Local Government Energy Audit:
Energy Audit Report

Canfield Elementary School

Mine Hill Township Board of Education
42 Canfield Avenue
Mine Hill, NJ 07803

March 7, 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 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 Canfield 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 as part of a comprehensive effort to assist New Jersey school districts in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

1.1 Facility Summary

Canfield Elementary School is a 61,940 square foot, single story facility comprised of classrooms, offices, and all purpose room/gym, kitchen and two mechanical rooms. One of the mechanical rooms serves the 200 wing and the other, older mechanical room serves the 100 wing. The building is open typically from 6AM to 3:30PM during weekdays and is used by the community minimally during the weekends.

The lighting at Canfield Elementary School underwent a comprehensive retrofit project in 2015 (via the NJCEP SmartStart, Prescriptive Lighting and Custom Electric incentive programs) which replaced most of the old, inefficient lighting with new LED fixtures. The building is heated using several non-condensing boilers (gas fired) serving different wings. The building is cooled using a number of rooftop units and split systems. 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 five (5) measures which together represent an opportunity for Canfield Elementary School to reduce annual energy costs by $3,457 and annual greenhouse gas emissions by 25,896 lbs CO_2e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 1.9 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce Canfield Elementary School's annual energy use by 3%.

Figure 1 – Previous 12 Month Utility Costs

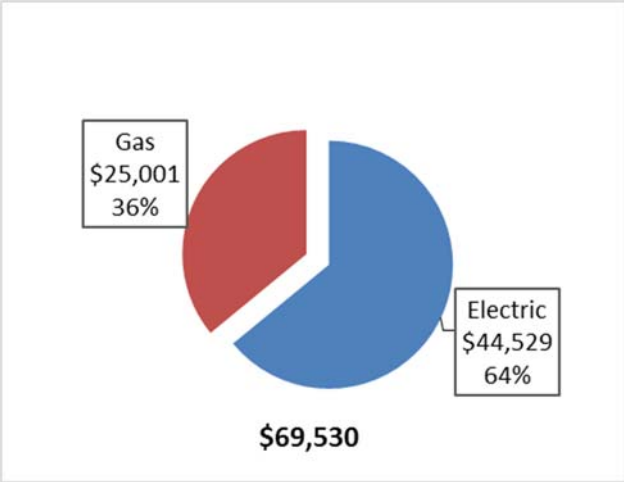
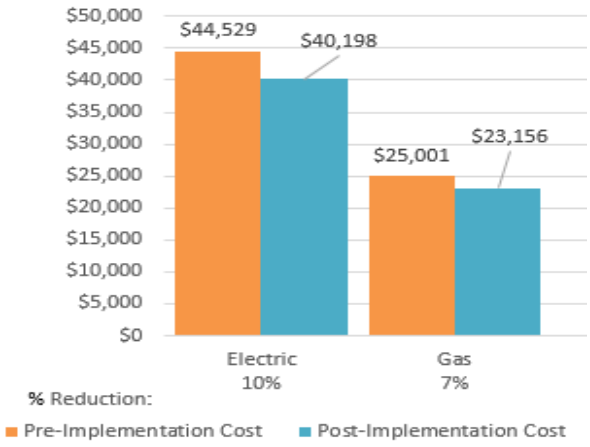


Figure 2 – Potential Post-Implementation Costs



A detailed description of Canfield Elementary School's existing energy use can be found in Section 3, "Site Energy Use and Costs".

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, "Energy Conservation Measures".

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			771	0.2	0.0	$105.15	$417.15	$0.00	$417.15	4.0	776
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	771	0.2	0.0	$105.15	$417.15	$0.00	$417.15	4.0	776
Lighting Control Measures			17,790	4.6	0.0	$2,427.66	$5,916.00	$1,020.00	$4,896.00	2.0	17,914
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	17,790	4.6	0.0	$2,427.66	$5,916.00	$1,020.00	$4,896.00	2.0	17,914
Electric Unitary HVAC Measures			7,039	4.2	0.0	$960.52	$43,629.58	$2,088.00	$41,541.58	43.2	7,088
	Install High Efficiency Electric AC	No	7,039	4.2	0.0	$960.52	$43,629.58	$2,088.00	$41,541.58	43.2	7,088
Gas Heating (HVAC/Process) Replacement			0	0.0	177.1	$1,758.45	$106,425.42	$12,475.60	$93,949.82	53.4	20,739
	Install High Efficiency Hot Water Boilers	No	0	0.0	177.1	$1,758.45	$106,425.42	$12,475.60	$93,949.82	53.4	20,739
HVAC System Improvements			4,187	0.9	0.0	$571.31	$1,250.00	$500.00	$750.00	1.3	4,216
ECM 3	Install Dual Enthalpy Outside Economizer Control	Yes	4,187	0.9	0.0	$571.31	$1,250.00	$500.00	$750.00	1.3	4,216
Domestic Water Heating Upgrade			0	0.0	8.7	$86.66	$86.04	$0.00	$86.04	1.0	1,022
ECM 4	Install Low-Flow Domestic Hot Water Devices	Yes	0	0.0	8.7	$86.66	$86.04	$0.00	$86.04	1.0	1,022
Plug Load Equipment Control - Vending Machine			1,954	0.0	0.0	$266.70	$460.00	$0.00	$460.00	1.7	1,968
ECM 5	Vending Machine Control	Yes	1,954	0.0	0.0	$266.70	$460.00	$0.00	$460.00	1.7	1,968
TOTALS OF ALL EVALUATED ECMS			31,740	10.0	185.8	$6,176.45	$158,184.19	$16,083.60	$142,100.59	23.0	53,723
TOTALS OF RECOMMENDED ECMS			24,701	6	9	3,457	8,129	1,520	6,609	1.9	25,896

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

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

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

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

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

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

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

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

Energy Efficient Practices

TRC also identified four (4) 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 Canfield Elementary School include:

- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- 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 Canfield Elementary School. Based on the configuration of the site and its loads there is a low potential for installing photovoltaic (PV) and combined heat and power self-generation measures.

