Local Government Energy Audit:
Energy Audit Report

Edgar Middle School

49 Brunswick Ave

Metuchen, NJ 08840

Metuchen Board of Education

February 8, 2019

Final Report by:

TRC Energy Services

Disclaimer

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

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

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

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

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

Table of Contents

Table of Figures

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Edgar Middle 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 public schools in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

Edgar Middle School is a 77,360 square foot facility comprised of various space types including classrooms, offices, locker rooms, a cafeteria, a gymnasium, a media center, a commercial kitchen, and mechanical and storage spaces.

Lighting at Edgar Middle School consists of aging and inefficient linear fluorescent lighting as well as some compact fluorescent fixtures. Heating is supplied by four hot water boilers, and cooling is supplied by a mixture of packaged rooftop units and split-system air conditioners. 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 11 measures and recommends nine measures which together represent an opportunity for Edgar Middle School to reduce annual energy costs by $29,120 and annual greenhouse gas emissions by 211,755 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 3.7 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 Edgar Middle School's annual energy use by 10%.

Figure 1 – Previous 12 Month Utility Costs

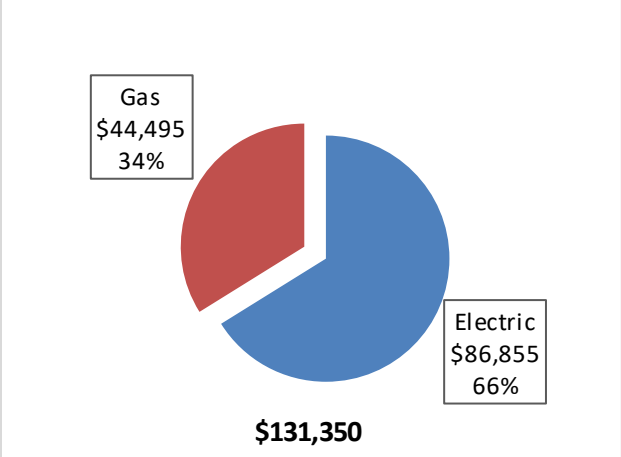
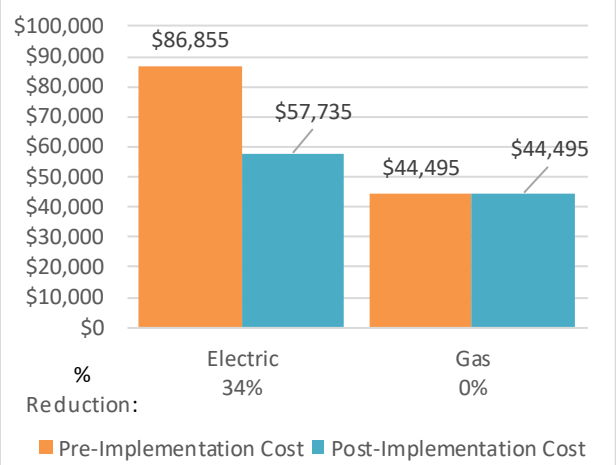


Figure 2 – Potential Post-Implementation Costs



A detailed description of Edgar Middle School's existing energy use can be found in Section 3.

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

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**146,607**	**34.1**	**0.0**	**$20,301.92**	**$67,206.95**	**$15,120.00**	**$52,086.95**	**2.6**	**147,632**
ECM 1	Install LED Fixtures	Yes	9,179	1.9	0.0	$1,271.07	$9,518.05	$1,000.00	$8,518.05	6.7	9,243
ECM 2	Retrofit Fixtures with LED Lamps	Yes	137,428	32.1	0.0	$19,030.85	$57,688.90	$14,120.00	$43,568.90	2.3	138,389
Lighting Control Measures			**33,697**	**7.5**	**0.0**	**$4,666.30**	**$45,446.00**	**$3,915.00**	**$41,531.00**	**8.9**	**33,933**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	27,338	6.5	0.0	$3,785.76	$38,146.00	$3,395.00	$34,751.00	9.2	27,529
ECM 4	Install Daylight Dimming Controls	Yes	1,902	0.3	0.0	$263.35	$2,500.00	$520.00	$1,980.00	7.5	1,915
ECM 5	Install High/Low Lighitng Controls	Yes	4,457	0.8	0.0	$617.19	$4,800.00	$0.00	$4,800.00	7.8	4,488
Motor Upgrades			**687**	**0.1**	**0.0**	**$95.08**	**$2,307.58**	**$0.00**	**$2,307.58**	**24.3**	**691**
ECM 6	Premium Efficiency Motors	Yes	687	0.1	0.0	$95.08	$2,307.58	$0.00	$2,307.58	24.3	691
Variable Frequency Drive (VFD) Measures			**26,877**	**4.4**	**0.0**	**$3,721.82**	**$12,810.35**	**$1,200.00**	**$11,610.35**	**3.1**	**27,064**
ECM 7	Install VFDs on Constant Volume (CV) HVAC	Yes	7,448	2.0	0.0	$1,031.44	$5,194.45	$1,200.00	$3,994.45	3.9	7,500
ECM 8	Install VFDs on Hot Water Pumps	Yes	19,428	2.5	0.0	$2,690.38	$7,615.90	$0.00	$7,615.90	2.8	19,564
Electric Unitary HVAC Measures			**25,091**	**16.5**	**0.0**	**$3,474.58**	**$114,956.04**	**$4,954.00**	**$110,002.04**	**31.7**	**25,267**
	Install High Efficiency Electric AC	No	24,858	16.2	0.0	$3,442.35	$112,556.86	$4,862.00	$107,694.86	31.3	25,032
	Install High Efficiency Heat Pumps	No	233	0.3	0.0	$32.23	$2,399.18	$92.00	$2,307.18	71.6	234
Plug Load Equipment Control - Vending Machine			**2,418**	**0.0**	**0.0**	**$334.81**	**$460.00**	**$0.00**	**$460.00**	**1.4**	**2,435**
ECM 9	Vending Machine Control	Yes	2,418	0.0	0.0	$334.81	$460.00	$0.00	$460.00	1.4	2,435
TOTALS FOR HIGH PRIORITY MEASURES			**210,285**	**46.2**	**0.0**	**$29,119.92**	**$128,230.88**	**$20,235.00**	**$107,995.88**	**3.7**	**211,755**
TOTALS FOR ALL EVALUATED MEASURES			**235,376**	**62.7**	**0.0**	**$32,594.50**	**$243,186.91**	**$25,189.00**	**$217,997.91**	**6.7**	**237,021**

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

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

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

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

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

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

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

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

Energy Efficient Practices

TRC also identified 10 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 Edgar Middle School include:

- Reduce Air Leakage
- Use Window Treatments/Coverings
- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Use Fans to Reduce Cooling Load
- Clean Evaporator/Condenser Coils on AC Systems
- 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 Edgar Middle 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	162	kW DC STC
Electric Generation	121,896	kWh/yr
Displaced Cost	$10,600	/yr
Installed Cost	$631,800	

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

1.3 Implementation Planning

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

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

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

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

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

This facility may also qualify for the Direct Install program which can provide turnkey installation of multiple measures, through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70% of the cost of selected measures, although measure eligibility will have to be assessed and be verified by the designated Direct Install contractor and, in most cases, they will perform the installation work.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.4 for additional information on the ESIP Program.

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

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Michael Havier	Business Administrator	maharvier@metboe.k12.nj.us	732-321-8700 ext. 1011
Designated Representative			
Gerard Redmond	Maintenance Supervisor	N/A	732-261-7311
TRC Energy Services			
Alexander Klieverik	Auditor	aklieverik@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On August 15, 2018, TRC performed an energy audit at Edgar Middle School located in Metuchen, New Jersey. TRC's team met with Gerard Redmond, Maintenance Supervisor to review the facility operations and help focus our investigation on specific energy-using systems.

Edgar Middle School is a 77,360 square foot facility comprised of various space types including classrooms, offices, locker rooms, a cafeteria, a gymnasium, a media center, a commercial kitchen, and mechanical and storage spaces.

The building was originally constructed in 1916. Some renovations were made in 2014 and 2016, which include new condensing hot water boilers and a new domestic hot water heater. The facility has replaced its T12 fluorescent fixtures with T8 fluorescent fixtures over the last few years. The site is interested in more lighting controls but has been unable to fund the project.

