Local Government Energy Audit:
Energy Audit Report

Memorial Elementary School

53 W Grand Ave

Montvale, New Jersey 07645

Montvale School District

September 28, 2018

Final Report by:

TRC Energy Services

Disclaimer

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

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

Estimated installation costs are based on TRC's experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from *RS Means*. The owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Since actual installed costs can vary widely for certain measures and conditions, TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

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

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1 EXECUTIVE SUMMARY

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

Memorial Elementary School is an 85,095 square foot single-story building comprised of various space types including classrooms, offices, a cafeteria, a library, a gymnasium and various mechanical and storage spaces.

Lighting at Memorial Elementary School consists of aging and inefficient linear and compact fluorescent lighting. Heating is supplied by two large steam boilers. Building cooling is provided by a mixture of split-system, packaged air conditioners and window air conditioners. Domestic hot water is provided by two natural gas fired storage water heaters. 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 nine measures, and recommends seven, which together represent an opportunity for Memorial Elementary School to reduce annual energy costs by roughly $29,252 and annual greenhouse gas emissions by 206,563 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 5.4 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 Memorial Elementary School's annual energy use by 10%.

Figure 1 – Previous 12 Month Utility Costs

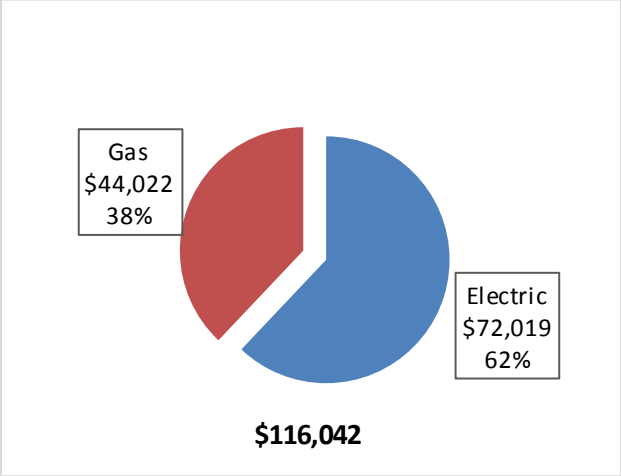
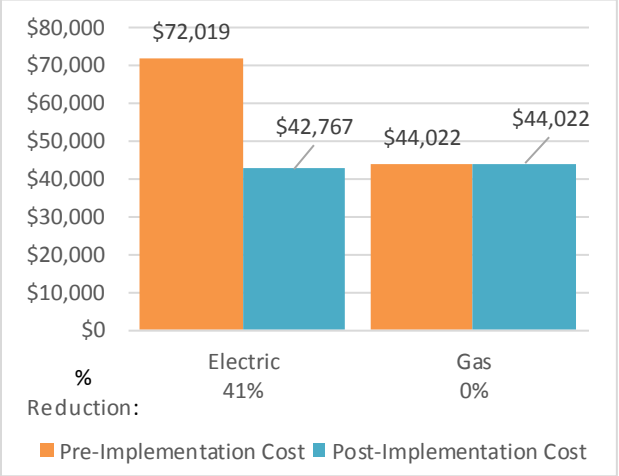


Figure 2 – Potential Post-Implementation Costs



A detailed description of Memorial Elementary 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			**153,678**	**32.1**	**0.0**	**$21,915.25**	**$121,769.61**	**$17,380.00**	**$104,389.61**	**4.8**	**154,753**
ECM 1	Install LED Fixtures	Yes	17,837	2.6	0.0	$2,543.71	$38,230.78	$4,550.00	$33,680.78	13.2	17,962
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	55,405	11.8	0.0	$7,900.96	$29,593.50	$3,515.00	$26,078.50	3.3	55,792
ECM 3	Retrofit Fixtures with LED Lamps	Yes	80,436	17.7	0.0	$11,470.59	$53,945.33	$9,315.00	$44,630.33	3.9	80,999
Lighting Control Measures			**32,379**	**7.0**	**0.0**	**$4,617.45**	**$41,792.00**	**$4,640.00**	**$37,152.00**	**8.0**	**32,606**
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	28,345	6.2	0.0	$4,042.20	$37,592.00	$4,640.00	$32,952.00	8.2	28,544
ECM 5	Install High/Low Lighitng Controls	Yes	4,034	0.8	0.0	$575.25	$4,200.00	$0.00	$4,200.00	7.3	4,062
Motor Upgrades			**1,051**	**0.3**	**0.0**	**$149.94**	**$5,645.09**	**$0.00**	**$5,645.09**	**37.6**	**1,059**
	Premium Efficiency Motors	No	1,051	0.3	0.0	$149.94	$5,645.09	$0.00	$5,645.09	37.6	1,059
Variable Frequency Drive (VFD) Measures			**19,072**	**3.6**	**0.0**	**$2,719.72**	**$19,030.22**	**$1,200.00**	**$17,830.22**	**6.6**	**19,205**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	Yes	6,029	2.0	0.0	$859.83	$7,213.60	$1,200.00	$6,013.60	7.0	6,072
ECM 7	Install VFDs on Hot Water Pumps	Yes	13,042	1.6	0.0	$1,859.89	$11,816.62	$0.00	$11,816.62	6.4	13,133
Gas Heating (HVAC/Process) Replacement			**0**	**0.0**	**36.2**	**$317.86**	**$11,328.67**	**$800.00**	**$10,528.67**	**33.1**	**4,243**
	Install High Efficiency Furnaces	No	0	0.0	36.2	$317.86	$11,328.67	$800.00	$10,528.67	33.1	4,243
TOTALS FOR HIGH PRIORITY MEASURES			**205,129**	**42.8**	**0.0**	**$29,252.42**	**$182,591.84**	**$23,220.00**	**$159,371.84**	**5.4**	**206,563**
TOTALS FOR ALL EVALUATED MEASURES			**206,181**	**43.1**	**36.2**	**$29,720.22**	**$199,565.59**	**$24,020.00**	**$175,545.59**	**5.9**	**211,865**

* - 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.

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

Energy Efficient Practices

TRC also identified 16 low cost (or no cost) energy efficient practices. A facility's energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at Memorial Elementary 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
- Check for and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Furnace Maintenance
- Perform Proper Water Heater Maintenance
- Perform Maintenance on Compressed Air Systems
- Install Plug Load Controls
- Replace Computer Monitors
- 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 Memorial Elementary School. Based on the configuration of the site and its loads there is a high potential for installing a photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	High	
System Potential	147	kW DC STC
Electric Generation	110,609	kWh/yr
Displaced Cost	$9,620	/yr
Installed Cost	$382,200	

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 that 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 or: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Andrea Wasserman	Business Administrator	awasserman@montvalek8.org	201-391-6226
Designated Representative			
Andrea Wasserman	Business Administrator	awasserman@montvalek8.org	201-391-6226
TRC Energy Services			
Alexander Klieverik	Auditor	aklieverik@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On April 24, 2018, TRC performed an energy audit at Memorial Elementary School located in Montvale, New Jersey. TRC's team met with Andrea Wasserman & Brian Marshall to review the facility operations and help focus our investigation on specific energy-using systems.

Memorial Elementary School is an 85,095 square foot single-story building comprised of various space types including classrooms, offices, a cafeteria, a library, a gymnasium and various mechanical and storage spaces.

The building was originally constructed in 1954 and additions were constructed approximately every 15 years. Over the last five years the facility has been in the process of converting existing T12 fluorescent fixtures to T8 fluorescent fixtures or retrofitting with LED lamps.

2.3 Building Occupancy

The building is open Monday through Friday and also on Saturdays. The typical schedule is presented in the table below. The entire facility is used most of the year, with limited use of the building for five weeks during the summer. During a typical day, the facility is occupied by approximately 80 faculty and 530 students.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Memorial Elementary School	Weekday	6:45 AM to 11:00 PM
Memorial Elementary School	Weekend	Saturdays 9:00 AM to 4:00 PM

2.4 Building Envelope

The building is constructed of concrete block and structural steel with a brick facade. The building has a flat roof covered with light-colored reflective membrane coating that is in good condition. The building has double pane windows which are in good condition and show little sign of excessive infiltration. The exterior doors are constructed of aluminum and in good condition.