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
- 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 7.

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 7.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce electric loads at commercial facilities, when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment Service Providers provide regular payments to medium and large consumers of electric power for their participation in DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 6 for additional information on this program.

Additional information on relevant incentive programs is located in Section 7. You may also check the following website for more details: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Carolina Rodriguez	Business Administrator	crodriguez@mineillcas.org	(973) 366-0590
TRC Energy Services			
Smruti Srinivasan	Auditor	ssrinivasan@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On December 21, 2016, TRC performed an energy audit at Canfield Elementary School located in Mine Hill, New Jersey. TRC's team met with Jesus to review the facility operations and help focus our investigation on specific energy-using systems.

Canfield Elementary School is a 61,940 square foot facility comprised of classrooms, offices, all purpose room/gym, kitchen and two mechanical rooms. The original building was built in 1953 with additions built in 1958, 1982, 1988 and 1999. This building is a single-story facility. One of the mechanical rooms (new) serves the 200 wing and the older mechanical room serves the 100 wing.

Canfield Elementary School underwent a comprehensive lighting retrofit project in 2015 which replaced mostly all of the old, inefficient lighting with new LED fixtures. The district participated in the SmartStart Prescriptive Lighting and Custom Electric incentive programs to help offset costs of the lighting retrofit project.

The building is heated using several non-condensing boilers (gas-fired) serving different wings. The building is cooled using a number of packaged air conditioners (on the rooftop) and split systems.

2.3 Building Occupancy

The school building is open Monday through Friday from 6AM to 3:30PM. On Saturdays the gym is leased out for sports activities and is closed on Sundays. This is a 10-month school where the typical occupancy on a weekday consists of 375 students and approximately 50 full time staff, including teachers, administration and maintenance. The typical schedule is presented in the table below.

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Canfield Elementary School	Weekday	6:00AM - 3:30PM
Canfield Elementary School	Weekend	Saturday: Room 119 leased out sometimes for sports activities. Sunday: No Operation

2.4 Building Envelope

The building is constructed of concrete block and has a brick facade. The building has a flat roof with (EPDM) membrane, which is a durable rubber-roofing material. Each section of the building has a varying state of condition as it pertains to the roof, however no leakages were observed.

The building has windows with double panes and doors that are framed with aluminum. The doors and windows were observed to be in good condition and show very little signs of outside are infiltration.

Image 1 Building exterior, windows, doors and roof

2.5 On-Site Generation

Canfield Elementary School installed a 73 kW solar energy project in June 2011. The project included photovoltaic (PV) arrays on the roof of the building. Sunlight General Capital, a national power-purchase agreement provider, was the financier of the solar energy system.

2.6 Energy-Using Systems

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

Lighting System

As mentioned previously, the facility had undergone a lighting upgrade through the SmartStart Prescriptive Lighting and Custom Electric incentive programs in 2015. Lighting is provided mostly by LED 15-Watt linear tubes each with electronic ballasts, as well as some T12 linear fluorescent tubes. Most of the fixtures are 2-lamp, 4-foot long troffers. The building also has screw-in LED lamps in smaller rooms such as storage spaces and bathrooms. All exit signs in the building are 2 Watt LED fixtures. Lighting control in all the spaces are provided by wall switches.

Exterior lighting is LED wall pack fixtures controlled via photocell.

Image 2 Typical lighting fixtures

Hot Water (or Steam) Heating System

The heating hot water system consists of two (2) non-condensing hot water boilers (HB Smith) with an output capacity of 1,699 Mbh serving the old wing and five (5) non-condensing boilers (Weil McLain) with an output of 346 MBh serving the newer additions. Boilers in both mechanical rooms are natural gas-fired. The boilers have a nominal combustion efficiency of 80%. The old wing boilers are 31 years and the new wing boilers are 19 years old. All boilers were evaluated for replacement.

The old wing boilers are configured with a constant flow distribution with (4) 2 hp and (2) 1.5 hp hot water pumps. The new wing boilers have (5) ¾ hp motors with constant flow. Hot water is supplied at a constant 180°F when the outside air temperature is below 50°F and modulated proportionally at 160°F until the outside air temperature is 65°F and shut down above 70°F.

Image 3 Hot water boilers

Direct Expansion Air Conditioning System (DX)

Space cooling is provided by packaged units, split AC systems and window AC units. Capacities vary between unit and include four (4) 1.5 tons, three (3) 2 tons, thirteen (13) 3.5 tons, one (1) 5 ton, one (1) 6 ton, one (1) 7.5 ton and one (1) 10 ton units on the rooftop serving various zones. The units are controlled by individual programmable thermostats in the respective zones. On an average the units are 11 years old but a few of the units are over 15 years old. They were evaluated for replacement but not recommended.

Image 4 Type of cooling equipment

Building Energy Management System (BEMS)

The building zones have pneumatic controls for the heat. There is an air compressor with two (2) 2-hp motors that communicate with the actuators to maintain heat in the classrooms and offices.

Image 5 Pneumatic controls

Domestic Hot Water Heating System

Domestic hot water is provided by two (2) domestic hot water heaters; one (1) Bradford White gas-fired hot water heater with an input rating of 38 kBtu/hr. each and an efficiency of 58%; and one (1) Rheem electric water heater with an input capacity of 9 kW. Both heaters have a tank capacity of 50 gallons.

Image 6 Domestic hot water heaters serving the kitchen and the restrooms

Food Service & Refrigeration

The school has an all-electric kitchen that is used to prepare approximately 400 lunches and snacks per day for the students and staff. Most of the cooking is done using the two convection ovens and the single large griddle. There is a conveyor dishwasher with an electric booster heater that provides 145°F rinse water. The kitchen also has seven (7) solid door commercial refrigerators and two (2) freezers.