2.3 Building Occupancy

The building is open seven days per week. The typical schedule is presented in the table below. The building is used 10 months per year, while only maintenance staff and cleaning crews are in the building during the summer. During a typical day, the facility is occupied by 100 staff and 727 students.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Edgar Middle School	Weekday	6:30 AM to 11:00 PM
Edgar Middle School	Weekend	8:00 AM to 8:00 PM

2.4 Building Envelope

The building is constructed of concrete block and structural steel with a brick facade. The building has flat roof sections covered with black membrane that is in good condition. The buildings have double-pane windows which are in good condition and show little sign of excessive infiltration. The exterior doors are constructed of aluminum, some with glass panes, and are in good condition.

2.5 On-Site Generation

Edgar Middle School does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

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

Lighting System

Lighting at the facility is provided mostly by 32-Watt linear fluorescent T8 lamps with electronic ballasts as well as some compact fluorescent lamps (CFL). Most of the fixtures are 2-lamp or 3-lamp, 4-foot long troffers with diffusers. The gymnasium is the only area with 4-foot T5 high-output fluorescent lighting with 6-lamp fixtures.

Lighting control in most spaces is provided by wall switches. The only area of the building with occupancy sensors is the cafeteria/MPR. Stairwells, corridors, and main lobby areas are controlled by switches and are on approximately 12 hours per day while the building is open.

The building's exterior lighting consists primarily of compact fluorescent fixtures located near doors and the entry area. There are also some metal halide wall pack fixtures on the building and high-pressure sodium lamps in fixtures in the parking lot. All exterior compact fluorescent fixtures and metal halide wall packs are manually controlled by wall switches. Parking lot lighting is controlled by photocells.

Hot Water Heating System

The hot water system consists of four Fulton 1,850 kBtu/hr output, condensing boilers. The boilers have a nominal combustion efficiency of 92.5%. The hot water system is configured in a constant flow primary distribution with two 10 HP hot water pumps. Hot water is supplied at 180°F when the outside air temperature is below 55°F and the setpoint is reset to 160°F when the outside air is above 55°F. The boilers operate in a lead/lag configuration. Three boilers may be required during cold weather. The lead boiler is rotated based on run hours. The boilers are in good condition and well maintained.

The boilers provide hot water to a rooftop air handler, two packaged units, and to perimeter unit ventilators throughout the building. There are two Trane packaged units with hot water coils providing heat to the gymnasium. The packaged units supply constant volume air, and have one 7.5 HP supply fan, and one 5 HP exhaust fan each. The locker rooms are served by a single constant-volume air handler unit (AHU) with a 5 HP supply fan and a 2 HP return fan.

Direct Expansion Air Conditioning System (DX)

Two 10-ton Trane direct-expansion (DX) package units with outside air economizers are used to condition the gymnasium. The units are located on the roof above the gymnasium and provide constant air volume with a 7.5 hp supply fan and a 5 hp exhaust fan. The library and main office are served by two 10-ton AAAON direct-expansion (DX) packaged units, each with a 3 HP supply fan. The main office unit also has a 2 HP exhaust fan. The nurse's office and music rooms are served by AAON direct-expansion packaged units. The nurse's office has a capacity of 6 tons, while the music room has a 5-ton capacity unit. All units utilize a scroll compressor and a DX coil.

The packaged units are controlled by programmable thermostats located in the spaces served. The thermostats are set to maintain a setpoint between 72°F and 74°F.

There are three 5-ton cooling only split system air conditioners used to condition the computer lab, faculty room, and classrooms 113 & 114. The fan and evaporator are in the drop ceiling of the space. The compressor and condensing unit are located on the roof. The units provide constant air volume with a single 1/4 HP supply fan. The units are manually controlled by a thermostat located in the zones. The units operate on-demand to maintain a space temperature setpoint around 75°F (adjustable by staff).

There are five rooms with window air conditioners installed. Each window unit has a capacity of 12,000 Btu/hr with a rated efficiency of 12 SEER.

Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of one PVi model 54L125A-MXG gas-fired storage water heater with an input rating of 540 kBtu/hr and a nominal efficiency of 92%. The water heater has a 125-gallon storage tank. One 1/8 HP recirculation pump distributes 120°F water to the entire building. The recirculation pumps operate based on an aquastat set to 110°F.

Food Service Equipment

The school has an all-electric kitchen that is used to keep lunches warm for students. The kitchen receives prepared food from the high school. There are two serving trays, one insulated holding cabinet, and a warming rack. In addition to the warming equipment, there is a chest refrigerator, chest freezer, a double-door refrigerator, and novelty cooler for beverages and ice cream.

Building Plug Load

There are 201 desktop computer work stations with LCD monitors throughout the facility with no centralized PC power management software installed.

There are 300 Chromebooks used by students scattered throughout the facility. There are also 40 projectors, 27 desk printers, four photocopiers, seven LCD televisions, six smartboards, and 25 security cameras throughout the building.

The woodshop contains various equipment including a lathe, two drill presses, two sanders, plainer, three jigsaws, band saw, table saw, and a grinder. The art room contains a 11kW kiln used a few times per year for student projects.

The building has two glass-front refrigerated beverage vending machines located in the faculty room. There are no controls installed on vending machines.

2.7 Water-Using Systems

There are 24 restrooms at this facility. A sampling of restrooms found that the faucets are rated for 2.0 gallons per minute (gpm) or lower, the toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at 1.6 gpf. The school has a girls and boys locker room with three showers each. The showerheads in both locker rooms are rated at 2.5 gpm. According to on site staff, the showers are rarely used.

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

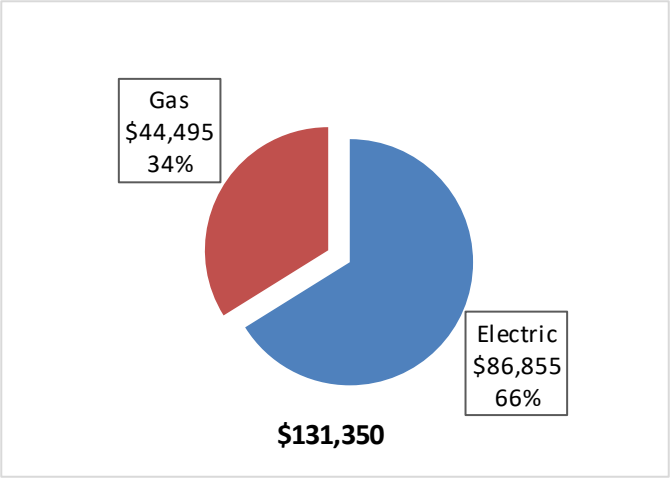
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Edgar Middle School		
Fuel	**Usage**	**Cost**
Electricity	627,207 kWh	$86,855
Natural Gas	51,403 Therms	$44,495
Total		**$131,350**

The current annual energy cost for this facility is $131,350 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost over the past 12 months was $0.138/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

