 CR	12	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.31	1,627	0.0	$218.84	$818.00	$140.00	3.10
E 205 Science Lab and prep	25	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	25	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.51	1,853	0.0	$249.21	$1,462.50	$250.00	4.87
E 205 Science Lab and prep	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.02	106	0.0	$14.24	$58.50	$10.00	3.41
E207 lab	19	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.39	1,408	0.0	$189.40	$1,111.50	$190.00	4.87
E207 lab	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.02	106	0.0	$14.24	$58.50	$10.00	3.41
E209 Science office	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.22	1,127	0.0	$151.59	$585.00	$100.00	3.20
Pantry	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.22	1,127	0.0	$151.59	$585.00	$100.00	3.20
E210 CR	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.49	2,564	0.0	$344.80	$1,169.00	$200.00	2.81
E211 CR	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	855	0.0	$114.93	$467.00	$80.00	3.37
E213 CR	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	855	0.0	$114.93	$467.00	$80.00	3.37
Women RR - Gym hall	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.05	63	0.0	$8.51	$233.00	$40.00	22.67
Hallway	18	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	18	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	208	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	208	0.02	8	0.0	$1.06	$58.50	$10.00	45.68
AD office	6	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	6	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Atheletic Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	146	0.16	60	0.0	$8.05	$467.00	$80.00	48.08
Hallway	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,079	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.11	394	0.0	$53.06	$292.50	$50.00	4.57
Trainers office	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,970	0.02	99	0.0	$13.32	$63.20	$0.00	4.74
Trainers office	6	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.12	445	0.0	$59.81	$351.00	$60.00	4.87