Image 7 Refrigeration and cooking equipment sample

Building Plug Load

There are 166 computer work stations throughout the facility. Approximately 90% of the computers are desktop units with LCD monitors. There is no centralized PC power management software currently installed.

Other plug loads include printers, refrigerators, televisions, coffee machines, microwaves, laptops, etc. There are approximately 12 refrigerated beverage vending machines.

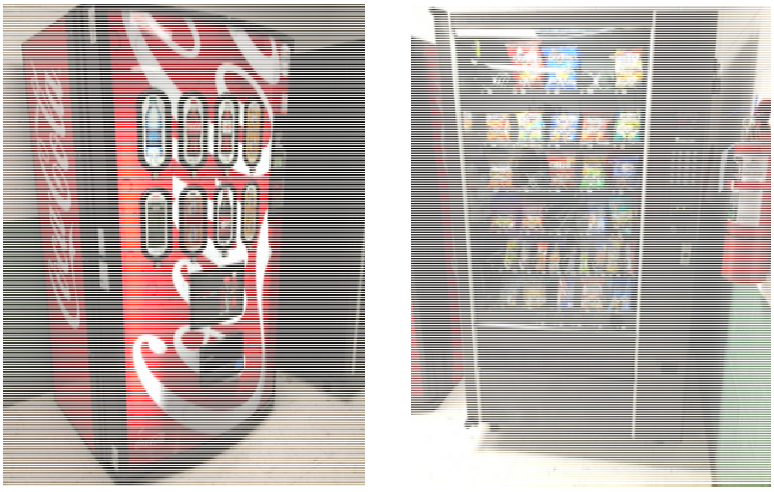


Image 8 Vending machines

2.7 Water-Using Systems

A sampling of restrooms found that 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. The elementary classrooms have sinks that are rated at 2.5 gpm.

Image 9 Sample of sinks in the classrooms and restrooms

3 SITE ENERGY USE AND COSTS

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

3.1 Total Cost of Energy

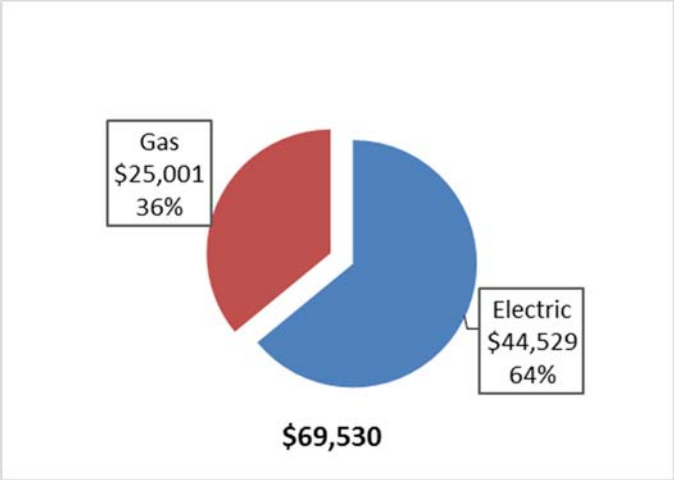
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 6 - Utility Summary

Utility Summary for Canfield Elementary School		
Fuel	Usage	Cost
Electricity	326,312	$44,529
Natural Gas	25,182	$25,001
Total		$69,530

The current annual energy cost for this facility is $69,530 as shown in the chart below.

Figure 7 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by JCP&L. The average electric cost over the past 12 months was $0.094/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 8 Electric Usage & Demand

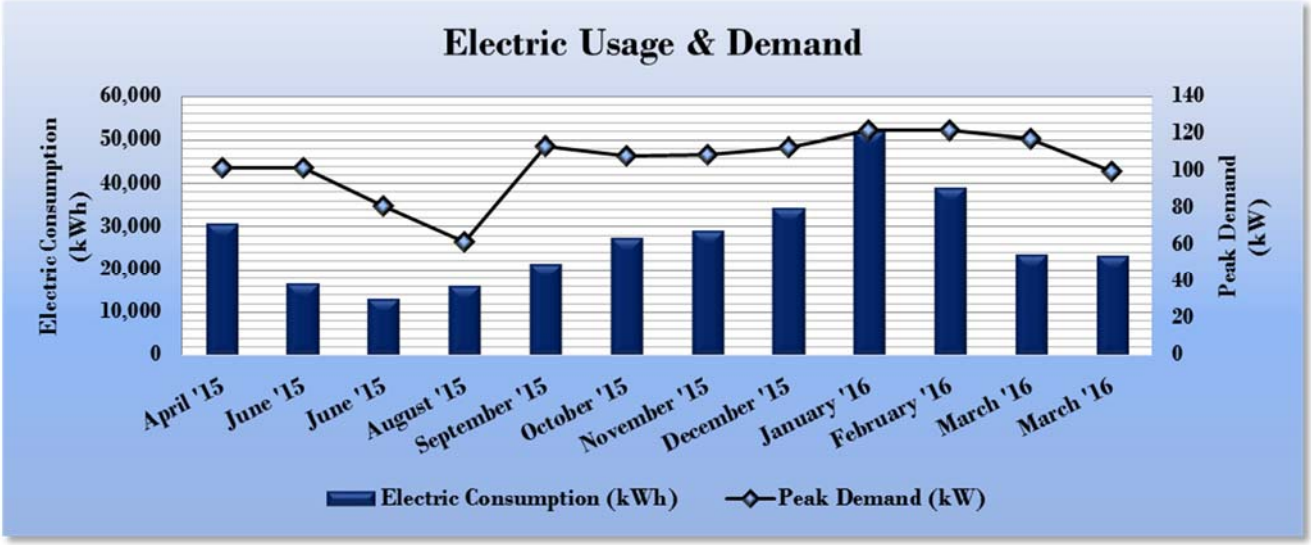


Figure 9 Electric Usage & Demand

Electric Billing Data for Canfield Elementary School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
5/15/15	30	30,880	102	$1,033	$3,655
6/17/15	33	16,641	102	$1,015	$2,988
7/15/15	28	13,041	81	$840	$2,695
8/17/15	33	16,080	62	$828	$2,770
9/16/15	30	21,360	113	$1,089	$3,403
10/19/15	33	27,441	108	$1,108	$3,850
11/16/15	28	29,200	109	$1,118	$3,984
12/16/15	30	34,401	113	$1,174	$4,391
1/18/16	33	52,000	122	$1,540	$6,217
2/17/16	30	39,041	122	$1,437	$4,401
3/17/16	29	23,680	117	$1,156	$3,233
4/15/16	29	23,441	100	$1,042	$3,064
Totals	366	327,206	122.1	$13,379	$44,651
Annual	365	326,312	122.1	$13,343	$44,529