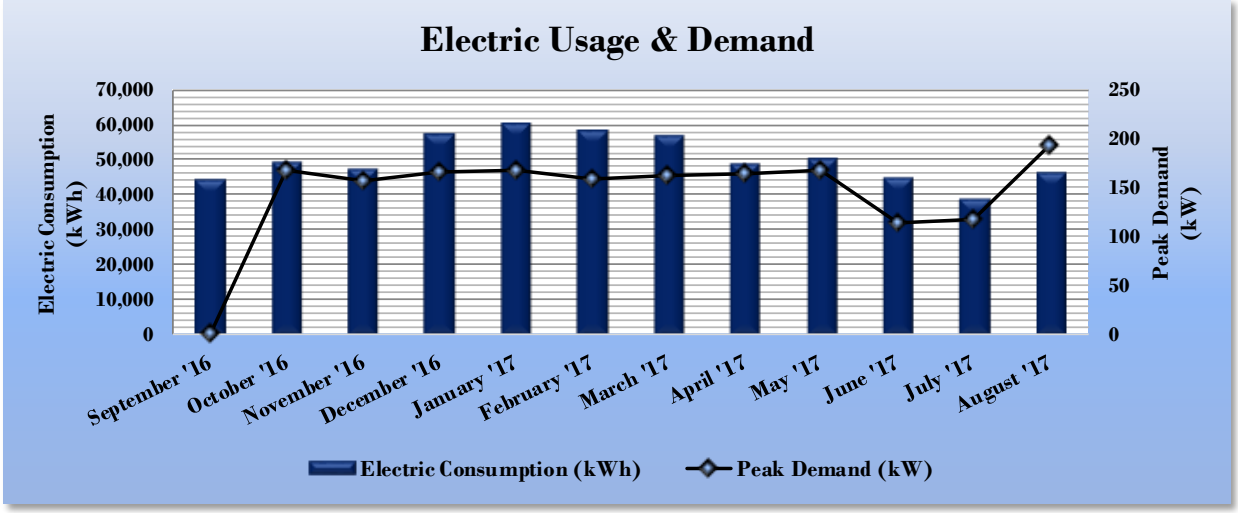


Figure 10 - Electric Usage & Demand

Electric Billing Data for Edgar Middle School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
9/29/16	30	44,525	0	$0	$6,336
10/31/16	32	49,527	167	$0	$6,288
12/1/16	31	47,482	157	$0	$5,994
1/3/17	33	57,509	166	$0	$7,476
2/1/17	29	60,665	169	$0	$7,545
3/3/17	30	58,429	158	$0	$7,258
4/3/17	31	56,899	162	$0	$7,119
5/3/17	30	49,174	164	$0	$6,431
5/19/17	16	50,384	168	$0	$8,083
6/20/17	32	44,922	115	$0	$6,816
7/20/17	30	38,711	118	$0	$6,173
8/17/17	28	46,642	192	$0	$8,244
Totals	**352**	**604,869**	**192.2**	**$0**	**$83,761**
Annual	**365**	**627,207**	**192.2**	**$0**	**$86,855**

3.3 Natural Gas Usage

Natural gas is provided by Elizabethtown Gas. The average gas cost for the past 12 months is $0.866/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

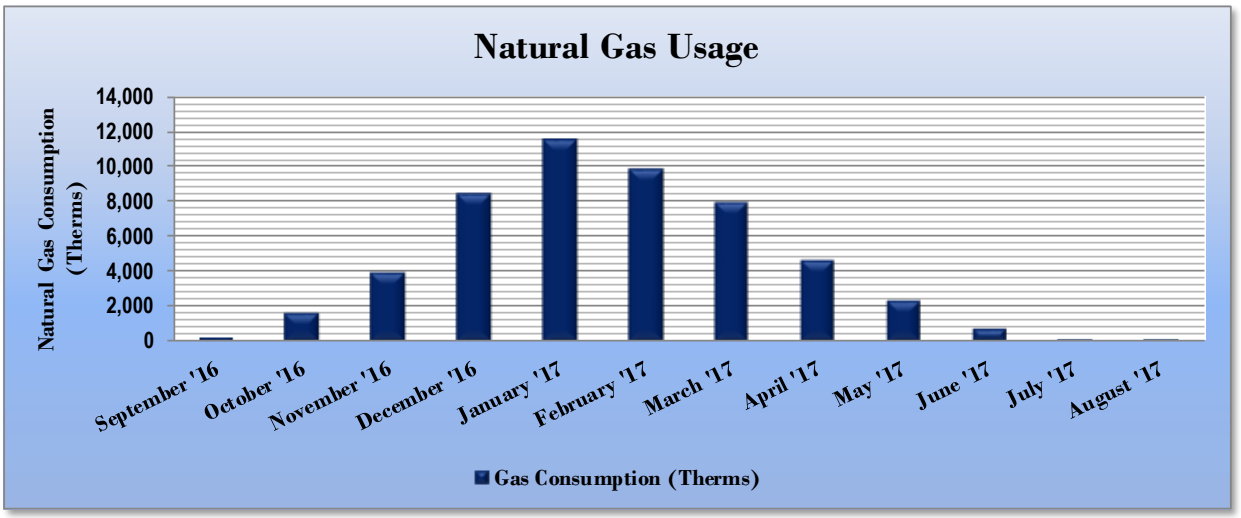


Figure 12 - Natural Gas Usage

Gas Billing Data for Edgar Middle School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
9/20/16	32	192	$526
10/19/16	29	1,678	$1,652
11/17/16	29	3,920	$3,386
12/19/16	32	8,442	$6,855
1/19/17	31	11,617	$9,362
2/19/17	31	9,904	$8,036
3/18/17	27	7,953	$6,548
4/19/17	32	4,668	$3,987
5/18/17	29	2,335	$2,217
6/19/17	32	719	$1,013
7/19/17	30	120	$571
8/21/17	33	138	$587
Totals	**367**	**51,685**	**$44,739**
Annual	**365**	**51,403**	**$44,495**

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		
	Edgar Middle School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	156.6	141.4
Site Energy Use Intensity (kBtu/ft^2)	94.1	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		
	Edgar Middle School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	127.5	141.4
Site Energy Use Intensity (kBtu/ft^2)	84.8	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75% of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. Your building is one of the building categories that are eligible to receive a score. This facility has a current score of **19**.

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

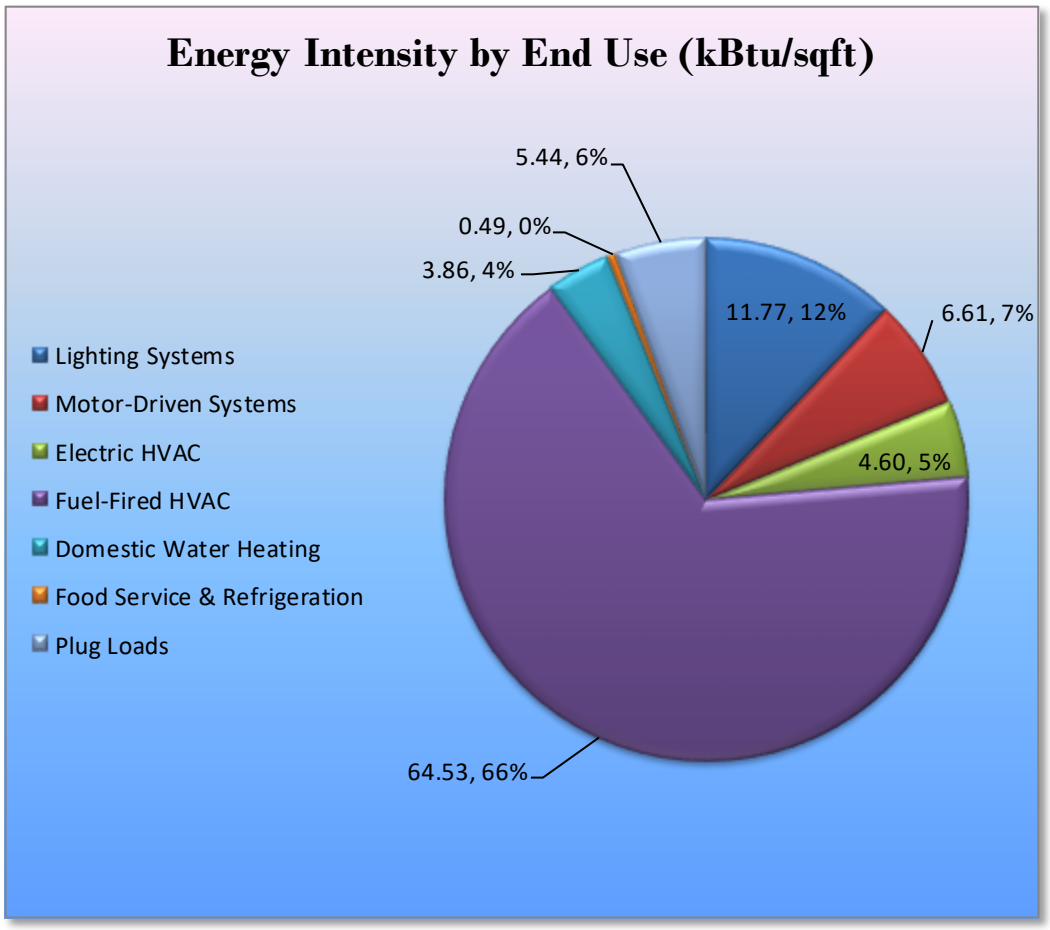
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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 Edgar Middle School regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016, approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 16 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**146,607**	**34.1**	**0.0**	**$20,301.92**	**$67,206.95**	**$15,120.00**	**$52,086.95**	**2.6**	**147,632**
ECM 1	Install LED Fixtures	9,179	1.9	0.0	$1,271.07	$9,518.05	$1,000.00	$8,518.05	6.7	9,243
ECM 2	Retrofit Fixtures with LED Lamps	137,428	32.1	0.0	$19,030.85	$57,688.90	$14,120.00	$43,568.90	2.3	138,389
Lighting Control Measures		**33,697**	**7.5**	**0.0**	**$4,666.30**	**$45,446.00**	**$3,915.00**	**$41,531.00**	**8.9**	**33,933**
ECM 3	Install Occupancy Sensor Lighting Controls	27,338	6.5	0.0	$3,785.76	$38,146.00	$3,395.00	$34,751.00	9.2	27,529
ECM 4	Install Daylight Dimming Controls	1,902	0.3	0.0	$263.35	$2,500.00	$520.00	$1,980.00	7.5	1,915
ECM 5	Install High/Low Lighitng Controls	4,457	0.8	0.0	$617.19	$4,800.00	$0.00	$4,800.00	7.8	4,488
Motor Upgrades		**687**	**0.1**	**0.0**	**$95.08**	**$2,307.58**	**$0.00**	**$2,307.58**	**24.3**	**691**
ECM 6	Premium Efficiency Motors	687	0.1	0.0	$95.08	$2,307.58	$0.00	$2,307.58	24.3	691
Variable Frequency Drive (VFD) Measures		**26,877**	**4.4**	**0.0**	**$3,721.82**	**$12,810.35**	**$1,200.00**	**$11,610.35**	**3.1**	**27,064**
ECM 7	Install VFDs on Constant Volume (CV) HVAC	7,448	2.0	0.0	$1,031.44	$5,194.45	$1,200.00	$3,994.45	3.9	7,500
ECM 8	Install VFDs on Hot Water Pumps	19,428	2.5	0.0	$2,690.38	$7,615.90	$0.00	$7,615.90	2.8	19,564
Plug Load Equipment Control - Vending Machine		**2,418**	**0.0**	**0.0**	**$334.81**	**$460.00**	**$0.00**	**$460.00**	**1.4**	**2,435**
ECM 9	Vending Machine Control	2,418	0.0	0.0	$334.81	$460.00	$0.00	$460.00	1.4	2,435
TOTALS		**210,285**	**46.2**	**0.0**	**$29,119.92**	**$128,230.88**	**$20,235.00**	**$107,995.88**	**3.7**	**211,755**