2.5 On-Site Generation

Memorial Elementary School does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

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

Lighting System

Lighting is provided by a mixture of 32-Watt linear fluorescent T8 lamps with electronic ballasts as well as linear 40-Watt fluorescent T12 lamps with magnetic ballasts. Most of the classrooms have fixtures that are 2-lamp, 3-lamp, or 4-lamp, 4-foot long troffers with diffusers while some classrooms have indirect hanging fixtures with 2 or 3 lamps.



Some areas of the building including the library, cafeteria, stage area, and hallways contain some fixtures with LED lamps. The only area that underwent a comprehensive LED lighting replacement is the library.

Lighting control in most spaces is provided by wall switches. There are no occupancy sensors installed in the building.

The building's exterior lighting consists of high pressure sodium (HPS) and LED fixtures that are controlled by photocells. The baseball field is lit by 20 high intensity discharge (HID) fixtures with 1000-Watt lamps. The baseball field lighting is on the school's meter but maintained by the town of Montvale.




Steam & Hot Water Heating System

The heating system for this building consists of two H.B. Smith 2003 MBH output, natural draft steam boilers. The boilers have a nominal combustion efficiency of 79%. Because the building was constructed in sections, part of the building has steam distribution while the newer section has a heat exchanger and hot water distribution. The sections with steam distribution are the two classroom wings at the south of the building, and the offices, restrooms and cafeteria between them. The heat exchanger is located in the boiler room and produces 180°F water which is distributed by two 5 HP pumps and two additional 1.5 HP pumps. The pumps are configured in a constant flow primary distribution loop.




Steam and hot water are distributed to various rooftop units, unit ventilators, and unit heaters throughout the building. The gym hallway and atrium are heated by two rooftop air handlers with hot water coils, each with one 1.5 HP supply fan. The teacher's lounge, nurse's office, and room 163 are served by three Carrier packaged rooftop units with hot water coils and direct expansion cooling. Each packaged unit has a 1.5 HP supply fan and a ½ HP return fan.



Unit ventilators throughout the building operate on a schedule timer from 7:00 AM to 5:00 PM.

The boilers operate in a lead/lag configuration. Both boilers may be required during cold weather. The boilers are in fair condition but well maintained.

The gymnasium is heated by two Trane heating-only rooftop units with natural gas furnaces with heating capacities of 250 MBH each. Each unit has a 7.5 HP supply fan.


Direct Expansion Air Conditioning System (DX)

Cooling for the building is provided by a mixture of split-system, packaged air conditioners, and window air conditioners. The three Carrier packaged rooftop units serving the teacher's lounge, nurse's office, and room 163 each have a capacity of 4 tons. The art room, music room, and classrooms 171, 172, 173, 174, 175, 176, are served by 8 split-system air conditioners, each with a capacity of 3.5 tons. The units utilize a scroll compressor and a direct-expansion (DX) coil. The gymnasium office, copier room, and classroom 124 are cooled via three Airedale ductless mini-split air conditioners with a capacity of 1 ton each.




The tech room and library are conditioned by ductless mini-split heat pumps. The tech room is served by a Fujitsu model AOU15RLQ unit with a cooling capacity of 1.25 tons and a heating capacity of 18 kBtuh. This is a high-efficiency unit with a SEER of 20 and a COP 3.7. The library is conditioned by two Fujitsu model AOU42RLX units with a cooling capacity of 3.5 tons and a heating capacity of 45 kBtuh.

The units are controlled by individual thermostats located in the space. The heat pumps operate continuously to maintain the space temperature setpoint around 72°F.

Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of two gas fired water heaters, each with an input rating of 199 kBtu each and a nominal efficiency of 80%. Each water heater has a 100 gallon storage tank. Two fractional HP recirculation pumps distribute 120°F water to the entire site. The recirculation pumps operate continuously.

Building Plug Load

There are about 105 computer work stations throughout the facility. Roughly 90% of the computers are desktop units with LCD monitors. There is no centralized PC power management software installed.

Other equipment contributing to the building's plug load is 31 projectors, 30 smartboards, four photocopiers, 18 desk printers, five LCD televisions, and five refrigerators.

2.7 Water-Using Systems

There are 25 restrooms at this facility. A sampling of restrooms found that the faucets are rated for 2.2 gallons per minute (gpm) or lower, the toilets are rated at 2.5 gallons per flush (gpf) and the urinals are rated at 2 gpf.

3 Site Energy Use and Costs

Utility data for electricity and natural gas was analyzed to identify opportunities for savings. In addition, data for electricity and natural gas was evaluated to determine the annual energy performance metrics for the building in energy cost per square foot and energy usage per square foot. These metrics are an estimate of the relative energy efficiency of this building. There are a number of factors that could cause the energy use of this building to vary from the "typical" energy usage profile for facilities with similar characteristics. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and energy efficient behavior of occupants all contribute to benchmarking scores. Please refer to the Benchmarking section within Section 3.3 for additional information.

3.1 Total Cost of Energy

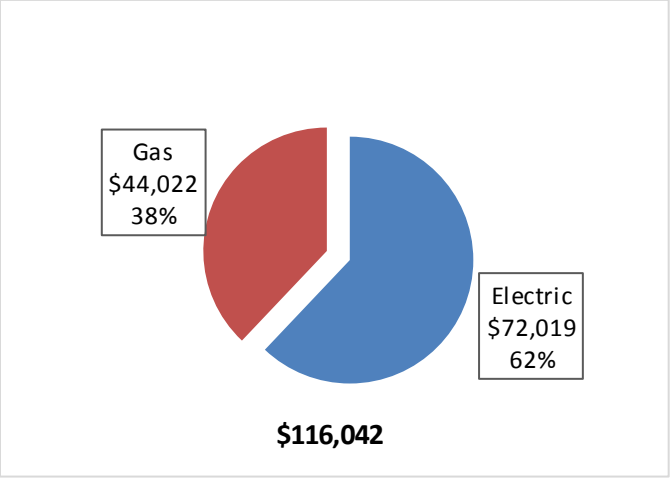
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Memorial Elementary School		
Fuel	**Usage**	**Cost**
Electricity	505,027 kWh	$72,019
Natural Gas	50,186 Therms	$44,022
Total		**$116,042**

The current annual energy cost for this facility is $116,042 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by Rockland Electric. The average electric cost over the past 12 months was $0.143/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. Reduced electricity usage in the summer is consistent with reduced operations despite the increased cooling demand.

Figure 9 - Electric Usage & Demand

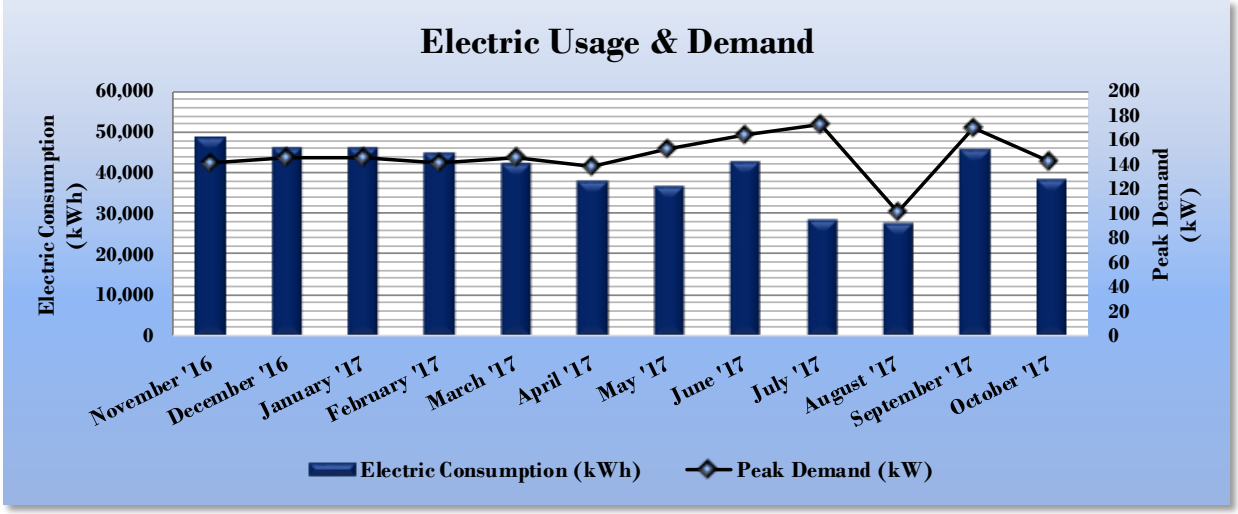


Figure 10 - Electric Usage & Demand

Electric Billing Data for Memorial Elementary School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
11/30/16	32	48,800	141	$495	$6,722
12/30/16	29	46,240	146	$256	$6,402
1/31/17	31	46,240	146	$256	$6,402
3/1/17	28	44,800	141	$493	$6,197
3/29/17	27	42,400	146	$488	$5,959
4/28/17	29	37,920	139	$466	$5,364
5/26/17	27	36,960	154	$515	$5,290
6/28/17	32	42,720	165	$639	$6,180
7/28/17	29	28,800	173	$686	$4,442
8/28/17	30	27,680	101	$396	$4,039
9/28/17	30	46,080	170	$673	$6,707
10/27/17	28	38,400	142	$165	$5,750
Totals	**352**	**487,040**	**172.8**	**$5,530**	**$69,454**
Annual	**365**	**505,027**	**172.8**	**$5,734**	**$72,019**

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is $0.877/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below. Usage is consistent with a winter heating profile.