	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
Girls' team locker room	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,079	Relamp	No	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.32	1,183	0.0	$159.17	$877.50	$150.00	4.57
Coach's office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.11	570	0.0	$76.62	$350.00	$60.00	3.78
Storage closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.05	285	0.0	$38.31	$233.00	$40.00	5.04
Janitors closet	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	52	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	36	0.03	2	0.0	$0.32	$174.50	$30.00	452.55
Girl's PE locker room	19	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	No	19	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.39	2,012	0.0	$270.57	$1,111.50	$190.00	3.41
PE office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	855	0.0	$114.93	$467.00	$80.00	3.37
Boy's locker room	20	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.41	2,118	0.0	$284.81	$1,170.00	$200.00	3.41
PE office	4	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.08	296	0.0	$39.87	$234.00	$40.00	4.87
Men's locker room C803	24	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	No	24	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.49	2,541	0.0	$341.77	$1,404.00	$240.00	3.41
PE office	4	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.08	296	0.0	$39.87	$234.00	$40.00	4.87
Coach's office	4	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Occupancy Sensor	60	2,079	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.08	296	0.0	$39.87	$234.00	$40.00	4.87
Library	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	None	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library	31	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	2,970	None	No	31	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Conference	10	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	10	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym	68	LED - Fixtures: High-Bay	Wall Switch	50	2,970	None	No	68	LED - Fixtures: High-Bay	Wall Switch	50	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym	4	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	201	0.0	$27.10	$430.22	$0.00	15.88
Trainers office	1	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.00	50	0.0	$6.77	$107.56	$0.00	15.88
Girls' team locker room	2	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	101	0.0	$13.55	$215.11	$0.00	15.88
Boys' locker room	3	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.01	151	0.0	$20.32	$322.67	$0.00	15.88
Men's locker room C803	5	Exit Signs: Fluorescent	None	11	8,760	Fixture Replacement	No	5	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	252	0.0	$33.87	$537.78	$0.00	15.88
Library	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
Library	20	LED Screw-In Lamps: Recessed fixture - 1 lamp	Occupancy Sensor	18	2,079	None	No	20	LED Screw-In Lamps: Recessed fixture - 1 lamp	Occupancy Sensor	18	2,079	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library	6	LED - Fixtures: Close to Ceiling Mount	Occupancy Sensor	151	2,079	None	No	6	LED - Fixtures: Close to Ceiling Mount	Occupancy Sensor	151	2,079	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Library Hallway	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	39	2,079	None	No	4	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	39	2,079	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library office	8	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	39	2,079	None	No	8	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	39	2,079	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library office - tech	6	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	39	2,079	None	No	6	LED - Fixtures: Ambient 2x2 Fixture	Occupancy Sensor	39	2,079	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	8	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	8	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
English Office H406	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	855	0.0	$114.93	$467.00	$80.00	3.37
H404 office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	855	0.0	$114.93	$467.00	$80.00	3.37
H402 office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	855	0.0	$114.93	$467.00	$80.00	3.37
Handicap RR Men	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.03	142	0.0	$19.16	$174.50	$30.00	7.54
Handicap RR Women	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.03	142	0.0	$19.16	$174.50	$30.00	7.54
H408	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.66	3,418	0.0	$459.74	$1,520.00	$260.00	2.74
H408	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	2,079	0.03	133	0.0	$17.87	$179.20	$20.00	8.91
H408	2	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.05	271	0.0	$36.47	$233.00	$40.00	5.29
Cafeteria	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.02	113	0.0	$15.16	$58.50	$10.00	3.20
Cafeteria	34	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	34	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,970	0.65	3,368	0.0	$452.94	$2,148.80	$0.00	4.74
Cafeteria	17	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	17	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	29	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	29	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.63	3,269	0.0	$439.62	$1,696.50	$290.00	3.20
Kitchen	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	4	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,970	0.08	396	0.0	$53.29	$252.80	$0.00	4.74
Stairway	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.04	225	0.0	$30.32	$117.00	$20.00	3.20
Hallway	16	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	16	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,970	0.30	1,585	0.0	$213.15	$1,011.20	$0.00	4.74
Theatre inside	40	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	40	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.87	4,508	0.0	$606.37	$2,340.00	$400.00	3.20
Theater hallway	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.22	1,127	0.0	$151.59	$585.00	$100.00	3.20
AV office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.09	451	0.0	$60.64	$234.00	$40.00	3.20
AV office	1	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.02	106	0.0	$14.24	$58.50	$10.00	3.41
Custodian	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.02	113	0.0	$15.16	$58.50	$10.00	3.20
Hallway	45	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	45	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
F721 computer lab	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.82	4,273	0.0	$574.67	$1,871.00	$320.00	2.70
F717 computer lab	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.98	5,127	0.0	$689.61	$2,222.00	$380.00	2.67
F718 CR	28	Linear Fluorescent - T5: 4' T5 (28W) - 2L	Wall Switch	60	2,970	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.73	3,797	0.0	$510.64	$1,754.00	$300.00	2.85
F716 CR	46	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	46	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	1.26	6,552	0.0	$881.17	$2,807.00	$480.00	2.64
SA office	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stairwell	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.02	113	0.0	$15.16	$58.50	$10.00	3.20
Stairwell	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	2	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	11	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	11	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Cafeteria	48	Compact Fluorescent: Recessed fixture - 1 lamp	Wall Switch	26	2,970	Relamp	No	48	LED Screw-In Lamps: Recessed fixture - 1 lamp	Wall Switch	7	2,970	0.60	3,115	0.0	$418.95	$2,580.14	$240.00	5.59
Hallway	23	Compact Fluorescent: Recessed fixture - 1 lamp	Wall Switch	26	2,970	Relamp	No	23	LED Screw-In Lamps: Recessed fixture - 1 lamp	Wall Switch	7	2,970	0.29	1,493	0.0	$200.75	$1,236.32	$115.00	5.59
Theatre entrance	8	Compact Fluorescent: Recessed fixture - 1 lamp	Wall Switch	26	2,970	Relamp	No	8	LED Screw-In Lamps: Recessed fixture - 1 lamp	Wall Switch	7	2,970	0.10	519	0.0	$69.82	$430.02	$40.00	5.59
Hallway	13	Compact Fluorescent: Recessed fixture - 1 lamp	Wall Switch	42	2,970	Relamp	No	13	LED Screw-In Lamps: Recessed fixture - 1 lamp	Wall Switch	11	2,970	0.26	1,376	0.0	$185.13	$698.79	$65.00	3.42
Hallway	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	Wall Switch	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
H408	1	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.00	50	0.0	$6.77	$107.56	$0.00	15.88
Cafeteria	2	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.01	101	0.0	$13.55	$215.11	$0.00	15.88
Kitchen	2	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.01	101	0.0	$13.55	$215.11	$0.00	15.88
Stairway	1	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.00	50	0.0	$6.77	$107.56	$0.00	15.88
Hallway	4	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.01	201	0.0	$27.10	$430.22	$0.00	15.88
Theater hallway	8	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	8	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.03	403	0.0	$54.20	$860.44	$0.00	15.88
Hallway	1	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.00	50	0.0	$6.77	$107.56	$0.00	15.88
F718 CR	1	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.00	50	0.0	$6.77	$107.56	$0.00	15.88
F716 CR	1	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.00	50	0.0	$6.77	$107.56	$0.00	15.88
Stairwell	1	Exit Signs: Fluorescent	Wall Switch	11	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	Wall Switch	6	8,760	0.00	50	0.0	$6.77	$107.56	$0.00	15.88
Theatre inside	18	LED - Fixtures: High-Bay	Wall Switch	50	2,970	None	No	18	LED - Fixtures: High-Bay	Wall Switch	50	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Theatre inside	18	Halogen Incandescent: Wall hanging fixture	High/Low Control	250	2,079	Relamp	No	18	LED Screw-In Lamps: Wall hanging fixture	High/Low Control	94	2,079	1.84	6,714	0.0	$902.94	$1,937.75	$90.00	2.05