3.3 Natural Gas Usage

Natural gas is provided by New Jersey Natural Gas. The average gas cost for the past 12 months is $0.993/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 10 Natural Gas Usage

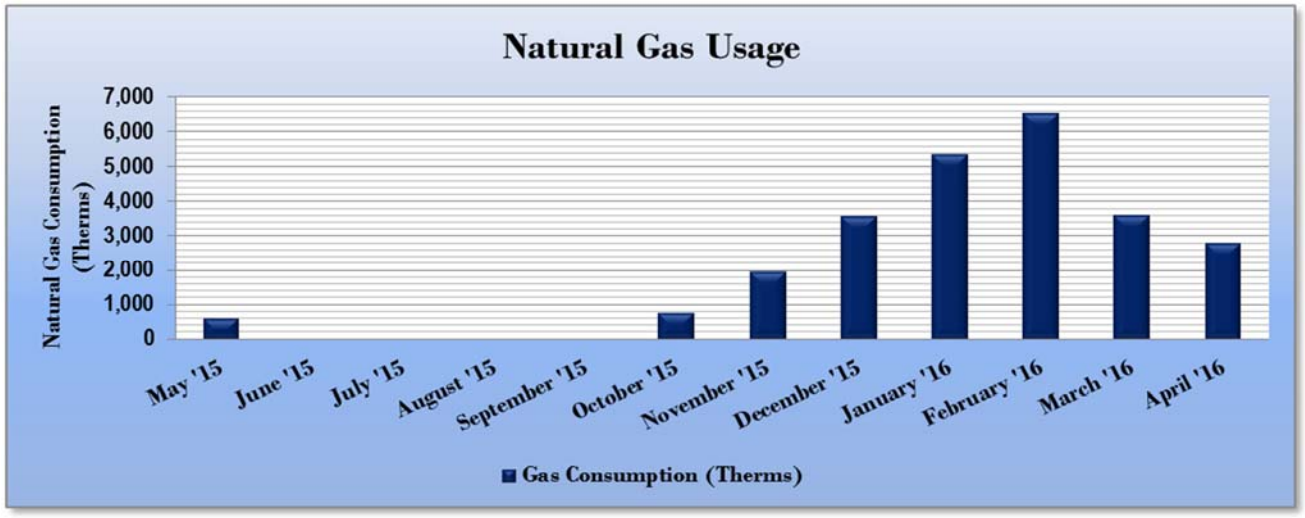


Figure 11 Natural Gas Usage

Gas Billing Data for Canfield Elementary School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
5/22/15	30	613	$917
6/24/15	33	31	$434
7/28/15	28	8	$415
8/24/15	33	8	$415
9/21/15	30	6	$414
10/20/15	33	783	$1,028
11/19/15	28	1,965	$1,964
12/21/15	30	3,563	$3,254
1/22/16	33	5,349	$4,680
2/24/16	30	6,510	$5,607
3/23/16	29	3,610	$3,292
4/27/16	29	2,806	$2,649
Totals	366	25,251	$25,069
Annual	365	25,182	$25,001

3.4 Benchmarking

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

The EUI is a measure of a facility's energy consumption per square foot, and it is the standard metric for comparing buildings' energy performance. Comparing the EUI of a building with the national median EUI for that building type illustrates whether that building uses more or less energy than similar buildings of its type on a square foot basis. EUI is presented in terms of "site energy" and "source energy". Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

Figure 12 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Canfield Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	99.1	141.4
Site Energy Use Intensity (kBtu/ft^2)	58.6	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 13 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Canfield Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft^2)	94.7	141.4
Site Energy Use Intensity (kBtu/ft^2)	57.1	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 82.