Figure 11 - Natural Gas Usage

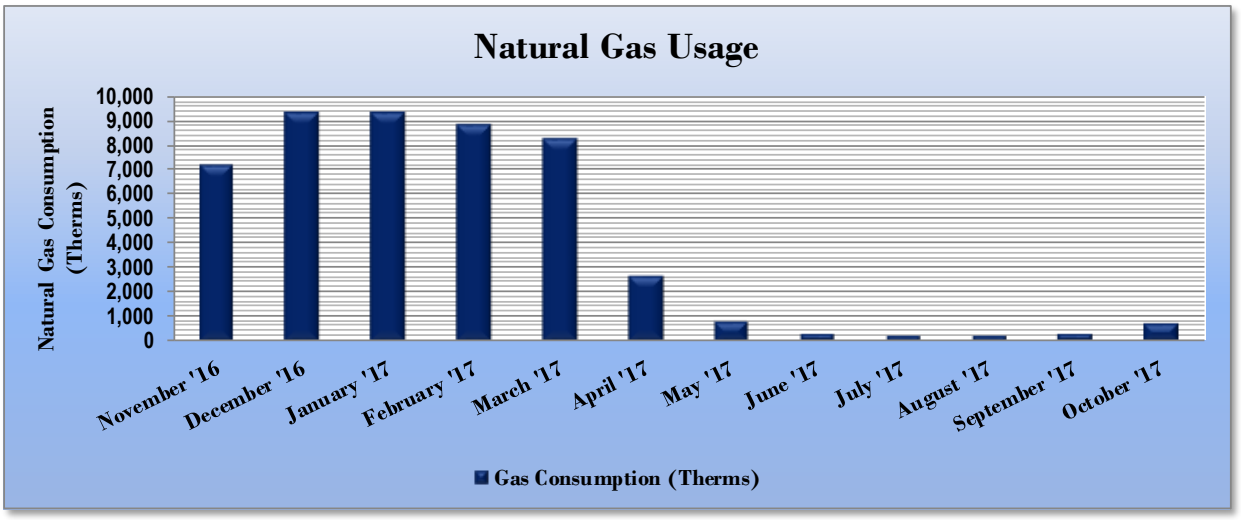


Figure 12 - Natural Gas Usage

Gas Billing Data for Memorial Elementary School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
11/30/16	32	7,224	$6,239
12/30/16	29	9,377	$8,314
1/31/17	31	9,337	$9,277
3/1/17	28	8,835	$8,260
3/29/17	27	8,278	$6,569
4/28/17	29	2,690	$1,649
5/26/17	27	795	$564
6/28/17	32	300	$283
7/28/17	29	236	$241
8/28/17	30	246	$244
9/28/17	30	325	$288
10/27/17	28	755	$526
Totals	**352**	**48,399**	**$42,454**
Annual	**365**	**50,186**	**$44,022**

3.3 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		
	Memorial Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	125.5	141.4
Site Energy Use Intensity (kBtu/ft^2)	79.2	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		
	Memorial Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	99.7	141.4
Site Energy Use Intensity (kBtu/ft^2)	71.0	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 53.

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

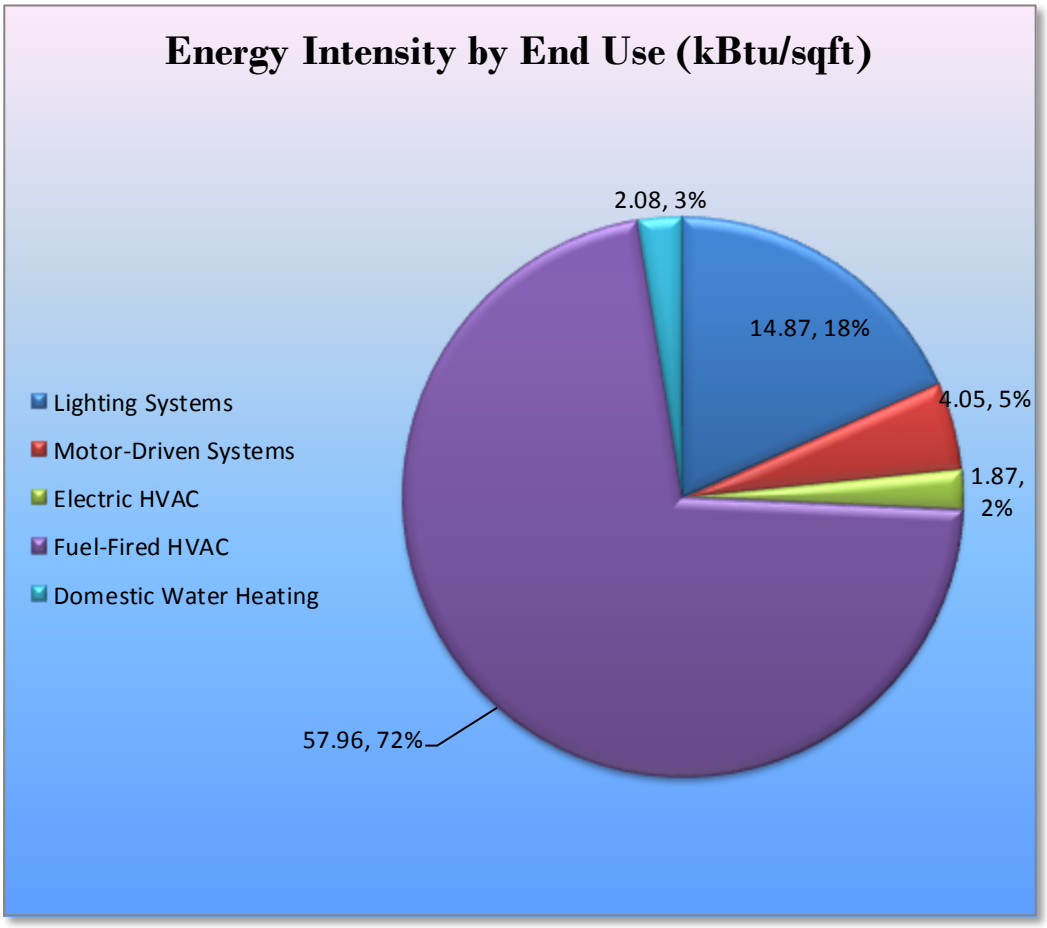
For more information on ENERGY STAR® certification go to: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

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.