	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
Hallway	6	Compact Fluorescent: Wall mount fixture - 2 lamp	Wall Switch	52	2,970	Relamp	No	6	LED Screw-In Lamps: Wall mount fixture - 1 lamp	Wall Switch	11	2,970	0.16	840	0.0	$113.01	$322.52	$30.00	2.59
Janiotors closet	1	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	50	52	Fixture Replacement	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	52	0.02	2	0.0	$0.27	$78.46	$0.00	295.61
Storage	2	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	50	52	Fixture Replacement	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	52	0.04	4	0.0	$0.53	$156.92	$0.00	295.61
Storage	1	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	50	52	Fixture Replacement	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	52	0.02	2	0.0	$0.27	$78.46	$0.00	295.61
Boys' RR - 2nd floor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.11	127	0.0	$17.03	$350.00	$60.00	17.03
Girls' RR - 2nd floor	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.14	158	0.0	$21.28	$408.50	$70.00	15.90
D512 - CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D519 - CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D510 - CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
Hallway	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.30	1,578	0.0	$212.23	$819.00	$140.00	3.20
D517 - CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D508 - CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
English Office	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
D506 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D513 CR	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.11	570	0.0	$76.62	$350.00	$60.00	3.78
D504 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
D511 CR	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	26	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.71	3,703	0.0	$498.05	$1,637.00	$280.00	2.72
D504 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
D511 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D509 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D507 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D505 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D503 CR	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.27	1,424	0.0	$191.56	$701.00	$120.00	3.03
Hallway	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.38	1,994	0.0	$268.18	$935.00	$160.00	2.89
Hallway	22	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	22	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Women RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.11	127	0.0	$17.03	$350.00	$60.00	17.03
Men RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.08	95	0.0	$12.77	$291.50	$50.00	18.91
D501 - conference room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
Pantry	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	3	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,970	0.06	297	0.0	$39.97	$189.60	$0.00	4.74
Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.06	338	0.0	$45.48	$175.50	$30.00	3.20
D514 CR	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	855	0.0	$114.93	$467.00	$80.00	3.37
D516 CR	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.16	855	0.0	$114.93	$467.00	$80.00	3.37
D521 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D518 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D523 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D520 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D525 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D522 CR	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.41	2,136	0.0	$287.34	$993.50	$170.00	2.87
D524 history office	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
D527 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
D529 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
D526 CR	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.25	1,282	0.0	$172.40	$642.50	$110.00	3.09
Hallway	14	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	14	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway 100	6	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	6	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
B101 CR	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.87	4,558	0.0	$612.99	$1,988.00	$340.00	2.69
Storage closet	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	52	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	52	0.11	10	0.0	$1.33	$292.50	$50.00	182.73
B103 CR	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.49	2,564	0.0	$344.80	$1,169.00	$200.00	2.81
B105 computer lab	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
B102 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
B 104 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95