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

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

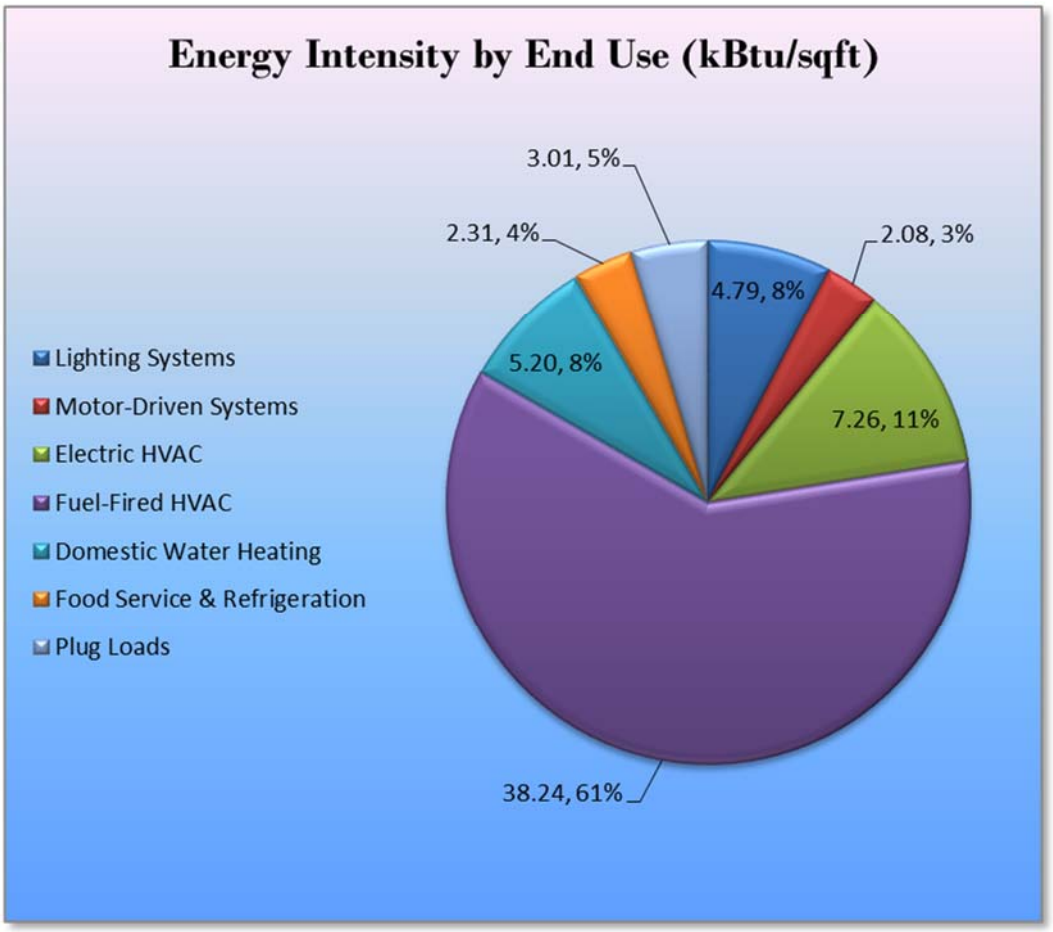
A Portfolio Manager account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio

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

3.5 Energy End-Use Breakdown

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

Figure 14 - Energy Balance (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 Canfield 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 7.

4.1 Recommended ECMs

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

Figure 15 – 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		771	0.2	0.0	$105.15	$417.15	$0.00	$417.15	4.0	776
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	771	0.2	0.0	$105.15	$417.15	$0.00	$417.15	4.0	776
Lighting Control Measures		17,790	4.6	0.0	$2,427.66	$5,916.00	$1,020.00	$4,896.00	2.0	17,914
ECM 2	Install Occupancy Sensor Lighting Controls	17,790	4.6	0.0	$2,427.66	$5,916.00	$1,020.00	$4,896.00	2.0	17,914
HVAC System Improvements		4,187	0.9	0.0	$571.31	$1,250.00	$500.00	$750.00	1.3	4,216
ECM 3	Install Dual Enthalpy Outside Economizer Control	4,187	0.9	0.0	$571.31	$1,250.00	$500.00	$750.00	1.3	4,216
Domestic Water Heating Upgrade		0	0.0	8.7	$86.66	$86.04	$0.00	$86.04	1.0	1,022
ECM 4	Install Low-Flow Domestic Hot Water Devices	0	0.0	8.7	$86.66	$86.04	$0.00	$86.04	1.0	1,022
Plug Load Equipment Control - Vending Machine		1,954	0.0	0.0	$266.70	$460.00	$0.00	$460.00	1.7	1,968
ECM 5	Vending Machine Control	1,954	0.0	0.0	$266.70	$460.00	$0.00	$460.00	1.7	1,968
TOTALS OF ALL EVALUATED ECMS		31,740	10.0	185.8	$6,176.45	$158,184.19	$16,083.60	$142,100.59	23.0	53,723
TOTALS OF RECOMMENDED ECMS		24,701	6	9	$ 3,457.48	$ 8,129.19	$ 1,520.00	$ 6,609.19	1.9	25,896

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

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

4.1.1 Lighting Upgrades

Recommended upgrades to existing lighting fixtures are summarized in Figure 16 below.

Figure 16 – Summary of Lighting Upgrade ECMs

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			771	0.2	0.0	$105.15	$417.15	$0.00	$417.15	4.0	776
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	771	0.2	0.0	$105.15	$417.15	$0.00	$417.15	4.0	776

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: 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	771	0.2	0.0	$72.13	$417.15	$0.00	$417.15	5.8	776
Exterior	0	0.0	0.0	$0.00	$0.00	$0.00	$0.00	0.0	0

Measure Description

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

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

4.1.2 Lighting Control Measures

Figure 17 – Summary of Lighting Control ECMs

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 Control Measures			17,790	4.6	0.0	$2,427.66	$5,916.00	$1,020.00	$4,896.00	2.0	17,914
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	17,790	4.6	0.0	$2,427.66	$5,916.00	$1,020.00	$4,896.00	2.0	17,914

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 2: 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)
17,790	4.6	0.0	$2,427.66	$5,916.00	$1,020.00	$4,896.00	2.0	17,914

Measure Description

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

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

4.1.3 HVAC System Upgrades

Our recommendation for HVAC system improvement are summarized in Figure 18 below.

Figure 18 - Summary of HVAC System Improvement ECMs

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)
HVAC System Improvements			4,187	0.9	0.0	$571.31	$1,250.00	$500.00	$750.00	1.3	4,216
ECM 3	Install Dual Enthalpy Outside Economizer Control	Yes	4,187	0.9	0.0	$571.31	$1,250.00	$500.00	$750.00	1.3	4,216

ECM 3: Install Dual-Enthalpy Economizers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
4,187	0.9	0.0	$571.31	$1,250.00	$500.00	$750.00	1.3	4,216

Measure Description

Dual enthalpy economizers are used to control a ventilation system's outside air intake in order to reduce a facility's total cooling load. A dual-enthalpy economizer monitors the air temperature and humidity of both the outside and return air. The control supplies the lowest energy (temperature and humidity) air to the air handling system. When outside air conditions allow, outside air can be used for cooling instead of running the air handling system's compressor. This reduces the demand on the cooling system, lowering its usage hours and saving energy. We recommend this be installed to the 10-ton packaged unit – Lennox. The area served by this system was not specified by the site contact during the audit.