3.4 Energy End-Use Breakdown

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

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



4 ENERGY CONSERVATION MEASURES

Level of Analysis

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Memorial Elementary 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		**153,678**	**32.1**	**0.0**	**$21,915.25**	**$121,769.61**	**$17,380.00**	**$104,389.61**	**4.8**	**154,753**
ECM 1	Install LED Fixtures	17,837	2.6	0.0	$2,543.71	$38,230.78	$4,550.00	$33,680.78	13.2	17,962
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	55,405	11.8	0.0	$7,900.96	$29,593.50	$3,515.00	$26,078.50	3.3	55,792
ECM 3	Retrofit Fixtures with LED Lamps	80,436	17.7	0.0	$11,470.59	$53,945.33	$9,315.00	$44,630.33	3.9	80,999
Lighting Control Measures		**32,379**	**7.0**	**0.0**	**$4,617.45**	**$41,792.00**	**$4,640.00**	**$37,152.00**	**8.0**	**32,606**
ECM 4	Install Occupancy Sensor Lighting Controls	28,345	6.2	0.0	$4,042.20	$37,592.00	$4,640.00	$32,952.00	8.2	28,544
ECM 5	Install High/Low Lighitng Controls	4,034	0.8	0.0	$575.25	$4,200.00	$0.00	$4,200.00	7.3	4,062
Variable Frequency Drive (VFD) Measures		**19,072**	**3.6**	**0.0**	**$2,719.72**	**$19,030.22**	**$1,200.00**	**$17,830.22**	**6.6**	**19,205**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	6,029	2.0	0.0	$859.83	$7,213.60	$1,200.00	$6,013.60	7.0	6,072
ECM 7	Install VFDs on Hot Water Pumps	13,042	1.6	0.0	$1,859.89	$11,816.62	$0.00	$11,816.62	6.4	13,133
TOTALS		**205,129**	**42.8**	**0.0**	**$29,252.42**	**$182,591.84**	**$23,220.00**	**$159,371.84**	**5.4**	**206,563**

* - 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		**153,678**	**32.1**	**0.0**	**$21,915.25**	**$121,769.61**	**$17,380.00**	**$104,389.61**	**4.8**	**154,753**
ECM 1	Install LED Fixtures	17,837	2.6	0.0	$2,543.71	$38,230.78	$4,550.00	$33,680.78	13.2	17,962
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	55,405	11.8	0.0	$7,900.96	$29,593.50	$3,515.00	$26,078.50	3.3	55,792
ECM 3	Retrofit Fixtures with LED Lamps	80,436	17.7	0.0	$11,470.59	$53,945.33	$9,315.00	$44,630.33	3.9	80,999

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	3,231	0.7	0.0	$460.76	$24,166.80	$1,350.00	$22,816.80	49.5	3,254
Exterior	14,606	1.9	0.0	$2,082.95	$14,063.98	$3,200.00	$10,863.98	5.2	14,709

Measure Description

We recommend replacing selected fixtures containing high pressure sodium (HPS) 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. Interior fixtures located in the cafeteria are recommended for replace; consider selecting fixtures equipped with on-board occupancy sensor based switching controls. Exterior fixtures, including those located on the building perimeter and at entrances are recommended for replacement.

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

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	55,405	11.8	0.0	$7,900.96	$29,593.50	$3,515.00	$26,078.50	3.3	55,792
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

We recommend retrofitting existing fluorescent fixtures by removing fluorescent tubes and ballasts and replacing them with LEDs and LED drivers (if necessary), which are designed to be used retrofitted fluorescent fixtures. The measure uses the existing fixture housing but replaces the rest of the components with more efficient lighting technology. This measure primarily pertains to cases with existing T12 lamps which generally cannot accept LED tubes without a ballast configuration adjustment. 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 tube and more than 10 times longer than many incandescent lamps.

ECM 3: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Interior	79,989	17.7	0.0	$11,406.88	$53,837.83	$9,305.00	$44,532.83	3.9	80,549
Exterior	447	0.1	0.0	$63.71	$107.51	$10.00	$97.51	1.5	450

Measure Description

We recommend retrofitting existing incandescent, linear fluorescent, and compact fluorescent fixtures 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 tube and more than 10 times longer than many incandescent lamps.

4.1.2 Lighting Control Measures

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

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**32,379**	**7.0**	**0.0**	**$4,617.45**	**$41,792.00**	**$4,640.00**	**$37,152.00**	**8.0**	**32,606**
ECM 4	Install Occupancy Sensor Lighting Controls	28,345	6.2	0.0	$4,042.20	$37,592.00	$4,640.00	$32,952.00	8.2	28,544
ECM 5	Install High/Low Lighitng Controls	4,034	0.8	0.0	$575.25	$4,200.00	$0.00	$4,200.00	7.3	4,062

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 4: 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)
28,345	6.2	0.0	$4,042.20	$37,592.00	$4,640.00	$32,952.00	8.2	28,544

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in most restrooms, classrooms, and offices, as well as in the library, cafeteria and gymnasium. 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 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)
4,034	0.8	0.0	$575.25	$4,200.00	$0.00	$4,200.00	7.3	4,062

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. We recommend such lighting controls in 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 Variable Frequency Drive Measures

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

Figure 19 – Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**19,072**	**3.6**	**0.0**	**$2,719.72**	**$19,030.22**	**$1,200.00**	**$17,830.22**	**6.6**	**19,205**
ECM 6	Install VFDs on Constant Volume (CV) HVAC	6,029	2.0	0.0	$859.83	$7,213.60	$1,200.00	$6,013.60	7.0	6,072
ECM 7	Install VFDs on Hot Water Pumps	13,042	1.6	0.0	$1,859.89	$11,816.62	$0.00	$11,816.62	6.4	13,133

ECM 6: 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)
6,029	2.0	0.0	$859.83	$7,213.60	$1,200.00	$6,013.60	7.0	6,072

Measure Description

We recommend installing variable frequency drives (VFDs) to control the gymnasium supply fan motor speeds to convert a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor, if the air handler has one. Zone thermostats will cause the VFD to modulate fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature. Energy savings results from reducing fan speed (and power) when there is a reduced load required for the zone. The magnitude of energy savings is based on the estimated amount of time that fan motors operate at partial load. Prior to implementing the VFD measure, compatibility with the existing motors should be verified and the motors replaced if they are not invert duty rated.

ECM 7: 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)
13,042	1.6	0.0	$1,859.89	$11,816.62	$0.00	$11,816.62	6.4	13,133

Measure Description

We recommend installing a variable frequency drives (VFD) to control the two 5.0 HP and the two 1.5 HP hot water pumps. This measure requires that a majority of the hot water coils be served by 2-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. Prior to implementing the VFD measure, compatibility with the existing motors should be verified and the motors replaced if they are not invert duty rated.

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 20 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)*	Estimated Net Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Motor Upgrades	**1,051**	**0.3**	**0.0**	**$149.94**	**$5,645.09**	**$0.00**	**$5,645.09**	**37.6**	**1,059**
Premium Efficiency Motors	1,051	0.3	0.0	$149.94	$5,645.09	$0.00	$5,645.09	37.6	1,059
Gas Heating (HVAC/Process) Replacement	**0**	**0.0**	**36.2**	**$317.86**	**$11,328.67**	**$800.00**	**$10,528.67**	**33.1**	**4,243**
Install High Efficiency Furnaces	0	0.0	36.2	$317.86	$11,328.67	$800.00	$10,528.67	33.1	4,243
TOTALS	**1,051**	**0.3**	**36.2**	**$467.80**	**$16,973.75**	**$800.00**	**$16,173.75**	**34.6**	**5,302**

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

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

Premium Efficiency Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,051	0.3	0.0	$149.94	$5,645.09	$0.00	$5,645.09	37.6	1,059

Measure Description

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

Reasons for not Recommending

Due to the long payback period, we do not recommend motor replacement on the basis of energy savings at this time.

Install High Efficiency Furnaces

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	36.2	$317.86	$11,328.67	$800.00	$10,528.67	33.1	4,243

Measure Description

We typically recommend replacing existing standard efficiency furnaces with condensing furnaces when cost effective. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases which can significantly improve furnace efficiency. Savings result from improved system efficiency. It should be noted that the furnace is part of a packaged rooftop unit. Montvale school district should consider replacement of the entire unit when upgrading these units.

Reasons for not Recommending

Due to the long payback period, we do not recommend installing high efficiency furnaces at this time.

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.

Check for and Seal Duct Leakage

Duct leakage in commercial buildings typically accounts for 5% to 25% of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building, significantly increasing cooling and heating costs. By sealing sources of leakage, cooling, heating, and ventilation energy use can be reduced significantly, depending on the severity of air leakage.

Perform Proper Boiler Maintenance

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

Perform Proper Furnace Maintenance

Preventative furnace maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should include tasks such as checking for gas / carbon monoxide leaks; changing the air and fuel filters; checking components for cracks, corrosion, dirt, or debris build-up; ensuring the ignition system is working properly; testing and adjusting operation and safety controls; inspecting the electrical connections; and ensuring proper lubrication for motors and bearings.

Perform Proper Water Heater Maintenance

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

Perform Maintenance on Compressed Air Systems

Like all electro-mechanical equipment, compressed air systems require periodic maintenance to operate at peak efficiency. A maintenance plan should be developed for process related compressed air systems to include inspection, cleaning, and replacement of inlet filter cartridges, cleaning of drain traps, daily inspection of lubricant levels to reduce unwanted friction, inspection of belt condition and tension, checking for system leaks and adjustment of loose connections, and overall system cleaning. Contact a qualified technician for help with setting up periodic maintenance schedule.