	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
B107 CR	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.44	2,279	0.0	$306.49	$1,052.00	$180.00	2.85
Dark room	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	208	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	208	0.35	126	0.0	$16.99	$936.00	$160.00	45.68
B109 CR	23	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	23	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.63	3,276	0.0	$440.58	$1,461.50	$250.00	2.75
B109 CR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.03	142	0.0	$19.16	$174.50	$30.00	7.54
Hallway	12	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	None	No	12	LED - Fixtures: Ambient 2x2 Fixture	Wall Switch	39	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
B106 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
B108 CR	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.33	1,709	0.0	$229.87	$818.00	$140.00	2.95
B110 A	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.08	427	0.0	$57.47	$291.50	$50.00	4.20
B110 B	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.08	427	0.0	$57.47	$291.50	$50.00	4.20
B110 C	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.08	427	0.0	$57.47	$291.50	$50.00	4.20
Women RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.08	95	0.0	$12.77	$291.50	$50.00	18.91
Women RR	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	462	0.03	30	0.0	$3.97	$179.20	$20.00	40.09
B114 office	29	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	Yes	29	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.79	4,130	0.0	$555.52	$1,812.50	$310.00	2.70
Men RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.08	95	0.0	$12.77	$291.50	$50.00	18.91
Men RR	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	660	Relamp	No	1	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	660	0.02	22	0.0	$2.96	$63.20	$0.00	21.35
Electrical room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.02	113	0.0	$15.16	$58.50	$10.00	3.20
Hallway	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,970	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.09	451	0.0	$60.64	$234.00	$40.00	3.20
C801 fixures center	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,079	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.09	316	0.0	$42.45	$234.00	$40.00	4.57
C801 fixures center	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,079	Relamp	No	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,079	0.39	1,420	0.0	$191.01	$1,053.00	$180.00	4.57
Women RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	660	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.03	32	0.0	$4.26	$174.50	$30.00	33.95
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	52	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	52	0.02	2	0.0	$0.27	$58.50	$10.00	182.73
Men RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	660	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.03	32	0.0	$4.26	$174.50	$30.00	33.95
Entrance square	27	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,970	Relamp	No	27	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,970	0.05	277	0.0	$37.21	$1,579.50	$270.00	35.19
Doorway	13	Compact Fluorescent: Recessed fixture - 1 lamp	Wall Switch	42	2,970	Relamp	Yes	13	LED Screw-In Lamps: Recessed fixture - 1 lamp	Occupancy Sensor	11	2,079	0.29	1,523	0.0	$204.83	$948.79	$650.00	1.46
Doorway	5	LED Screw-In Lamps: Recessed fixture - 1 lamp	Wall Switch	40	2,970	None	No	5	LED Screw-In Lamps: Recessed fixture - 1 lamp	Wall Switch	40	2,970	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