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

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

4.1.1 Lighting Upgrades

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

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**146,607**	**34.1**	**0.0**	**$20,301.92**	**$67,206.95**	**$15,120.00**	**$52,086.95**	**2.6**	**147,632**
ECM 1	Install LED Fixtures	9,179	1.9	0.0	$1,271.07	$9,518.05	$1,000.00	$8,518.05	6.7	9,243
ECM 2	Retrofit Fixtures with LED Lamps	137,428	32.1	0.0	$19,030.85	$57,688.90	$14,120.00	$43,568.90	2.3	138,389

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	9,179	1.9	0.0	$1,271.07	$9,518.05	$1,000.00	$8,518.05	6.7	9,243

Measure Description

We recommend replacing existing exterior fixtures containing 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 HID lamps.

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	135,983	31.9	0.0	$18,830.79	$56,453.12	$14,120.00	$42,333.12	2.2	136,934
Exterior	1,445	0.3	0.0	$200.06	$1,235.78	$0.00	$1,235.78	6.2	1,455

Measure Description

We recommend retrofitting existing incandescent, compact fluorescent, and linear fluorescent 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.

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

4.1.2 Lighting Control Measures

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

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**33,697**	**7.5**	**0.0**	**$4,666.30**	**$45,446.00**	**$3,915.00**	**$41,531.00**	**8.9**	**33,933**
ECM 3	Install Occupancy Sensor Lighting Controls	27,338	6.5	0.0	$3,785.76	$38,146.00	$3,395.00	$34,751.00	9.2	27,529
ECM 4	Install Daylight Dimming Controls	1,902	0.3	0.0	$263.35	$2,500.00	$520.00	$1,980.00	7.5	1,915
ECM 5	Install High/Low Lighitng Controls	4,457	0.8	0.0	$617.19	$4,800.00	$0.00	$4,800.00	7.8	4,488

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

ECM 3: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
27,338	6.5	0.0	$3,785.76	$38,146.00	$3,395.00	$34,751.00	9.2	27,529

Measure Description

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

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

ECM 4: Install Photosensor 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)
1,902	0.3	0.0	$263.35	$2,500.00	$520.00	$1,980.00	7.5	1,915

Measure Description

We recommend installing photosensor controls that operate electric lighting in exterior areas when ample daylight is present. Photosensor controls are recommended for exterior fixtures located on or near the building. This measure reduces energy use for exterior areas where sufficient lighting levels can be met by daylight.

ECM 5: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
4,457	0.8	0.0	$617.19	$4,800.00	$0.00	$4,800.00	7.8	4,488

Measure Description

We recommend installing occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons. Typical areas for such lighting control are stairwells and interior corridors.

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

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

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

4.1.3 Motor Upgrades

Our recommendations for premium efficiency motor upgrades are summarized in Figure 19 below.

Figure 19 – Summary of Premium Efficiency Motor 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)
Motor Upgrades		**687**	**0.1**	**0.0**	**$95.08**	**$2,307.58**	**$0.00**	**$2,307.58**	**24.3**	**691**
ECM 6	Premium Efficiency Motors	687	0.1	0.0	$95.08	$2,307.58	$0.00	$2,307.58	24.3	691

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)
687	0.1	0.0	$95.08	$2,307.58	$0.00	$2,307.58	24.3	691

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 (VFD)

For equipment with proposed VFDs, we have included replacing the controlled motor with a new motor —unless the existing motor meets or exceeds IHP 2014 standards—to conservatively account for the cost of an inverter duty rated motor. The savings and cost associated with the new motor are presented with the Premium Efficiency Motor measures. If the proposed VFD measure is not selected for implementation the motor replacement should be re-evaluated.

Our recommendations for variable frequency drive measures are summarized in Figure 20 below.

Figure 20 – 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		**26,877**	**4.4**	**0.0**	**$3,721.82**	**$12,810.35**	**$1,200.00**	**$11,610.35**	**3.1**	**27,064**
ECM 7	Install VFDs on Constant Volume (CV) HVAC	7,448	2.0	0.0	$1,031.44	$5,194.45	$1,200.00	$3,994.45	3.9	7,500
ECM 8	Install VFDs on Hot Water Pumps	19,428	2.5	0.0	$2,690.38	$7,615.90	$0.00	$7,615.90	2.8	19,564

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

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
7,448	2.0	0.0	$1,031.44	$5,194.45	$1,200.00	$3,994.45	3.9	7,500

Measure Description

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

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

ECM 8: Install VFDs on Hot Water 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)
19,428	2.5	0.0	$2,690.38	$7,615.90	$0.00	$7,615.90	2.8	19,564

Measure Description

We recommend installing variable frequency drives (VFD) to control hot water pumps. This measure requires that a majority of the hot water coils be served by two-way valves and that a differential pressure sensor is installed in the hot water loop. As the hot water valves close, the differential pressure increases. The VFD modulates pump speed to maintain a differential pressure setpoint. Energy savings results from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

4.1.5 Plug Load Equipment Control - Vending Machines

Our recommendations for plug load equipment controls are summarized in Figure 21 below.

Figure 21 – Summary of Plug Load Equipment Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		**2,418**	**0.0**	**0.0**	**$334.81**	**$460.00**	**$0.00**	**$460.00**	**1.4**	**2,435**
ECM 9	Vending Machine Control	2,418	0.0	0.0	$334.81	$460.00	$0.00	$460.00	1.4	2,435

ECM 9: 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)
2,418	0.0	0.0	$334.81	$460.00	$0.00	$460.00	1.4	2,435

Measure Description

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

4.2 ECMs Evaluated But Not Recommended

The measures below have been evaluated by the auditor but are not recommended for implementation at the facility. Reasons for exclusion can be found in each measure description section.