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.

Replace Computer Monitors

Replacing old computer monitors or displays with efficient monitors will reduce energy use. ENERGY STAR® rated monitors have specific requirements for on mode power consumption as well as idle and sleep mode power. According to the ENERGY STAR® website monitors that have earned the ENERGY STAR® label are 25% more efficient than standard monitors.

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.

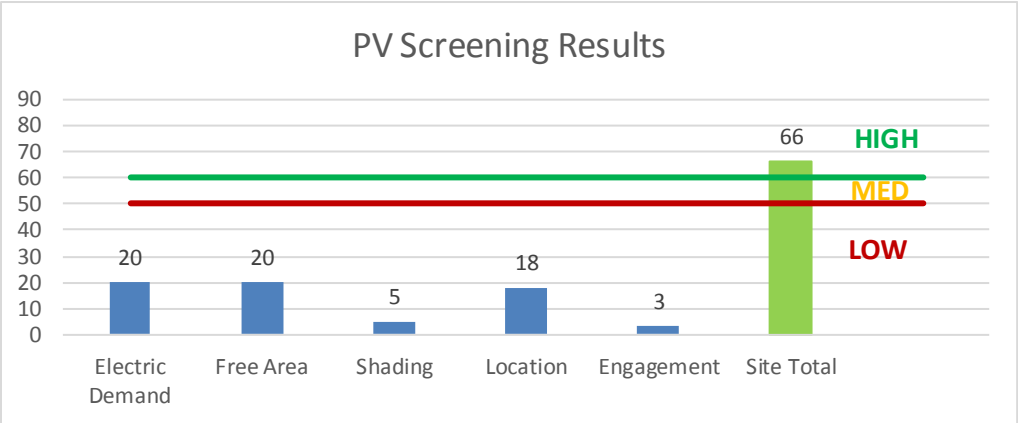
6.1 Photovoltaic

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

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

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high potential for PV at the site. A PV array located on the roof of the building may be feasible. If Memorial Elementary School is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 21 - Photovoltaic Screening



Solar projects must register their projects in the SREC (Solar Renewable Energy Certificate) Registration Program 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.

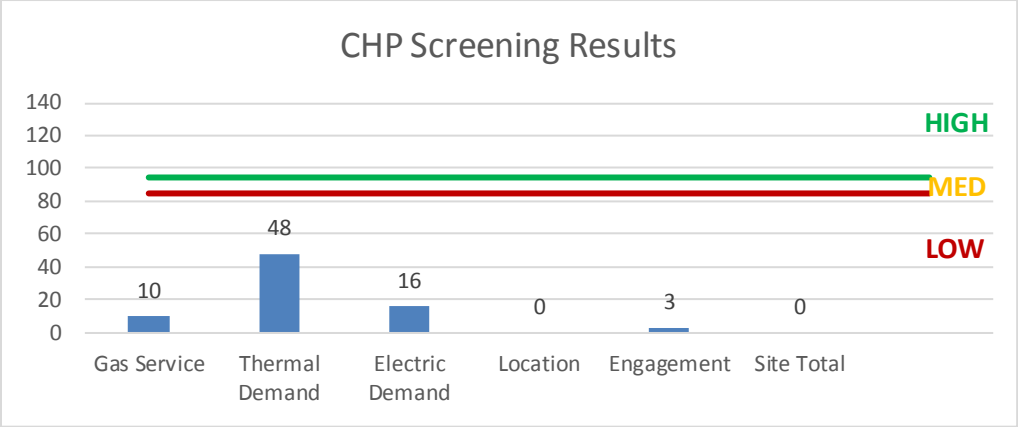
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste 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 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 22 - 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 our opinion 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 23 for a list of the eligible programs identified for each recommended ECM.

Figure 23 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	X		X			
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	X		X			
ECM 3	Retrofit Fixtures with LED Lamps	X		X			
ECM 4	Install Occupancy Sensor Lighting Controls	X		X			
ECM 5	Install High/Low Lighitng Controls			X			
ECM 6	Install VFDs on Constant Volume (CV) HVAC	X					
ECM 7	Install VFDs on Hot Water Pumps			X			

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

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

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

8.1 SmartStart

Overview

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

Equipment with Prescriptive Incentives Currently Available:

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

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

Incentives

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

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

How to Participate

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

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

8.2 Direct Install

Overview

Direct Install is a turnkey program available to existing small to medium-sized facilities with a peak electric demand that does not exceed 200 kW for any recent 12-month period. You will 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. Direct Install participants will also be held to a fiscal year cap of $250,000 per entity.

How to Participate

To participate in the Direct Install program, you will need to contact the participating contractor who 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.

Since Direct Install offers a free assessment of eligible measures, Direct Install is also available to small businesses and other commercial facilities too that may not be eligible for the more detailed facility audits provided by LGEA.

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. SREC's are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

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

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

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

8.4 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 descriptions and application can be found at: www.njcleanenergy.com/ESIP.

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

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	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
Boiler Room	4	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,728	Relamp & Reballast	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.18	850	0.0	$121.15	$738.00	$75.00	5.47
Boiler Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.08	392	0.0	$55.97	$445.50	$65.00	6.80
Basement Storage	3	LED Screw-In Lamps: Screw-In LED: (10W) - 1L	Wall Switch	10	1,364	None	Yes	3	LED Screw-In Lamps: Screw-In LED: (10W) - 1L	Occupancy Sensor	10	955	0.01	14	0.0	$2.01	$0.00	$0.00	0.00
Basement Storage	2	Incandescent: Screw-In: (60W) - 1L	Wall Switch	60	1,364	Relamp	Yes	2	LED Screw-In Lamps: Screw-In LED: (9W) - 1L	Occupancy Sensor	9	955	0.07	168	0.0	$24.02	$107.51	$10.00	4.06
Basement Storage	5	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,364	Relamp & Reballast	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	955	0.22	531	0.0	$75.72	$855.00	$50.00	10.63
Basement Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	955	0.03	65	0.0	$9.33	$58.50	$10.00	5.20
Basement Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	1,364	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	955	0.10	230	0.0	$32.84	$460.27	$40.00	12.80
Maintenance Room	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.36	1,701	0.0	$242.52	$1,030.50	$165.00	3.57
Maintenance 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
Pump Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.08	95	0.0	$13.54	$445.50	$65.00	28.10
Server Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.10	461	0.0	$65.68	$460.27	$75.00	5.87
Copy Room (164)	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,728	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,910	0.21	981	0.0	$139.92	$646.00	$110.00	3.83
CR 172	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 172	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.87	4,186	0.0	$596.98	$2,412.00	$390.00	3.39
CR 172 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.03	32	0.0	$4.51	$174.50	$10.00	36.45
CR 172 Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	Yes	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	462	0.01	14	0.0	$2.01	$116.00	$0.00	57.62
CR 174	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 174	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.87	4,186	0.0	$596.98	$2,412.00	$390.00	3.39
CR 174 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.03	131	0.0	$18.66	$174.50	$10.00	8.82
CR 174 Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	Yes	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	462	0.01	14	0.0	$2.01	$116.00	$0.00	57.62
CR 176	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 176	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.87	4,186	0.0	$596.98	$2,412.00	$390.00	3.39
CR 176 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.03	131	0.0	$18.66	$174.50	$10.00	8.82
CR 176 Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	Yes	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	462	0.01	14	0.0	$2.01	$116.00	$0.00	57.62