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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
Doorway	2	Compact Fluorescent: Recessed fixture - 1 lamp	Wall Switch	75	2,970	Relamp	Yes	2	LED Screw-In Lamps: Recessed fixture - 1 lamp	Occupancy Sensor	14	2,079	0.09	445	0.0	$59.90	$357.51	$100.00	4.30
Hallway 100	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	2,080	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	2,080	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
B109 CR	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	1,760	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	1,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
B107 CR	2	Exit Signs: Fluorescent	Wall Switch	11	1,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	Wall Switch	6	1,760	0.01	20	0.0	$2.72	$215.11	$0.00	79.02
B114 office	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	2,080	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	2,080	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	2,080	None	No	3	Exit Signs: LED - 2 W Lamp	Wall Switch	6	2,080	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library	4	LED - Fixtures: Close to Ceiling Mount	Occupancy Sensor	77	1,760	None	No	4	LED - Fixtures: Close to Ceiling Mount	Occupancy Sensor	77	1,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior Lights	8	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	50	4,368	None	No	8	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	50	4,368	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior Lights	2	LED Screw-In Lamps: Under the door fixtures - ceiling mount	Wall Switch	20	4,368	None	No	2	LED Screw-In Lamps: Under the door fixtures - ceiling mount	Wall Switch	20	4,368	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Exterior Lights	15	Metal Halide: (1) 250W Lamp	Wall Switch	295	4,368	Fixture Replacement	No	15	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	112	4,368	1.80	13,789	0.0	$1,854.52	$5,860.16	$1,500.00	2.35
Exterior Lights	1	Metal Halide: (1) 100W Lamp	Wall Switch	128	4,368	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	49	4,368	0.05	397	0.0	$53.37	$390.68	$100.00	5.45
Exterior Lights	7	Metal Halide: (1) 150W Lamp	Wall Switch	190	4,368	Fixture Replacement	No	7	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	49	4,368	0.65	4,958	0.0	$666.82	$2,734.74	$700.00	3.05
Exterior Lights	1	Metal Halide: (1) 50W Lamp	Wall Switch	72	4,368	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	40	4,368	0.02	161	0.0	$21.62	$390.68	$100.00	13.45
Exterior Lights	4	High-Pressure Sodium: (1) 250W Lamp	Wall Switch	295	4,368	Fixture Replacement	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	112	4,368	0.48	3,677	0.0	$494.54	$1,562.71	$400.00	2.35
Exterior Lights	6	High-Pressure Sodium: (1) 100W Lamp	Wall Switch	138	4,368	Fixture Replacement	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	49	4,368	0.35	2,682	0.0	$360.77	$2,344.06	$600.00	4.83
Exterior Lights	14	High-Pressure Sodium: (1) 150W Lamp	Wall Switch	188	4,368	Fixture Replacement	No	14	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	49	4,368	1.28	9,775	0.0	$1,314.72	$5,469.48	$1,400.00	3.10
Exterior Lights	5	High-Pressure Sodium: (1) 50W Lamp	Wall Switch	66	4,368	Fixture Replacement	No	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Wall Switch	40	4,368	0.09	653	0.0	$87.83	$1,953.39	$500.00	16.55
Parking lot	6	Metal Halide: (1) 250W Lamp	Wall Switch	295	4,368	Relamp	No	6	LED Screw-In Lamps: Pole fixture - 1 lamp	Wall Switch	90	4,368	0.81	6,179	0.0	$830.99	$645.92	$30.00	0.74
Parking lot	3	Metal Halide: (1) 400W Lamp	Wall Switch	458	4,368	Relamp	No	3	LED Screw-In Lamps: Pole fixture - 1 lamp	Wall Switch	200	4,368	0.51	3,888	0.0	$522.92	$322.96	$15.00	0.59
Parking lot lights rented from JCP&L	11	Metal Halide: (1) 250W Lamp	Wall Switch	295	4,368	Relamp	No	11	LED Screw-In Lamps: Pole fixture - 1 lamp	Wall Switch	90	4,368	1.48	11,327	0.0	$1,523.48	$1,184.18	$55.00	0.74
Parking lot lights rented from JCP&L	14	Metal Halide: (1) 400W Lamp	Wall Switch	458	4,368	Relamp	No	14	LED Screw-In Lamps: Pole fixture - 1 lamp	Wall Switch	200	4,368	2.37	18,144	0.0	$2,440.27	$1,507.14	$70.00	0.59