Figure 22 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Unitary HVAC Measures	**25,091**	**16.5**	**0.0**	**$3,474.58**	**$114,956.04**	**$4,954.00**	**$110,002.04**	**31.7**	**25,267**
Install High Efficiency Electric AC	24,858	16.2	0.0	$3,442.35	$112,556.86	$4,862.00	$107,694.86	31.3	25,032
Install High Efficiency Heat Pumps	233	0.3	0.0	$32.23	$2,399.18	$92.00	$2,307.18	71.6	234
TOTALS	**25,091**	**16.5**	**0.0**	**$3,474.58**	**$114,956.04**	**$4,954.00**	**$110,002.04**	**31.7**	**25,267**

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

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

Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
24,858	16.2	0.0	$3,442.35	$112,556.86	$4,862.00	$107,694.86	31.3	25,032

Measure Description

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

Reasons for not Recommending

The payback period for the measure exceeds the expected life of the replacement equipment.

Install High Efficiency Heat Pumps

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
233	0.3	0.0	$32.23	$2,399.18	$92.00	$2,307.18	71.6	234

Measure Description

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

Reasons for not Recommending

The payback period for the measure exceeds the expected life of the replacement equipment.

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.

Reduce Air Leakage

Air leakage, or infiltration, occurs when outside air enters a building uncontrollably through cracks and openings. Properly sealing such cracks and openings can significantly reduce heating and cooling costs, improve building durability, and create a healthier indoor environment. This includes caulking or installing weather stripping around leaky doors and windows allowing for better control of indoor air quality through controlled ventilation.

Use Window Treatments/Coverings

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

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.

Use Fans to Reduce Cooling Load

Utilizing ceiling fans to supplement cooling is a low cost strategy to reduce cooling load considerably. Thermostat settings can be increased by 4°F with no change in overall occupant comfort when the wind chill effect of moving air is employed for cooling.

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

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).

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.

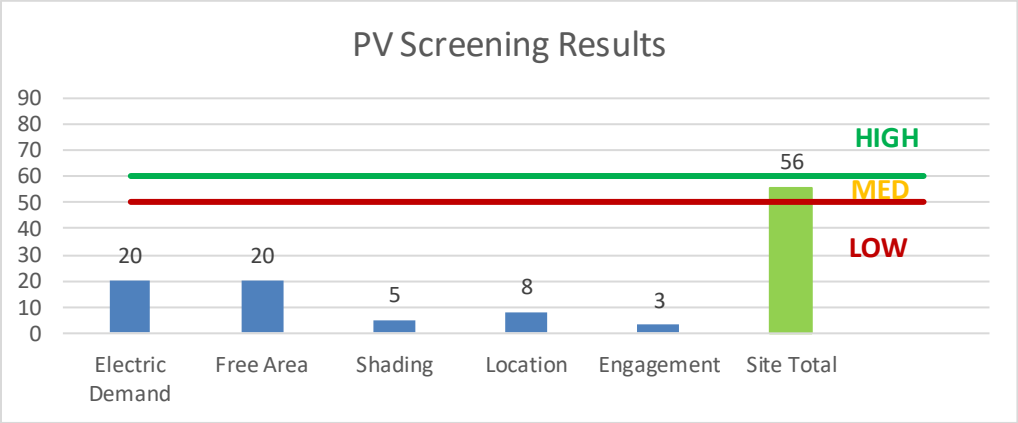
6.1 Photovoltaic

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 is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility's electrical distribution system. The amount of unobstructed area available determines how large of a solar array can be installed. The size of the array combined with the orientation, tilt, and shading elements determines the energy produced.

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

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the **Medium** potential for PV at the site. A PV array located on the roof of the main building/ground next to the building/over the main parking lot may be feasible. If Edgar Middle School is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 23 - Photovoltaic Screening



Potential	Medium	
System Potential	162	kW DC STC
Electric Generation	121,896	kWh/yr
Displaced Cost	$10,600	/yr
Installed Cost	$631,800	

Solar projects must register their projects in the SREC (Solar Renewable Energy Certificate) Registration Program (SRP) prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about developed new solar projects and insight into future SREC pricing. Refer to Section 8.3 for additional information.

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

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

6.2 Combined Heat and Power

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

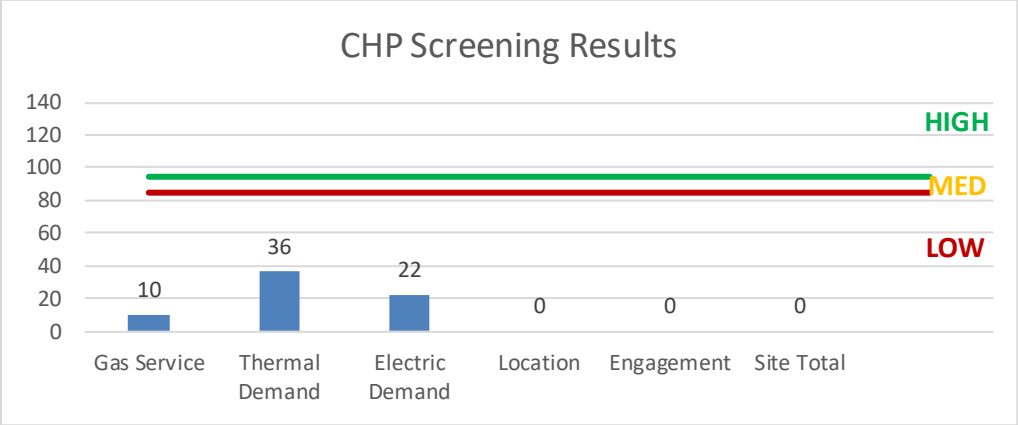
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

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 **Low** potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

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

Figure 24 - Combined Heat and Power Screening



7 DEMAND RESPONSE

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

By enabling grid operators to call upon Curtailment Service Providers and commercial facilities to reduce electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and participants receive payments whether or not their facility is called upon to curtail their electric usage.

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

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

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

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

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

It is the opinion of TRC that this building is not a good candidate for Demand Response (DR).

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					
ECM 2	Retrofit Fixtures with LED Lamps	X		X			
ECM 3	Install Occupancy Sensor Lighting Controls	X		X			
ECM 4	Install Daylight Dimming Controls	X		X			
ECM 5	Install High/Low Lighitng Controls			X			
ECM 6	Premium Efficiency Motors						
ECM 7	Install VFDs on Constant Volume (CV) HVAC						
ECM 8	Install VFDs on Hot Water Pumps						
ECM 9	Vending Machine Control						

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

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

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

8.1 SmartStart

Overview

The SmartStart program offers incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives from year to year for various energy efficiency equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

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

Incentives

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

Since your facility is an existing building, only the retrofit incentives have been applied in this report. Custom measure incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings, capped at 50% of the total installed incremental project cost, or a project cost buy down to a one year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

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

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

8.2 Direct Install

Overview

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

Incentives

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

How to Participate

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

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

8.3 SREC Registration Program

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

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

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

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar RPS. One way they can meet the RPS requirements is by purchasing SRECs. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period can and will fluctuate depending on supply and demand.