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
CR 175	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 175	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.87	4,186	0.0	$596.98	$2,412.00	$390.00	3.39
CR 175 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.03	131	0.0	$18.66	$174.50	$10.00	8.82
CR 175 Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	Yes	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	462	0.01	14	0.0	$2.01	$116.00	$0.00	57.62
CR 173	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 173	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.87	4,186	0.0	$596.98	$2,412.00	$390.00	3.39
CR 173 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.03	131	0.0	$18.66	$174.50	$10.00	8.82
CR 173 Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	Yes	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	462	0.01	14	0.0	$2.01	$116.00	$0.00	57.62
CR 171	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 171	32	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	32	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.87	4,186	0.0	$596.98	$2,412.00	$390.00	3.39
CR 171 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.03	32	0.0	$4.51	$174.50	$10.00	36.45
CR 171 Storage Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	Yes	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	462	0.01	14	0.0	$2.01	$116.00	$0.00	57.62
Nurse's Suite (169)	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.25	1,177	0.0	$167.90	$796.50	$125.00	4.00
Nurse's Suite (169)	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,910	0.03	122	0.0	$17.40	$63.20	$0.00	3.63
Nurse's Office (169)	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,728	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,910	0.12	589	0.0	$83.95	$495.60	$80.00	4.95
Nurse's Restroom (169)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	1,364	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	955	0.03	65	0.0	$9.33	$174.50	$10.00	17.64
Custodial Room (168)	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	Yes	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	462	0.01	14	0.0	$2.01	$116.00	$0.00	57.62
Teachers Work Room	16	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,728	Relamp	Yes	16	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,910	0.66	3,140	0.0	$447.74	$1,473.20	$275.00	2.68
Teachers Work Room RR	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.03	32	0.0	$4.51	$174.50	$10.00	36.45
Electrical Room (166)	2	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	660	None	No	2	Linear Fluorescent - T8: 2' T8 (17W) - 1L	Wall Switch	22	660	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Work Room (122)	11	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,728	Relamp & Reballast	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.49	2,336	0.0	$333.16	$1,557.00	$145.00	4.24
Work Room (122)	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.11	523	0.0	$74.62	$504.00	$75.00	5.75
Office (131)	6	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	6	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,910	0.15	732	0.0	$104.42	$649.20	$35.00	5.88
CR 124	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.44	2,124	0.0	$302.88	$1,079.17	$135.00	3.12
CR 124	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$650.53	$115.00	4.08

	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 126	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.53	2,549	0.0	$363.45	$1,241.00	$155.00	2.99
CR 126	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.14	691	0.0	$98.51	$285.40	$60.00	2.29
CR 128	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.53	2,549	0.0	$363.45	$1,241.00	$155.00	2.99
CR 128	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.14	691	0.0	$98.51	$285.40	$60.00	2.29
CR 130	7	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.62	2,973	0.0	$424.03	$1,402.83	$175.00	2.90
CR 130	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.10	461	0.0	$65.68	$190.27	$40.00	2.29
CR 129	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.53	2,549	0.0	$363.45	$1,241.00	$155.00	2.99
CR 129	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.14	691	0.0	$98.51	$285.40	$60.00	2.29
CR 127	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.53	2,549	0.0	$363.45	$1,241.00	$155.00	2.99
CR 127	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.14	691	0.0	$98.51	$285.40	$60.00	2.29
CR 125	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.53	2,549	0.0	$363.45	$1,241.00	$155.00	2.99
CR 125	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.14	691	0.0	$98.51	$285.40	$60.00	2.29
CR 123	7	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.62	2,973	0.0	$424.03	$1,402.83	$175.00	2.90
CR 123	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.10	461	0.0	$65.68	$190.27	$40.00	2.29
Boys Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.08	392	0.0	$55.97	$445.50	$65.00	6.80
Boys Handicap Restroom	1	Incandescent: Screw-In: (60W) - 1L	Wall Switch	60	660	Relamp	Yes	1	LED Screw-In Lamps: Screw-In LED: (9W) - 1L	Occupancy Sensor	9	462	0.04	41	0.0	$5.81	$169.75	$5.00	28.35
Girls Restroom	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.08	392	0.0	$55.97	$445.50	$65.00	6.80
Room 119	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,728	Relamp	Yes	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,910	0.25	1,177	0.0	$167.90	$721.20	$125.00	3.55
Room 119 Restroom	1	Incandescent: Screw-In: (60W) - 1L	Wall Switch	60	660	Relamp	Yes	1	LED Screw-In Lamps: Screw-In LED: (9W) - 1L	Occupancy Sensor	9	462	0.04	41	0.0	$5.81	$169.75	$5.00	28.35
Womens Restroom	1	Incandescent: Screw-In: (60W) - 1L	Wall Switch	60	660	Relamp	Yes	1	LED Screw-In Lamps: Screw-In LED: (9W) - 1L	Occupancy Sensor	9	462	0.04	41	0.0	$5.81	$169.75	$5.00	28.35
Guidance Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,728	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,910	0.12	589	0.0	$83.95	$495.60	$80.00	4.95
Guidance Office Storage 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.05	63	0.0	$9.03	$233.00	$20.00	23.60
Guidance Office Storage 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.05	63	0.0	$9.03	$233.00	$20.00	23.60
CR 121	7	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.62	2,973	0.0	$424.03	$1,402.83	$175.00	2.90
CR 121	7	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	7	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.34	1,612	0.0	$229.86	$665.93	$140.00	2.29

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 119C	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,728	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.09	425	0.0	$60.58	$234.00	$20.00	3.53
Room 119C	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.05	262	0.0	$37.31	$387.00	$55.00	8.90
Room 119C Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	Yes	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	462	0.01	14	0.0	$2.01	$116.00	$0.00	57.62
Room 119C Office	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	4	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,910	0.10	488	0.0	$69.61	$522.80	$35.00	7.01
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.05	63	0.0	$9.03	$233.00	$20.00	23.60
CR 120	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.14	691	0.0	$98.51	$555.40	$95.00	4.67
CR 118	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.14	691	0.0	$98.51	$555.40	$95.00	4.67
CR 116	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	2,728	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.09	425	0.0	$60.58	$504.00	$55.00	7.41
CR 116	2	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.18	850	0.0	$121.15	$323.67	$40.00	2.34
CR 116	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.05	230	0.0	$32.84	$95.13	$20.00	2.29
Library	30	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,728	None	Yes	30	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.34	1,638	0.0	$233.53	$540.00	$70.00	2.01
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
Library Office	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,728	None	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.02	109	0.0	$15.57	$116.00	$0.00	7.45
Library Storage	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	660	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	462	0.03	40	0.0	$5.65	$116.00	$0.00	20.53
Boys Restroom 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,728	0.02	104	0.0	$14.76	$58.50	$10.00	3.29
Girls Restroom 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,728	0.02	104	0.0	$14.76	$58.50	$10.00	3.29
CR 117	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.29	1,382	0.0	$197.03	$840.80	$155.00	3.48
Custodial Closet	1	Incandescent: Screw-In: (60W) - 1L	Wall Switch	60	660	Relamp	No	1	LED Screw-In Lamps: Screw-In LED: (9W) - 1L	Wall Switch	9	660	0.03	39	0.0	$5.52	$53.75	$5.00	8.83
Kitchen	4	Linear Fluorescent - T12: 4' T12 (40W) - 3L	Wall Switch	127	1,150	Relamp & Reballast	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	805	0.25	511	0.0	$72.84	$796.00	$95.00	9.62
Kitchen	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	1,150	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	805	0.12	248	0.0	$35.39	$225.60	$45.00	5.10
Cafetorium	3	LED - Fixtures: High-Bay	Wall Switch	45	2,728	None	Yes	3	LED - Fixtures: High-Bay	Occupancy Sensor	45	1,910	0.03	127	0.0	$18.12	$660.00	$105.00	30.63
Cafetorium	9	High-Pressure Sodium: (1) 150W Lamp	Wall Switch	188	2,728	Fixture Replacement	Yes	9	LED - Fixtures: High-Bay	Occupancy Sensor	56	1,910	0.88	4,193	0.0	$598.00	$26,146.80	$1,665.00	40.94
Cafetorium	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
Cafetorium Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	No	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Cafetorium Storage	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	660	Relamp	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	462	0.01	16	0.0	$2.28	$48.20	$10.00	16.73