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

4.1.4 Domestic Hot Water Heating System Upgrades

Our recommendations for domestic water heating system improvements are summarized in Figure 19 below.

Figure 19 - Summary of Domestic Water Heating ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		0	0.0	8.7	$86.66	$86.04	$0.00	$86.04	1.0	1,022
ECM 4	Install Low-Flow Domestic Hot Water Devices	0	0.0	8.7	$86.66	$86.04	$0.00	$86.04	1.0	1,022

ECM 4: Install Low-Flow DHW Devices Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	8.7	$86.66	$86.04	$0.00	$86.04	1.0	1,022

Measure Description

We recommend installing low-flow domestic hot water devices to reduce overall hot water demand. Energy demand from domestic hot water heating systems can be reduced by reducing water usage in general. Faucet aerators and low-flow showerheads can reduce hot water usage, relative to standard showerheads and aerators, which saves energy. Pre-rinse spray valves (PRSVs)—often used in commercial and institutional kitchens—are designed to remove food waste from dishes prior to dishwashing. Replacing standard pre-rinse spray valves with low flow PRSVs will reduce hot water usage and save energy.

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

4.1.5 Plug Load Equipment Control - Vending Machines

ECM 5: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
1,954	0.0	0.0	$266.70	$460.00	$0.00	$460.00	1.7	1,968

Measure Description

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

4.2 ECMs Evaluated But Not Recommended

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

Figure 20 – Summary of Measures Evaluated, But Not Recommended

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)
Electric Unitary HVAC Measures		7,039	4.2	0.0	$960.52	$43,629.58	$2,088.00	$41,541.58	43.2	7,088
Install High Efficiency Electric AC	No	7,039	4.2	0.0	$960.52	$43,629.58	$2,088.00	$41,541.58	43.2	7,088
Gas Heating (HVAC/Process) Replacement		0	0.0	177.1	$1,758.45	$106,425.42	$12,475.60	$93,949.82	53.4	20,739
Install High Efficiency Hot Water Boilers	No	0	0.0	177.1	$1,758.45	$106,425.42	$12,475.60	$93,949.82	53.4	20,739
TOTALS OF NON-RECOMMENDED ECMS		7,039	4	177	$ 2,718.97	$ 150,055.00	$ 14,563.60	$ 135,491.40	49.8	27,826

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

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

Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
7,039	4.2	0.0	$960.52	$43,629.58	$2,088.00	$41,541.58	43.2	7,088

Measure Description

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

Reasons for not Recommending

The payback period on replacing these units is 63 years, which is more than the useful life-time of these AC units. Eventually, when these units are at the end of their useful life and due for replacement, we recommend that they be replaced with high efficiency equipment.

Install High Efficiency Hot Water Boilers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated Install Cost ($)	Estimated Incentive ($)	Estimated Net Cost ($)	Simple Payback Period (yrs)	CO_2e Emissions Reduction (lbs)
0	0.0	177.1	$1,758.45	$106,425.42	$12,475.60	$93,949.82	53.4	20,739

Measure Description

We evaluated replacing the aged, inefficient hot water boilers in the old wing (31 years) and the new wing (18 years) with high efficiency hot water boilers. Significant improvements have been made in combustion technology resulting in increased overall boiler efficiency. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

Reasons for not Recommending

The payback period on replacing these units are 53.4 years, which is more than the useful life-time of a well maintained hot water boiler. Eventually, when these units are at the end of their useful life and due for replacement, we recommend that they be replaced with high efficiency modulating condensing boilers.

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.

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.

Practice Proper Use of Thermostat Schedules and Temperature Resets

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

Water Conservation

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

Installing dual flush or low-flow toilets and low-flow or waterless urinals are additional ways to reduce the sites water use, however, these devices do not provide energy savings at the site level. Any reduction in water use does however ultimately reduce grid level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users. The EPA WaterSense™ ratings for urinals is 0.5 gallons per flush (gpf) and toilets that use as little as 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

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

6 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.

7 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 21 for a list of the eligible programs identified for each recommended ECM.

Figure 21 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install
ECM 1	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x		x
ECM 2	Install Occupancy Sensor Lighting Controls	x		x
ECM 3	Install Dual Enthalpy Outside Economizer Control	x		x
ECM 4	Install Low-Flow Domestic Hot Water Devices			x
ECM 5	Vending Machine Control	x		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 (DI) 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.

7.1 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.

7.2 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.

7.3 Energy Savings Improvement Program

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

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

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

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

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

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

8 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

8.1 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.

8.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Entrance	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,912	None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Lobby	13	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	No	13	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Entrance	9	LED Screw-In Lamps: Recessed fixture - 1 lamp	Wall Switch	18	2,185	None	No	9	LED Screw-In Lamps: Recessed fixture - 1 lamp	Wall Switch	18	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Lobby	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Principal Office	5	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	5	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.06	219	0.0	$20.47	$116.00	$20.00	4.69
File Storage	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.05	175	0.0	$16.37	$116.00	$20.00	5.86
Hallway - Blue	19	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,912	None	No	19	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway - Blue	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,912	None	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway Blue	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Green Hallway	39	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,912	None	No	39	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Green Hallway	3	Exit Signs: Incandescent	None	45	8,760	None	No	3	Exit Signs: Incandescent	None	45	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classroom 100	15	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.17	656	0.0	$61.40	$116.00	$20.00	1.56
Classroom 101	15	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	15	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.17	656	0.0	$61.40	$116.00	$20.00	1.56
Classroom 103	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 102	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 104	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 105	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 106	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 107	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 108	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 109	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 110	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom111	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
PE Office 113	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.03	131	0.0	$12.28	$116.00	$20.00	7.82
Restroom	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.01	22	0.0	$2.05	$116.00	$20.00	46.91