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

8.4 Energy Savings Improvement Program

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

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

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

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

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

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

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Main Office	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.21	892	0.0	$123.48	$868.64	$160.00	5.74
Main Office	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
Mail Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Main Office Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Principal's Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.16	684	0.0	$94.67	$489.09	$95.00	4.16
Principal's Office RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
VP Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.16	684	0.0	$94.67	$489.09	$95.00	4.16
Guidance Suite	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.30	1,253	0.0	$173.56	$941.67	$180.00	4.39
Guidance Suite	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
Special Services	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.22	912	0.0	$126.23	$562.12	$115.00	3.54
Psychologist Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Guidance Office 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Guidance Office 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Guidance Office RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Guidance Office Confrence Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.16	684	0.0	$94.67	$489.09	$95.00	4.16
Boiler Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.27	1,329	0.0	$184.08	$905.15	$100.00	4.37
Boiler Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Maintenance Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.11	532	0.0	$73.63	$416.06	$75.00	4.63
Maintenance Office	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
Gym	24	Linear Fluorescent - T5HO: 4' T5HO (54W) - 6L	Wall Switch	358	2,772	Relamp	Yes	24	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	1,940	4.67	22,730	0.0	$3,147.66	$2,849.08	$755.00	0.67
Gym	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
Gym Storage 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.05	35	0.0	$4.83	$343.03	$20.00	66.82
Gym Storage 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$306.52	$10.00	122.67
Gym Storage 3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$306.52	$10.00	122.67
Gym Storage 4	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.05	35	0.0	$4.83	$343.03	$20.00	66.82

	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
Girl's Locker Room Office	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,663	0.03	106	0.0	$14.72	$188.46	$0.00	12.80
Girl's Locker Room	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Girl's Locker Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.05	266	0.0	$36.82	$343.03	$20.00	8.77
Girl's Locker Room	1	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	2,772	Relamp	Yes	1	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,940	0.04	183	0.0	$25.32	$378.69	$0.00	14.96
Girl's Locker Room RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Girl's Locker Room Int. Entry	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
Girl's Locker Room Int. Entry	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.03	133	0.0	$18.41	$306.52	$10.00	16.11
Girl's Locker Room Ext. Entry	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.03	133	0.0	$18.41	$306.52	$10.00	16.11
Girl's Locker Area	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.22	1,063	0.0	$147.27	$562.12	$115.00	3.04
Girl's Locker Area	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
Boy's Locker Room Int. Entry	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.03	133	0.0	$18.41	$306.52	$10.00	16.11
Boy's Locker Room Int. Entry	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
Boy's Locker Room Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.05	228	0.0	$31.56	$343.03	$20.00	10.24
Boy's Locker Room Office	1	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	2,376	Relamp	Yes	1	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,663	0.04	157	0.0	$21.70	$378.69	$0.00	17.45
Boy's Locker Room Office	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,663	0.03	106	0.0	$14.72	$342.46	$0.00	23.27
Boy's Locker Room Office RR	1	Exit Signs: LED - 2 W Lamp	None	6	364	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	364	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boy's Locker Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.22	1,063	0.0	$147.27	$1,102.12	$185.00	6.23
Boy's Locker Room	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boy's Locker Room Ext. Entry	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.03	133	0.0	$18.41	$306.52	$10.00	16.11
Gym RR Boy's	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.08	399	0.0	$55.22	$379.55	$65.00	5.70
Gym RR Girl's	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.08	399	0.0	$55.22	$379.55	$65.00	5.70
Music Room	9	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	120	2,772	Relamp	Yes	9	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,940	0.50	2,449	0.0	$339.09	$1,248.21	$35.00	3.58
Music Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.16	798	0.0	$110.45	$489.09	$95.00	3.57
Music Room	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,940	0.03	124	0.0	$17.17	$342.46	$0.00	19.94
Music Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	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
Music Room	3	Compact Fluorescent: PL (18W) - 1L	Wall Switch	18	2,772	Relamp	Yes	3	LED Screw-In Lamps: PL: LED (9W) - 1L	Occupancy Sensor	9	1,940	0.02	112	0.0	$15.49	$345.66	$0.00	22.31
Music Room Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Music Room Practice Room 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	520	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	364	0.05	50	0.0	$6.91	$189.03	$20.00	24.47
Music Room Practice Room 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	520	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	364	0.11	100	0.0	$13.81	$416.06	$75.00	24.69
Music Room Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Library / Media Center	50	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	50	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	1.37	6,647	0.0	$920.41	$3,175.75	$675.00	2.72
Library / Media Center	10	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	10	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,940	0.25	1,240	0.0	$171.72	$994.60	$35.00	5.59
Library / Media Center	9	U-Bend Fluorescent - T8: U T8 (32W) - 3L	Wall Switch	92	2,772	Relamp	Yes	9	LED - Linear Tubes: (3) U-Lamp	Occupancy Sensor	50	1,940	0.34	1,645	0.0	$227.85	$1,248.21	$35.00	5.32
Library / Media Center	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library / Media Center	6	Compact Fluorescent: PL (18W) - 1L	Wall Switch	18	2,772	Relamp	Yes	6	LED Screw-In Lamps: PL: LED (9W) - 1L	Occupancy Sensor	9	1,940	0.05	224	0.0	$30.99	$421.32	$0.00	13.60
Library / Media Center Office 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Library / Media Center Office 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Library / Media Center Office 2	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
CR 106	23	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	23	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.63	2,621	0.0	$362.90	$1,109.85	$265.00	2.33
CR 105	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
Girl's RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.05	266	0.0	$36.82	$343.03	$20.00	8.77
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Boy's RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.08	399	0.0	$55.22	$379.55	$65.00	5.70
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.03	133	0.0	$18.41	$152.52	$10.00	7.74
Faculty RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
CR 104	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.38	1,595	0.0	$220.90	$781.21	$175.00	2.74
CR 103	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR S12	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.49	2,051	0.0	$284.01	$927.27	$215.00	2.51
Cafeteria / MPR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.08	399	0.0	$55.22	$379.55	$65.00	5.70
Cafeteria / MPR	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

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Cafeteria / MPR	20	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Occupancy Sensor	114	2,772	Relamp	No	20	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,772	0.73	3,570	0.0	$494.42	$1,460.60	$400.00	2.15
Stage Lights	12	Incandescent: Screw-In (300W) - 1L	Wall Switch	300	800	Relamp	No	12	LED Screw-In Lamps: Screw-In: LED (45W) - 1L	Wall Switch	45	800	2.01	2,815	0.0	$389.85	$206.70	$60.00	0.38
Stage Stairs 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	800	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.02	30	0.0	$4.20	$36.52	$10.00	6.31
Stage Area	3	Compact Fluorescent: Screw-In (105W) - 1L	Wall Switch	105	800	Relamp	No	3	LED Screw-In Lamps: Screw-In: LED (30W) - 1L	Wall Switch	30	800	0.15	207	0.0	$28.67	$51.68	$15.00	1.28
Stage Area	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
Stage Stairs 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	800	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	800	0.04	61	0.0	$8.41	$73.03	$20.00	6.31
Backstage Elec. Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	365	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	256	0.16	105	0.0	$14.54	$335.09	$60.00	18.92
Ramp to MPR	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,940	0.16	798	0.0	$110.45	$419.09	$60.00	3.25
Cafeteria Side Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.03	133	0.0	$18.41	$152.52	$10.00	7.74
Kitchen	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.33	1,595	0.0	$220.90	$978.18	$190.00	3.57
Kitchen	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,940	0.03	124	0.0	$17.17	$342.46	$0.00	19.94
Kitchen	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
Kitchen Storage 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Kitchen Storage 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
CR 13	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 14	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
Girl's RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.11	532	0.0	$73.63	$416.06	$75.00	4.63
CR 15	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.25	1,025	0.0	$142.01	$598.64	$125.00	3.34
CR 15 Storage	1	Incandescent: Screw-In (60W) - 1L	Wall Switch	60	364	Relamp	Yes	1	LED Screw-In Lamps: Screw-In: (9W) - 1L	Occupancy Sensor	9	255	0.04	22	0.0	$3.11	$133.23	$5.00	41.19
CR 15 RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Boy's RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.08	399	0.0	$55.22	$379.55	$65.00	5.70
Storage Closet	1	Incandescent: Screw-In (60W) - 1L	Wall Switch	60	364	Relamp	Yes	1	LED Screw-In Lamps: Screw-In: (9W) - 1L	Occupancy Sensor	9	255	0.04	22	0.0	$3.11	$133.23	$5.00	41.19
Storage Closet	1	Incandescent: Screw-In (60W) - 1L	Wall Switch	60	364	Relamp	Yes	1	LED Screw-In Lamps: Screw-In: (9W) - 1L	Occupancy Sensor	9	255	0.04	22	0.0	$3.11	$133.23	$5.00	41.19
CR 10	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.22	912	0.0	$126.23	$562.12	$115.00	3.54