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	Boiler water	2	Heating Hot Water Pump	15.0	91.0%	No	3,391	Yes	91.0%	Yes	2	3.71	36,277	0.0	$4,879.16	$13,621.19	$3,600.00	2.05
Boiler Room	Air compressor	3	Air Compressor	1.5	85.5%	No	4,957	No	85.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boiler water	2	Heating Hot Water Pump	10.0	90.2%	Yes	3,391	No	90.2%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boiler water	1	Heating Hot Water Pump	5.0	88.5%	No	2,745	No	88.5%	Yes	1	0.64	5,033	0.0	$676.87	$3,275.85	$775.00	3.69
Boiler Room	Boiler water	1	Heating Hot Water Pump	5.0	88.5%	No	2,745	Yes	89.5%	Yes	1	0.65	5,064	0.0	$681.05	$4,196.91	$775.00	5.02
Boiler Room	Boiler water	2	Heating Hot Water Pump	3.0	85.5%	No	2,745	No	85.5%	Yes	2	0.79	6,251	0.0	$840.75	$6,015.30	$0.00	7.15
Boiler Room	Domestic hot water heater	4	Water Supply Pump	0.5	77.0%	Yes	2,745	No	77.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Elevator room	Elevator	1	Other	15.0	90.0%	No	3,391	No	90.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classrooms	Unitvents	80	Supply Fan	0.3	77.0%	No	2,745	No	77.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Attic spaces	various	4	Supply Fan	7.5	88.5%	0	4,500	No	88.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Grounds	General Office and Security office	1	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
A614	A614	1	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	Faculty Lounge	1	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	G312, G310	1	Split-System AC	1.60		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	G306, G304	2	Split-System AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	G302	1	Split-System AC	2.00		Yes	1	Split-System AC	2.00		16.00		No	0.64	1,088	0.0	$146.26	$2,992.44	$184.00	19.20
Grounds	Superintendent secretary	1	Split-System AC	1.00		Yes	1	Split-System AC	1.00		16.00		No	0.32	544	0.0	$73.13	$1,496.22	$92.00	19.20
Grounds	Suprintendent office	1	Ductless Mini-Split HP	1.00	8.30	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	Faculty Lounge G303	1	Ductless Mini-Split AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	SAC	2	Split-System AC	1.00		Yes	2	Split-System AC	1.00		16.00		No	0.64	1,088	0.0	$146.26	$2,992.44	$184.00	19.20
Grounds	Guidance office	4	Split-System AC	4.00		Yes	4	Split-System AC	4.00		16.00		No	0.00	0	0.0	$0.00	$23,939.52	$1,472.00	0.00
Grounds	Principal's office	2	Split-System AC	1.00		Yes	2	Split-System AC	1.00		16.00		No	0.64	1,088	0.0	$146.26	$2,992.44	$184.00	19.20
Grounds	G602 and one section of Assisstant principal's office	1	Split-System AC	1.50		Yes	1	Split-System AC	1.50		16.00		No	0.00	0	0.0	$0.00	$2,244.33	$138.00	0.00
Grounds	2nd section of assisstant principal's office	1	Split-System AC	1.30		Yes	1	Split-System AC	1.30		16.00		No	0.00	0	0.0	$0.00	$1,945.09	$119.60	0.00
Grounds	G322 - Foreign Language office	1	Split-System AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	CR 204	1	Split-System AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	Math office - Room 202	1	Split-System AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	F707	1	Split-System AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
E209	E209	1	Window AC	1.25		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	AD's office	1	Split-System AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rooftop	Trainer's Office, Coach's office	2	Split-System AC	0.75		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Men's and women's locker room, Men's coach's office,PE office, Coac's office	5	Split-System AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Lab room	2	Split-System AC	4.00		Yes	2	Split-System AC	4.00		16.00		No	1.72	2,908	0.0	$391.15	$11,969.76	$736.00	28.72
Rooftop	APC	1	Split-System Air-Source HP	2.50	31.20	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Computer Lab	1	Split-System AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	English office	2	Split-System AC	2.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Music Room H408	Music Room H408	2	Window AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	Kitchen office	1	Split-System AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Grounds	Room 717 and 721	1	Split-System AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
D573	D573	1	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	D504	2	Split-System AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
D524	History office	1	Split-System AC	1.50		Yes	1	Split-System AC	1.50		16.00		No	0.45	763	0.0	$102.68	$2,244.33	$138.00	20.51
Rooftop	Faculty upstairs, Schleig Conference	2	Packaged AC	5.00		Yes	2	Packaged AC	5.00		14.00		No	2.14	3,612	0.0	$485.75	$22,689.60	$920.00	44.82
Rooftop	Room 711,709,205,207,710,708, 706,704	8	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Rooms 102,104,105,106,107,108, 109	7	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	713, 715	4	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	402,403,406 , Music room	4	Packaged AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Fitness center	1	Packaged AC	12.50		Yes	1	Packaged AC	12.50		13.00		Yes	2.12	5,563	0.0	$748.22	$18,323.13	$1,237.50	22.84
Rooftop	Special Ed offices	1	Packaged AC	7.50		Yes	1	Packaged AC	7.50		13.00		Yes	1.82	4,263	0.0	$573.39	$14,115.79	$797.50	23.23

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	Monmouth RSD	2	Non-Condensing Hot Water Boiler	12,500.00	Yes	2	Condensing Hot Water Boiler	12,500.00	93.00%	Ec	0.00	0	943.7	$10,061.32	$458,326.43	$0.00	45.55

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	Restrooms and kitchen	1	Storage Tank Water Heater (> 50 Gal)	Yes	1	Storage Tank Water Heater (> 50 Gal)	Natural Gas	90.00%	Et	0.00	0	111.2	$1,185.46	$16,135.42	$563.50	13.14