	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
Green Hallway	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,912	None	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Girl's Restroom	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	780	None	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	546	0.03	39	0.0	$3.65	$116.00	$20.00	26.28
Girl's Restroom	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	780	None	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	780	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Green Hallway	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Nurse	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	No	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Nurse	1	LED Screw-In Lamps: Wall mount fixture	Wall Switch	14	2,185	None	No	1	LED Screw-In Lamps: Wall mount fixture	Wall Switch	14	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Bathroom	1	LED Screw-In Lamps: Wall mount fixture - 1 bulb	Wall Switch	14	780	None	No	1	LED Screw-In Lamps: Wall mount fixture - 1 bulb	Wall Switch	14	780	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	2	LED Screw-In Lamps: Wall mount fixture - 1 bulb	Wall Switch	14	2,912	None	No	2	LED Screw-In Lamps: Wall mount fixture - 1 bulb	Wall Switch	14	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boy's Restroom	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	924	0.02	40	0.0	$3.71	$116.00	$20.00	25.88
Boy's Restroom	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Closet	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,185	None	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Copy Room	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classroom 117	11	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.06	240	0.0	$22.51	$116.00	$20.00	4.26
Classroom 116	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 119	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.05	175	0.0	$16.37	$116.00	$20.00	5.86
Classroom 119	3	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	3	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.03	131	0.0	$12.28	$116.00	$20.00	7.82
Multi Purpose room	25	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	No	25	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Multi Purpose room	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,185	None	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Multi Purpose room	2	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,185	None	No	2	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Multi Purpose room	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	2,185	None	No	1	LED - Linear Tubes: (3) 2' Lamps	Wall Switch	26	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Multi Purpose room	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boys' Restroom- Blue Hallway	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	924	0.02	40	0.0	$3.71	$116.00	$20.00	25.88
Blue Hallway	4	Exit Signs: LED - 2 W Lamp	None	6	2,912	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Girls' Restroom Blue Hallway	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	None	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	924	0.02	40	0.0	$3.71	$116.00	$20.00	25.88
Kitchen	17	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,320	None	No	17	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,320	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
Education center	9	LED - Linear Tubes: (6) 4' Lamps	Wall Switch	87	2,185	None	Yes	9	LED - Linear Tubes: (6) 4' Lamps	Occupancy Sensor	87	1,530	0.15	590	0.0	$55.26	$116.00	$20.00	1.74
Blue Hallway Storage	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Blue Hallway Storage	3	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	80	2,185	Fixture Replacement	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	0.10	384	0.0	$35.99	$250.29	$0.00	6.95
BOE office	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.05	175	0.0	$16.37	$116.00	$20.00	5.86
Restroom	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,320	None	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,320	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Pantry	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Admin Office	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.05	175	0.0	$16.37	$116.00	$20.00	5.86
Superintendent Office	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.02	87	0.0	$8.19	$116.00	$20.00	11.73
Archives	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	No	2	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Speech Room	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Hallway Blue	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	No	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Orange hallway	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	No	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Office	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.09	350	0.0	$32.74	$116.00	$20.00	2.93
OT/PT room	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.09	350	0.0	$32.74	$116.00	$20.00	2.93
Classroom 129	14	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.08	306	0.0	$28.65	$116.00	$20.00	3.35
Bathroom	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	None	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
K4, K5	15	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	15	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.09	328	0.0	$30.70	$116.00	$20.00	3.13
Restroom	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	1,320	Fixture Replacement	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	0.04	90	0.0	$8.38	$83.43	$0.00	9.95
Classroom 124	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Classroom 127	12	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.07	262	0.0	$24.56	$116.00	$20.00	3.91
Restroom	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	None	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Lounge	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	None	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,320	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
EMC work room	4	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	2,185	None	No	4	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Art room	15	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	2,185	None	Yes	15	LED - Linear Tubes: (4) 2' Lamps	Occupancy Sensor	34	1,530	0.10	384	0.0	$35.99	$232.00	$40.00	5.33
Storage	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	156	None	No	1	LED - Linear Tubes: (4) 2' Lamps	Wall Switch	34	156	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Music Room	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Music Room	1	Linear Fluorescent - T12: 4' T12 (40W) - 4L	Wall Switch	176	2,185	Fixture Replacement	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	0.08	297	0.0	$27.76	$83.43	$0.00	3.01
Circle Hallway	8	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,912	None	No	8	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Circle Hallway	7	LED Screw-In Lamps: Spot fixtures - 1 bulb	Wall Switch	6	2,912	None	No	7	LED Screw-In Lamps: Spot fixtures - 1 bulb	Wall Switch	6	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Blue Hallway	30	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,912	None	No	30	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Technology Room	23	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,912	None	Yes	23	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,038	0.26	1,340	0.0	$125.46	$116.00	$20.00	0.77
Classroom 207	8	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	8	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.09	350	0.0	$32.74	$116.00	$20.00	2.93
Janitor Closet	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	104	None	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	104	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Blue Hallway	4	Exit Signs: LED - 2 W Lamp	None	6	2,912	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	2,912	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classroom 209	8	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,185	None	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,530	0.05	175	0.0	$16.37	$116.00	$20.00	5.86
Classroom 211	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Classroom 215	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Classroom 217	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Classroom 218	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Boiler Room	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	520	None	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	520	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	24	Exit Signs: LED - 2 W Lamp	None	6	520	None	No	24	Exit Signs: LED - 2 W Lamp	None	6	520	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Science Lab	24	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	No	24	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classroom 204	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Classroom 206	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Classroom 208	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Classroom 210	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Classroom 212	16	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,185	None	Yes	16	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,530	0.18	700	0.0	$65.49	$116.00	$20.00	1.47
Boys' Restroom	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,320	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	924	0.05	106	0.0	$9.89	$116.00	$20.00	9.71
Girls' Restroom	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	1,320	None	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	924	0.05	106	0.0	$9.89	$116.00	$20.00	9.71
Exterior lights	12	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	90	4,380	None	No	12	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	90	4,380	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
Exterior lights	8	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	20	4,380	None	No	8	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	20	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	Weil Mclain	5	Boiler Feed Water Pump	0.2	59.0%	No	2,745	No	59.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	HB smith boiler	2	Boiler Feed Water Pump	0.8	59.0%	No	2,745	No	59.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	HB smith boiler	2	Air Compressor	2.0	85.5%	No	4,957	No	85.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Exhaust fans	15	Exhaust Fan	0.2	59.0%	No	2,745	No	59.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Classrooms	Classrooms - Unit ventilators	30	Supply Fan	0.3	59.0%	No	2,745	No	59.0%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Boiler Room	HB smith boiler	2	Boiler Feed Water Pump	1.5	86.5%	No	2,745	No	86.5%	No		0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Electric HVAC Inventory & Recommendations