	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
CR 10	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,663	0.05	213	0.0	$29.44	$414.92	$0.00	14.09
CR S11	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 102	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.44	1,823	0.0	$252.45	$854.24	$195.00	2.61
CR 101	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.66	2,735	0.0	$378.68	$1,146.36	$275.00	2.30
CR 101	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
CR 110	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 109	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 108	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 107	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
Faculty Room	31	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	31	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.85	4,121	0.0	$570.65	$1,671.97	$380.00	2.26
Faculty Room	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Faculty Room RR 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Faculty Room RR 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Boy's RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.11	532	0.0	$73.63	$416.06	$75.00	4.63
Storage Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Girl's RR	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.11	532	0.0	$73.63	$416.06	$75.00	4.63
Room 113 (Technology)	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.57	2,792	0.0	$386.57	$1,036.82	$245.00	2.05
Room 113 (Technology)	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
CR 114	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 114	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
CR 114 Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
CR 115	24	LED - Fixtures: Ambient 2x4 Fixture	Wall Switch	40	2,376	None	Yes	24	LED - Fixtures: Ambient 2x4 Fixture	Occupancy Sensor	40	1,663	0.19	787	0.0	$108.97	$270.00	$35.00	2.16
CR 115	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
CR 115 Storage 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
CR 115 Storage 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.05	35	0.0	$4.83	$343.03	$20.00	66.82

	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
Art Room	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.98	4,786	0.0	$662.69	$1,854.54	$430.00	2.15
Art Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Art Room Storage 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.05	35	0.0	$4.83	$189.03	$20.00	34.96
Art Room Kiln Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,772	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,940	0.08	399	0.0	$55.22	$379.55	$65.00	5.70
Art Room Storage 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.05	35	0.0	$4.83	$343.03	$20.00	66.82
Nurse's Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Nurse's Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,376	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,663	0.25	1,025	0.0	$142.01	$598.64	$125.00	3.34
Nurse's Office	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
Nurse's Office RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Nurse's Office Exam Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,376	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,663	0.08	342	0.0	$47.34	$379.55	$65.00	6.65
Zone Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.11	456	0.0	$63.11	$416.06	$75.00	5.40
Zone Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,376	Relamp	Yes	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,663	0.04	171	0.0	$23.67	$324.77	$15.00	13.09
Zone Office	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
Zone Office Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,376	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,663	0.16	684	0.0	$94.67	$489.09	$95.00	4.16
Zone Office RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
2nd Floor Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
CR 208	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.44	1,823	0.0	$252.45	$854.24	$195.00	2.61
CR 207	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.44	1,823	0.0	$252.45	$854.24	$195.00	2.61
CR 206	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 205	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
Girl's RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.05	266	0.0	$36.82	$343.03	$20.00	8.77
Janitor Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Boy's RR	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.08	399	0.0	$55.22	$379.55	$65.00	5.70
Faculty RR 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Faculty RR 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96

	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
Server Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.16	798	0.0	$110.45	$489.09	$95.00	3.57
CR204	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.77	3,190	0.0	$441.80	$1,292.42	$315.00	2.21
CR S22	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.46	1,937	0.0	$268.23	$890.76	$205.00	2.56
CR S23	17	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	17	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.46	1,937	0.0	$268.23	$890.76	$205.00	2.56
CR S23 RR	1	Incandescent: Screw-In (60W) - 1L	Wall Switch	60	364	Relamp	Yes	1	LED Screw-In Lamps: Screw-In: (9W) - 1L	Occupancy Sensor	9	255	0.04	22	0.0	$3.11	$133.23	$5.00	41.19
Corridor RR	1	Incandescent: Screw-In (60W) - 1L	Wall Switch	60	364	Relamp	Yes	1	LED Screw-In Lamps: Screw-In: (9W) - 1L	Occupancy Sensor	9	255	0.04	22	0.0	$3.11	$133.23	$5.00	41.19
CR S24	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR S25	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR S26	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR S27	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.16	684	0.0	$94.67	$489.09	$95.00	4.16
Custodial Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
Boys RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.05	266	0.0	$36.82	$343.03	$20.00	8.77
Custodial Closet	1	Incandescent: Screw-In (60W) - 1L	Wall Switch	60	364	Relamp	Yes	1	LED Screw-In Lamps: Screw-In: (9W) - 1L	Occupancy Sensor	9	255	0.04	22	0.0	$3.11	$133.23	$5.00	41.19
Girls RR	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.05	266	0.0	$36.82	$343.03	$20.00	8.77
CR 20	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.44	1,823	0.0	$252.45	$854.24	$195.00	2.61
CR 21	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.33	1,367	0.0	$189.34	$708.18	$155.00	2.92
CR 203	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.82	3,418	0.0	$473.35	$1,635.45	$370.00	2.67
CR 203	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
CR 203 Prep Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.16	798	0.0	$110.45	$489.09	$95.00	3.57
CR 203 Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	255	0.03	17	0.0	$2.42	$152.52	$10.00	58.96
CR 202	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.82	3,418	0.0	$473.35	$1,365.45	$335.00	2.18
CR 202	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
CR 202 Prep Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.14	665	0.0	$92.04	$452.58	$85.00	3.99
CR 202	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
CR 202 Storage	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	364	None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	364	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
CR 201	30	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	30	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.82	3,418	0.0	$473.35	$1,635.45	$370.00	2.67
CR 201	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
Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,772	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,940	0.05	266	0.0	$36.82	$343.03	$20.00	8.77
CR 212	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 211	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 210	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
CR 209	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,663	0.57	2,393	0.0	$331.35	$1,036.82	$245.00	2.39
2nd Floor Hallway	40	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	40	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	1.09	7,047	0.0	$975.92	$2,260.60	$400.00	1.91
2nd Floor Hallway	9	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	9	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stairwell (Serene)	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	0.14	881	0.0	$121.99	$382.58	$50.00	2.73
Stairwell (Serene)	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,674	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,674	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stairwell (Serene)	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	2,572	0.03	164	0.0	$22.76	$272.46	$0.00	11.97
Stairwell (Serene)	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Office	6	Compact Fluorescent: PL (18W) - 2L	Wall Switch	36	2,376	Relamp	Yes	6	LED Screw-In Lamps: PL: LED (9W) - 2L	Occupancy Sensor	18	1,663	0.09	384	0.0	$53.12	$572.64	$35.00	10.12
Main Office Front Lobby	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Office Foyer	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,572	0.03	176	0.0	$24.40	$306.52	$10.00	12.15
Hallway: Main Office to Faculty Room	23	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	23	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,663	0.63	2,621	0.0	$362.90	$1,439.85	$230.00	3.33
Hallway: Main Office to Faculty Room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Library Hallway	5	Compact Fluorescent: PL (18W) - 2L	Wall Switch	36	3,674	Relamp	No	5	LED Screw-In Lamps: PL: LED (9W) - 2L	Wall Switch	18	3,674	0.06	380	0.0	$52.66	$252.20	$0.00	4.79
Stairwell to Library	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	0.14	881	0.0	$121.99	$382.58	$50.00	2.73
Stairwell to Library	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
Stairwell to Library	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,674	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,674	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stairwell to Library	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	2,572	0.03	164	0.0	$22.76	$272.46	$0.00	11.97
Hallway: Library to Boiler Room	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	0.44	2,819	0.0	$390.37	$984.24	$160.00	2.11
Hallway: Library to Boiler Room	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	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: Library to Boiler Room	13	Compact Fluorescent: PL (18W) - 2L	Wall Switch	36	3,674	Relamp	No	13	LED Screw-In Lamps: PL: LED (9W) - 2L	Wall Switch	18	3,674	0.15	989	0.0	$136.91	$655.72	$0.00	4.79
Woodshop Hallway	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	0.33	2,114	0.0	$292.78	$838.18	$120.00	2.45
Woodshop 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
Art Room Hallway	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	0.33	2,114	0.0	$292.78	$838.18	$120.00	2.45
Art Room 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
Hallway: CR 15 to Cafeteria	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	0.36	2,290	0.0	$317.18	$874.70	$130.00	2.35
Hallway: CR 15 to Cafeteria	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stairwell 3	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	0.11	705	0.0	$97.59	$346.06	$40.00	3.14
Stairwell 3	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
Stairwell 4	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,674	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,572	0.08	529	0.0	$73.19	$309.55	$30.00	3.82
Stairwell 4	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
Stairwell 4	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,674	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,674	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway: Cafeteria to Main Office	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,376	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,663	0.33	1,367	0.0	$189.34	$838.18	$120.00	3.79
Hallway: Cafeteria to Main Office	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
Front Entry	2	Compact Fluorescent: PL (18W) - 1L	Wall Switch	18	3,276	Relamp	Yes	2	LED Screw-In Lamps: PL: LED (9W) - 1L	Daylight Dimming	9	1,638	0.02	102	0.0	$14.09	$300.44	$0.00	21.33
Building Lights	6	Metal Halide: (1) 400W Lamp	Wall Switch	458	3,276	Fixture Replacement	Yes	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	120	1,638	1.57	8,997	0.0	$1,245.83	$7,295.79	$870.00	5.16
Door Lights	31	Compact Fluorescent: PL (18W) - 1L	Wall Switch	18	3,276	Relamp	Yes	31	LED Screw-In Lamps: PL: LED (9W) - 1L	Daylight Dimming	9	1,638	0.27	1,577	0.0	$218.33	$1,031.82	$1,395.00	-1.66
Door 11	4	Compact Fluorescent: PL (18W) - 2L	Wall Switch	36	3,276	Relamp	Yes	4	LED Screw-In Lamps: PL: LED (9W) - 2L	Daylight Dimming	18	1,638	0.07	407	0.0	$56.34	$451.76	$0.00	8.02
Door 8	4	Compact Fluorescent: PL (18W) - 2L	Wall Switch	36	3,276	Relamp	Yes	4	LED Screw-In Lamps: PL: LED (9W) - 2L	Daylight Dimming	18	1,638	0.07	407	0.0	$56.34	$451.76	$0.00	8.02
Parking Lot	4	High-Pressure Sodium: (1) 400W Lamp	Daylight Dimming	465	1,837	Fixture Replacement	No	4	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	120	1,837	0.90	2,915	0.0	$403.71	$3,722.26	$400.00	8.23