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
A610,A612,Faculty lounge, Guidance office pantry, Trainer's office, Faculty Room , Conference room pantry, Fitness office	15	Faucet Aerator (Kitchen)	2.50	2.20	0.00	0	6.5	$69.24	$107.55	$0.00	1.55
Faculty women RR, Faculty Women RR, Men Faculty Women RR, Women RR - Gym Hall, Handicapped Boys' RR, Handicapped Girls' RR, Women RR, Men RR, Women RR, Men RR	18	Faucet Aerator (Lavatory)	2.50	1.00	0.00	0	39.0	$415.44	$129.06	$0.00	0.31
A608 - CR	1	Faucet Aerator (Lavatory)	3.00	1.00	0.00	0	2.9	$30.77	$7.17	$0.00	0.23

Walk-In Cooler/Freezer Inventory & Recommendations

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

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
Home Ec Room	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	1	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
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	1	Freezer Chest	No	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
Home Ec Room	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Home Ec Room	1	Electric Griddle (≤2 Feet Width)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Home Ec Room	1	Gas Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	3	Insulated Food Holding Cabinet (1/2 Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Gas Convection Oven (Half Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Electric Combination Oven/Steam Cooker (<15 Pans)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Gas Steamer	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	1	Multi-Tank Conveyor (High Temp)	Natural Gas	Natural Gas	No	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?
Monmouth RHSD	303	Computer	75.0	Yes
Monmouth RHSD	40	Laptop	40.0	Yes
Monmouth RHSD	7	Printer - small	20.0	Yes
Monmouth RHSD	54	Printer - medium	40.0	Yes
Monmouth RHSD	7	Printer - big	200.0	Yes
Monmouth RHSD	67	Projector	200.0	Yes
Monmouth RHSD	32	Microwave	900.0	No
Monmouth RHSD	6	Refrigerator - small	27.6	No
Monmouth RHSD	15	Refrigertor - medium	40.0	No
Monmouth RHSD	15	Refrigerator - large	70.0	No
Monmouth RHSD	1	Refrigerator - Double door	100.0	Yes
Monmouth RHSD	8	Coffee machine	400.0	Yes
Monmouth RHSD	4	Toaster oven	1,200.0	No
Monmouth RHSD	1	Clothes washer	900.0	No
Monmouth RHSD	1	Clothes dryer	1,600.0	No
Monmouth RHSD	3	Dishwasher	1,000.0	No
Monmouth RHSD	73	TV - CRT	120.0	No
Monmouth RHSD	1	TV - LCD	120.0	Yes
Monmouth RHSD	4	TV - LED	120.0	Yes
Monmouth RHSD	10	Hot and cold water dispenser	12.5	No
Monmouth RHSD	56	Smart board	5.0	Yes
Monmouth RHSD	5	Ceiling fans	30.0	No
Monmouth RHSD	4	Electric Stove/oven set	2,000.0	No
Monmouth RHSD	6	Tredmills	2,000.0	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
Faculty Lounge	2	Refrigerated	Yes	0.00	3,224	0.0	$433.57	$460.00	$0.00	1.06
Faculty Lounge	3	Non-Refrigerated	Yes	0.00	1,028	0.0	$138.20	$690.00	$0.00	4.99
D503	1	Refrigerated	Yes	0.00	1,612	0.0	$216.79	$230.00	$0.00	1.06
D503	1	Non-Refrigerated	Yes	0.00	343	0.0	$46.07	$230.00	$0.00	4.99

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Monmouth Regional High School District

Primary Property Type: K-12 School
Gross Floor Area (ft²): 192,441
Built: 1960

For Year Ending: May 31, 2016
Date Generated: April 03, 2017

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
Monmouth Regional High School District 1 Norman Field Way Tinton Falls, New Jersey 07724	_____ , (___)___-_____	___ _____ , (___)___-_____ _____

Property ID: 5836496

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
72.4 kBtu/ft²

Source EUI
137 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	5,618,366 (40%)
Natural Gas (kBtu)	8,310,074 (60%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	83.1
National Median Source EUI (kBtu/ft²)	157.3
% Diff from National Median Source EUI	-13%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	441

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)