	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
Cafetorium Chair Storage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.16	190	0.0	$27.08	$621.00	$60.00	20.72
Stage	12	Incandescent: Scew-In: PAR (60W) - 1L	Wall Switch	60	1,364	Relamp	No	12	LED Screw-In Lamps: Screw-In LED: (9W) - 1L	Wall Switch	9	1,364	0.40	960	0.0	$136.90	$645.04	$60.00	4.27
Stage	12	LED Screw-In Lamps: Scew-In: PAR (10W) - 1L	Wall Switch	10	1,364	None	No	12	LED Screw-In Lamps: Scew-In: PAR (10W) - 1L	Wall Switch	10	1,364	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stage	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,364	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,364	0.04	93	0.0	$13.20	$117.00	$10.00	8.11
Stage	3	Compact Fluorescent: Screw-In: (13W) - 1L	Wall Switch	13	1,364	None	No	3	Compact Fluorescent: Screw-In: (13W) - 1L	Wall Switch	13	1,364	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Stage	2	Exit Signs: LED - 2 W Lamp	None	6	1,364	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	1,364	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Main Office	9	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	9	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,910	0.23	1,098	0.0	$156.63	$838.80	$35.00	5.13
Principal's Office	10	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	10	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	1,910	0.25	1,220	0.0	$174.03	$902.00	$35.00	4.98
Principal's Office Restroom	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	2	LED - Linear Tubes: (2) U-Lamp	Occupancy Sensor	33	462	0.05	59	0.0	$8.42	$242.40	$0.00	28.79
Server Room / Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	No	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Room 100B	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.05	262	0.0	$37.31	$387.00	$55.00	8.90
Room 100B - back section	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.05	262	0.0	$37.31	$387.00	$55.00	8.90
CR 108	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.44	2,124	0.0	$302.88	$1,079.17	$135.00	3.12
CR 108	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$380.53	$80.00	2.29
CR 106	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.44	2,124	0.0	$302.88	$1,079.17	$135.00	3.12
CR 106	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$380.53	$80.00	2.29
CR 104	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.44	2,124	0.0	$302.88	$1,079.17	$135.00	3.12
CR 104	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$380.53	$80.00	2.29
CR 101	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.33	1,570	0.0	$223.87	$972.00	$155.00	3.65
CR 101 Restroom	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	660	None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	660	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
CR 101 Storage Closet	1	Incandescent: Screw-In: (60W) - 1L	Wall Switch	60	660	Relamp	No	1	LED Screw-In Lamps: Screw-In LED: (9W) - 1L	Wall Switch	9	660	0.03	39	0.0	$5.52	$53.75	$5.00	8.83
Janitor Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	No	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
CR 102	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.53	2,549	0.0	$363.45	$1,241.00	$155.00	2.99
CR 102	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.29	1,382	0.0	$197.03	$570.80	$120.00	2.29
CR 102 Storage Closet	1	Compact Fluorescent: Screw-In: (18W) - 1L	Wall Switch	18	660	None	No	1	Compact Fluorescent: Screw-In: (18W) - 1L	Wall Switch	18	660	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 102 Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	660	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	660	0.04	43	0.0	$6.06	$95.13	$20.00	12.40
CR 103	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.44	2,124	0.0	$302.88	$1,079.17	$135.00	3.12
CR 103	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$380.53	$80.00	2.29
CR 105	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.44	2,124	0.0	$302.88	$1,079.17	$135.00	3.12
CR 105	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$380.53	$80.00	2.29
CR 107	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.44	2,124	0.0	$302.88	$1,079.17	$135.00	3.12
CR 107	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$380.53	$80.00	2.29
CR 109	5	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.44	2,124	0.0	$302.88	$1,079.17	$135.00	3.12
CR 109	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$380.53	$80.00	2.29
Copy Room 2	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.16	785	0.0	$111.93	$621.00	$95.00	4.70
Womens Restroom 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	660	0.02	25	0.0	$3.57	$58.50	$10.00	13.58
Vice Principal's Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.10	461	0.0	$65.68	$460.27	$75.00	5.87
Boys Restroom 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.05	262	0.0	$37.31	$387.00	$20.00	9.84
Mens Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	660	0.02	25	0.0	$3.57	$58.50	$10.00	13.58
CR 150	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.33	1,570	0.0	$223.87	$972.00	$155.00	3.65
CR 150 Restroom	1	Incandescent: Screw-In: (60W) - 2L	Wall Switch	120	660	Relamp	No	1	LED Screw-In Lamps: Screw-In LED: (9W) - 2L	Wall Switch	18	660	0.07	77	0.0	$11.04	$107.51	$10.00	8.83
Janitor Closet 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	None	No	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Employee Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.05	262	0.0	$37.31	$233.00	$20.00	5.71
CR 111	8	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.71	3,398	0.0	$484.60	$1,564.67	$195.00	2.83
CR 111	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.19	921	0.0	$131.35	$380.53	$80.00	2.29
CR 113	10	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	10	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.89	4,248	0.0	$605.75	$1,888.33	$235.00	2.73
CR 113	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.10	461	0.0	$65.68	$190.27	$40.00	2.29
CR 115	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	1.07	5,097	0.0	$726.90	$2,212.00	$275.00	2.66
CR 114	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	1.07	5,097	0.0	$726.90	$2,212.00	$275.00	2.66
CR 112	6	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.53	2,549	0.0	$363.45	$1,241.00	$155.00	2.99

	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 112	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.29	1,382	0.0	$197.03	$570.80	$120.00	2.29
CR 110	12	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,728	Relamp & Reballast	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	1.07	5,097	0.0	$726.90	$2,212.00	$275.00	2.66
Custodial Closet (154)	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	660	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	660	0.04	45	0.0	$6.39	$117.00	$10.00	16.76
Boys Restroom (153)	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.08	392	0.0	$55.97	$445.50	$65.00	6.80
Girls Restroom (156)	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.08	392	0.0	$55.97	$445.50	$65.00	6.80
Gymnasium	44	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	176	2,728	Relamp	Yes	44	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	1,910	3.32	15,888	0.0	$2,265.71	$15,585.83	$2,860.00	5.62
Gymnasium	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gymnasium Storage	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	660	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	462	0.25	285	0.0	$40.62	$796.50	$90.00	17.39
Gymnasium Storage	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 Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,910	0.14	691	0.0	$98.51	$401.40	$80.00	3.26
CR 161	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.27	1,308	0.0	$186.56	$855.00	$135.00	3.86
CR 160 (Art)	24	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	24	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.66	3,140	0.0	$447.74	$1,944.00	$310.00	3.65
CR 160 (Art) Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	660	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	462	0.08	95	0.0	$13.54	$420.40	$30.00	28.83
CR 159	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,910	0.77	3,663	0.0	$522.36	$2,178.00	$350.00	3.50
Hallway: Kindergarten Wing	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: Kindergarten Wing	48	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	48	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,910	1.31	6,279	0.0	$895.48	$3,608.00	$480.00	3.49
Hallway: Kindergarten Wing	4	Compact Fluorescent: Pin Style: (18W) - 2L	Wall Switch	36	2,728	Relamp	No	4	LED Screw-In Lamps: Pin Style: (12W) - 2L	Wall Switch	25	2,728	0.03	136	0.0	$19.33	$352.41	$0.00	18.23
Hallway: Nurse's Office to CR 121	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
Hallway: Nurse's Office to CR 121	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,910	0.38	1,831	0.0	$261.18	$1,219.00	$140.00	4.13
Hallway: Nurse's Office to CR 121	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	1	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,910	0.05	230	0.0	$32.84	$295.13	$20.00	8.38
Hallway: Nurse's Office to CR 121	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,910	0.03	122	0.0	$17.40	$63.20	$0.00	3.63
Hallway: 1st & 2nd Grade Wing	5	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	5	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,910	0.24	1,151	0.0	$164.19	$675.67	$100.00	3.51
Hallway: 1st & 2nd Grade Wing	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway: CR 121 to Main Entry	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,728	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,910	0.02	82	0.0	$11.68	$200.00	$0.00	17.13
Hallway: CR 121 to Main Entry	1	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	1	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,910	0.03	122	0.0	$17.40	$63.20	$0.00	3.63