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Nurse's Office Packaged AC	1	Supply Fan	2.0	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Library Packaged AC	1	Supply Fan	3.0	87.5%	No	2,745	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Music Room Packaged AC	1	Supply Fan	2.0	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Cafeteria AHU	1	Supply Fan	7.5	89.5%	No	2,745	No	89.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Locker Rooms AHU	1	Supply Fan	5.0	87.5%	No	2,745	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Locker Rooms AHU	1	Exhaust Fan	2.0	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Main Office Packaged AC	1	Supply Fan	3.0	87.5%	No	2,745	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Main Office Packaged AC	1	Exhaust Fan	2.0	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridor Ceilings	Hallways	2	Supply Fan	3.0	87.5%	No	2,745	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Corridor Ceilings	Hallways	2	Return Fan	2.0	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Heating HW Supply	1	Heating Hot Water Pump	10.0	91.7%	No	2,745	No	91.7%	Yes	1	1.23	9,714	0.0	$1,345.19	$3,807.95	$0.00	2.83
Boiler Room	Heating HW Supply	1	Heating Hot Water Pump	10.0	91.7%	No	2,745	No	91.7%	Yes	1	1.23	9,714	0.0	$1,345.19	$3,807.95	$0.00	2.83
Elevator Machine Room	Hydrolic Elevator Pump Motor	1	Process Pump	25.0	93.6%	No	100	No	93.6%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Gym	2	Supply Fan	7.5	89.5%	No	3,391	Yes	91.7%	Yes	1	2.13	8,135	0.0	$1,126.52	$7,502.03	$1,200.00	5.59
Roof	Gym	2	Exhaust Fan	5.0	87.5%	No	2,745	No	87.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Ceilings	Classrooms, Faculty Room, Computer Lab	3	Supply Fan	0.3	73.4%	No	1,131	No	73.4%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Gymnasium	1	Packaged AC	10.00		Yes	1	Packaged AC	10.00		11.50		No	1.94	3,278	0.0	$453.97	$17,821.06	$730.00	37.65
Roof	Gymnasium	1	Packaged AC	10.00		Yes	1	Packaged AC	10.00		11.50		No	1.94	3,278	0.0	$453.97	$17,821.06	$730.00	37.65
Roof	Nurse's Office	1	Packaged AC	6.00		Yes	1	Packaged AC	6.00		11.50		No	1.17	1,967	0.0	$272.38	$10,692.63	$438.00	37.65
Roof	CR 113/114 & Faculty Room	2	Split-System AC	5.00		Yes	2	Split-System AC	5.00		14.00		No	3.19	5,386	0.0	$745.81	$14,962.20	$920.00	18.83
Roof	Library	1	Packaged AC	10.00		Yes	1	Packaged AC	10.00		11.50		No	1.94	3,278	0.0	$453.97	$17,821.06	$730.00	37.65
Roof	Music Room	1	Packaged AC	8.00		Yes	1	Packaged AC	8.00		11.50		No	1.55	2,623	0.0	$363.18	$14,256.85	$584.00	37.65
Roof	MDF Room	1	Ductless Mini-Split HP	1.00	12.80	Yes	1	Ductless Mini-Split HP	1.00	12.80	18.00	3.80	No	0.32	233	0.0	$32.23	$2,399.18	$92.00	71.58
Roof	Computer Lab	1	Split-System AC	5.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Main Office	1	Packaged AC	10.00		Yes	1	Packaged AC	10.00		11.50		No	1.94	3,278	0.0	$453.97	$17,821.06	$730.00	37.65
Building Windows	Individual Rooms	5	Window AC	1.00		Yes	1	Window AC	1.25		12.00		No	2.51	1,770	0.0	$245.11	$1,360.95	$0.00	5.55

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	Whole Building	1	Condensing Hot Water Boiler	1,850.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Whole Building	1	Condensing Hot Water Boiler	1,850.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Whole Building	1	Condensing Hot Water Boiler	1,850.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Whole Building	1	Condensing Hot Water Boiler	1,850.00	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

DHW Inventory & Recommendations

		Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Whole Building	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	2	Electric Steamer	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?
Whole Building	201	Desktop Computers	150.0	Yes
Whole Building	27	Desk Printers	40.0	Yes
Whole Building	4	Photocopiers	600.0	Yes
Whole Building	40	Projectors	150.0	Yes
Whole Building	16	Minifridge	153.0	Yes
Whole Building	11	Microwave Oven	900.0	Yes
Whole Building	4	Refrigerators	172.0	Yes
Whole Building	7	LCD TVs	71.0	Yes
Whole Building	2	Smartboards	50.0	Yes
Whole Building	4	Smartboards w/ Projector	200.0	Yes
Whole Building	58	Fans	100.0	No
Science Room	1	Aquarium (small)	25.0	No
Science Room	1	Aquarium (large)	25.0	No
Faculty Room	2	Coffee Maker	900.0	No
Whole Building	3	CRT TVs	120.0	No
Office	1	Laminator	500.0	No
Whole Building	2	Laptops	45.0	Yes
Computer Labs	2	Document Scanner	35.0	Yes
Office	2	Paper Shredder	150.0	Yes
Office	1	Water Cooler	500.0	Yes
Whole Building	25	Security Cameras	30.0	Yes
Whole Building	14	Water Fountain	127.0	No
Whole Building RR	28	Electric Hand Dryer	500.0	No
Woodshop	1	Tools	1,200.0	No
Kitchen	2	Double Door Refrigerators	218.0	Yes
Kitchen	1	Chest Refrigerator	156.0	Yes
Kitchen	1	Chest Freezer	127.0	Yes
Kitchen	1	Electric Warming Trays	600.0	No
Whole Building	300	Chromebooks	40.0	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 Room	1	Glass Fronted Refrigerated	Yes	0.00	1,209	0.0	$167.40	$230.00	$0.00	1.37
Faculty Room	1	Glass Fronted Refrigerated	Yes	0.00	1,209	0.0	$167.40	$230.00	$0.00	1.37

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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19

ENERGY STAR® Score[1]

Edgar School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 77,360
Built: 1916

For Year Ending: July 31, 2017
Date Generated: September 17, 2018

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Edgar School 49 Brunswick Avenue Metuchen, New Jersey 08840	Metuchen Board of Education 16 Simpson Place Metuchen, NJ 08840 (____)____-_____	Michael Harvier 16 Simpson Place Metuchen, NJ 08840 732-321-8700 ext. 1011 maharvier@metboe.k12.nj.us

Property ID: 6399369

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
93.2 kBtu/ft²

Source EUI
144.2 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	2,049,758 (28%)
Natural Gas (kBtu)	5,160,143 (72%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	67.3
National Median Source EUI (kBtu/ft²)	104.2
% Diff from National Median Source EUI	38%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	482

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)