	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: CR 121 to Main Entry	10	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	10	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,910	0.48	2,303	0.0	$328.38	$1,151.33	$200.00	2.90
Hallway: CR 121 to Main Entry	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,910	0.08	392	0.0	$55.97	$375.50	$30.00	6.17
Hallway: CR 121 to Main Entry	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
Hallway: CR 121 to Main Entry	3	Compact Fluorescent: Screw-In: (18W) - 1L	Wall Switch	18	2,728	Relamp	No	3	LED Screw-In Lamps: Screw-In LED: (12W) - 1L	Wall Switch	13	2,728	0.01	51	0.0	$7.25	$161.26	$0.00	22.25
Hallway: CR 121 to Main Entry	3	LED Screw-In Lamps: Screw-In LED: (10W) - 1L	Wall Switch	10	2,728	None	No	3	LED Screw-In Lamps: Screw-In LED: (10W) - 1L	Wall Switch	10	2,728	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Lobby Area	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,728	None	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,728	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway: 4th Grade Wing	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,728	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,910	0.07	328	0.0	$46.71	$400.00	$0.00	8.56
Hallway: 4th Grade Wing	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: Copy Room to CR 151	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,910	0.22	1,047	0.0	$149.25	$868.00	$80.00	5.28
Hallway: 3rd Grade Wing	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,728	Relamp	Yes	11	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	1,910	0.53	2,533	0.0	$361.21	$1,446.47	$220.00	3.40
Hallway: 3rd Grade Wing	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: 139 to 151C	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,910	0.14	654	0.0	$93.28	$492.50	$50.00	4.74
Hallway: 139 to 151C	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
Backstage Ramp	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,728	0.06	311	0.0	$44.29	$175.50	$30.00	3.29
Backstage Ramp	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
Community Entrance	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,728	0.22	1,035	0.0	$147.64	$585.00	$100.00	3.29
Community Entrance	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Community Entrance	9	Compact Fluorescent: Pin Style: (18W) - 2L	Wall Switch	36	2,728	Relamp	No	9	LED Screw-In Lamps: Pin Style: (12W) - 2L	Wall Switch	25	2,728	0.06	305	0.0	$43.49	$792.92	$0.00	18.23
Community Entrance	4	Compact Fluorescent: Pin Style: (18W) - 1L	Wall Switch	18	2,728	Relamp	No	4	LED Screw-In Lamps: Pin Style: (12W) - 1L	Wall Switch	13	2,728	0.01	68	0.0	$9.66	$176.20	$0.00	18.23
Community Entrance Display Cabinet	2	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,728	Relamp & Reballast	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,728	0.04	198	0.0	$28.18	$196.00	$10.00	6.60
Hallway: Teamwork Terr.	5	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	5	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	1,910	0.13	610	0.0	$87.02	$516.00	$0.00	5.93
Hallway: Teamwork Terr.	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
Hallway: Teamwork Terr.	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,728	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,910	0.41	1,962	0.0	$279.84	$1,277.50	$150.00	4.03
Hallway: Teamwork Terr. Display Cabinet	1	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	2,728	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,728	0.02	99	0.0	$14.09	$98.00	$5.00	6.60
Community Entrance	6	High-Pressure Sodium: (1) 70W Lamp	Daylight Dimming	95	4,380	Fixture Replacement	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	29	4,380	0.26	2,010	0.0	$286.60	$2,344.06	$600.00	6.09

	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
Shed	2	Incandescent: Screw-In: (60W) - 1L	Daylight Dimming	60	4,380	Relamp	No	2	LED Screw-In Lamps: Screw-In LED: (9W) - 1L	Daylight Dimming	9	4,380	0.07	514	0.0	$73.27	$107.51	$10.00	1.33
Shed	1	High-Pressure Sodium: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	1	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	89	4,380	0.14	1,040	0.0	$148.33	$1,952.99	$100.00	12.49
Baseball Field	20	Mercury Vapor: (1) 1000W Lamp	Daylight Dimming	1,075	4,380	None	No	20	Mercury Vapor: (1) 1000W Lamp	Daylight Dimming	1,075	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Gym Entrance	5	High-Pressure Sodium: (1) 70W Lamp	Daylight Dimming	95	4,380	Fixture Replacement	No	5	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	29	4,380	0.22	1,675	0.0	$238.84	$1,953.39	$500.00	6.09
Nurse's Office Entrance	1	High-Pressure Sodium: (1) 70W Lamp	Daylight Dimming	95	4,380	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	29	4,380	0.04	335	0.0	$47.77	$390.68	$100.00	6.09
Building Lights	7	High-Pressure Sodium: (1) 100W Lamp	Daylight Dimming	138	4,380	Fixture Replacement	No	7	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	41	4,380	0.44	3,406	0.0	$485.72	$2,734.74	$700.00	4.19
Building Lights	11	High-Pressure Sodium: (1) 150W Lamp	Daylight Dimming	188	4,380	Fixture Replacement	No	11	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	56	4,380	0.95	7,292	0.0	$1,039.81	$4,297.45	$1,100.00	3.08
Building Lights	1	High-Pressure Sodium: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	1	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	89	4,380	0.14	1,040	0.0	$148.33	$390.68	$100.00	1.96
Building Lights	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	58	4,380	None	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	58	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Building Lights	7	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	41	4,380	None	No	7	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	41	4,380	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Motor Inventory & Recommendations

		Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Heating Distribution	1	Heating Hot Water Pump	5.0	87.5%	No	2,745	Yes	89.5%	Yes	1	0.68	5,153	0.0	$734.83	$4,196.91	$0.00	5.71
Boiler Room	Heating Distribution	1	Heating Hot Water Pump	5.0	87.5%	No	2,745	Yes	89.5%	Yes	1	0.68	5,153	0.0	$734.83	$4,196.91	$0.00	5.71
Boiler Room	Vacuum pumps	2	Process Pump	0.8	74.1%	No	2,745	No	74.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Vacuum pumps	2	Process Pump	1.0	82.5%	No	2,745	No	82.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Boiler Feed	2	Boiler Feed Water Pump	0.8	74.1%	No	2,745	No	74.1%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Heating Distribution	1	Heating Hot Water Pump	1.5	84.0%	No	2,745	Yes	86.5%	Yes	1	0.21	1,616	0.0	$230.46	$3,380.15	$0.00	14.67
Boiler Room	Heating Distribution	1	Heating Hot Water Pump	1.5	84.0%	No	2,745	Yes	86.5%	Yes	1	0.21	1,616	0.0	$230.46	$3,380.15	$0.00	14.67
Roof	Gym Hallways	1	Supply Fan	1.5	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Gym	2	Supply Fan	7.5	89.5%	No	2,745	Yes	91.7%	Yes	2	2.13	6,585	0.0	$939.08	$9,521.18	$1,200.00	8.86
Roof	Room 163	1	Supply Fan	1.5	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room 163	1	Return Fan	0.5	75.0%	No	2,745	No	75.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Teachers Lounge	1	Supply Fan	1.5	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Teachers Lounge	1	Return Fan	0.5	75.0%	No	2,745	No	75.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Nurse's Office	1	Supply Fan	1.5	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Nurse's Office	1	Return Fan	0.5	75.0%	No	2,745	No	75.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Hallways/Atrium	1	Supply Fan	1.5	84.0%	No	2,745	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Whole Building	1	Air Compressor	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	Whole Building	1	Air Compressor	2.0	84.0%	No	0	No	84.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classrooms/Offices	Classroom/Office Unit Ventilators	40	Supply Fan	0.3	70.0%	No	2,745	No	70.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Art Room	1	Split-System AC	3.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Music Room	1	Split-System AC	3.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Room 163	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Gym Office	1	Ductless Mini-Split AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Copier Room	1	Ductless Mini-Split AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Teachers Lounge	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Nurse's Office	1	Packaged AC	4.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom 171	1	Split-System AC	3.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom 173	1	Split-System AC	3.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom 175	1	Split-System AC	3.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom 172	1	Split-System AC	3.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom 174	1	Split-System AC	3.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom 176	1	Split-System AC	3.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Classroom	1	Ductless Mini-Split AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Tech Room	1	Ductless Mini-Split HP	1.25	18.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Library	1	Ductless Mini-Split HP	3.50	45.20	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Library	1	Ductless Mini-Split HP	3.50	45.20	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Building windows	Rooms	8	Window AC	1.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Fuel Heating Inventory & Recommendations

		Existing Conditions			Proposed Conditions						Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Whole Building except Gym	1	Natural Draft Steam Boiler	2,003.10	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	Whole Building except Gym	1	Natural Draft Steam Boiler	2,003.10	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Roof	Gym	1	Furnace	250.00	Yes	1	Furnace	250.00	95.00%	AFUE	0.00	0	18.1	$158.93	$5,664.33	$400.00	33.12
Roof	Gym	1	Furnace	250.00	Yes	1	Furnace	250.00	95.00%	AFUE	0.00	0	18.1	$158.93	$5,664.33	$400.00	33.12

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
Maintenance Room	Whole Building	2	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Memorial Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 85,098
Built: 1954

For Year Ending: September 30, 2017
Date Generated: May 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
Memorial Elementary School 53 West Grand Avenue Montvale, New Jersey 07645	Montvale School District 47 Spring Valley Road Montvale, NJ 07645 201-391-6226	Andrea Wasserman 47 Spring Valley Road Montvale, NJ 07645 201-391-6226 awasserman@montvalek8.org

Property ID: 6264123

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
77.5 kBtu/ft²

Source EUI
122.3 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	4,927,224 (75%)
Electric - Grid (kBtu)	1,666,298 (25%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	80
National Median Source EUI (kBtu/ft²)	126.3
% Diff from National Median Source EUI	-3%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	343

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)