		Existing Conditions				Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rooftop	Canfield Elementary School	1	Split-System AC	5.00		Yes	1	Split-System AC	5.00		16.00		No	0.58	979	0.0	$91.63	$7,481.10	$460.00	76.63
Rooftop	Canfield Elementary School	2	Split-System AC	2.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Canfield Elementary School	1	Split-System AC	6.00		Yes	1	Split-System AC	6.00		16.00		No	0.70	1,175	0.0	$109.95	$6,982.62	$438.00	59.52
Rooftop	Canfield Elementary School	2	Split-System AC	3.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Canfield Elementary School	1	Packaged AC	3.75		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Canfield Elementary School	1	Packaged AC	10.00		Yes	1	Packaged AC	10.00		13.00		Yes	2.20	5,289	0.0	$495.13	$18,571.06	$980.00	35.53
Rooftop	Canfield Elementary School	10	Packaged Air-Source HP	3.50	42.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Canfield Elementary School	2	Packaged Air-Source HP	3.50	42.00	No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Canfield Elementary School	1	Packaged AC	7.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Canfield Elementary School	1	Packaged AC	6.00		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Canfield Elementary School	1	Packaged AC	5.00		Yes	1	Packaged AC	5.00		14.00		Yes	1.64	3,783	0.0	$354.15	$11,844.80	$710.00	31.44
Rooftop	Classroom 111	1	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Mr.Holman room	1	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	K4 and K5	2	Window AC	1.50		No							No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Rooftop	Lounge	1	Ductless Mini-Split AC	2.00		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	Old wing - Canfield Elementary School	2	Non-Condensing Hot Water Boiler	1,699.00	Yes	2	Condensing Hot Water Boiler	1,699.00	93.00%	Et	0.00	0	101.1	$1,003.31	$64,899.50	$7,475.60	57.23
Boiler Room - Blue Hallway	Blue hallway side of the school	5	Non-Condensing Hot Water Boiler	346.00	Yes	5	Condensing Hot Water Boiler	346.00	93.00%	Et	0.00	0	76.1	$755.14	$41,525.92	$5,000.00	48.37

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
Kitchen	Kitchen	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Mechanical room	Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Low-Flow Device Recommendations

	Recommedation Inputs				Energy Impact & Financial Analysis						
Location	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Classroom 104,111,129,124,Art room, lounge	7	Faucet Aerator (Kitchen)	2.50	2.20	0.00	0	2.3	$22.47	$50.19	$0.00	2.23
Restroom Green hallway, Blue hallway boys RR, CR 129, CR 124	5	Faucet Aerator (Lavatory)	2.20	1.00	0.00	0	6.5	$64.20	$35.85	$0.00	0.56

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions			Proposed Condi	Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	ENERGY STAR Qualified?	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	6	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	Yes	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Stand-Up Refrigerator, Solid Door (31 - 50 cu. ft.)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Freezer Chest	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Cooking Equipment Inventory & Recommendations

	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	High Efficiency Equipement?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	2	Electric Convection Oven (Half Size)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00
Kitchen	1	Insulated Food Holding Cabinet (1/2 Size)	No	No	0.00	0	0.0	$0.00	$0.00	$0.00	0.00

Dishwasher Inventory & Recommendations

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

Plug Load Inventory

	Existing Conditions			
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Canfield Elementary School	166	Computer	75.0	Yes
Canfield Elementary School	7	Laptop	40.0	Yes
Canfield Elementary School	3	Printer - Small	20.0	No
Canfield Elementary School	17	Printer - Medium	40.0	No
Canfield Elementary School	6	Printer - Large	200.0	No
Canfield Elementary School	2	Paper shredder	360.0	Yes
Canfield Elementary School	35	Projector	200.0	Yes
Canfield Elementary School	5	Microwave	900.0	No
Canfield Elementary School	2	Refrigerator - Medium	50.0	No
Canfield Elementary School	3	Refrigerator - Large, with freezer	200.0	No
Canfield Elementary School	1	Refrigerator - Double door	300.0	Yes
Canfield Elementary School	3	Coffee Machine	400.0	No
Canfield Elementary School	2	Toaster oven	1,200.0	No
Canfield Elementary School	1	Television - CRT/DLP	120.0	No
Canfield Elementary School	1	Television - LCD	120.0	No
Canfield Elementary School	2	Television - LED	100.0	Yes
Canfield Elementary School	4	Space Heater	1,500.0	Yes
Canfield Elementary School	29	Smart Board	5.0	Yes

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Lounge	1	Refrigerated	Yes	0.00	1,612	0.0	$150.89	$230.00	$0.00	1.52
Lounge	1	Non-Refrigerated	Yes	0.00	343	0.0	$32.06	$230.00	$0.00	7.17

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

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ENERGY STAR® Score[1]

Canfield Avenue Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 61,940
Built: 1959

For Year Ending: June 30, 2009
Date Generated: May 18, 2017

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
Canfield Avenue Elementary School 42 Canfield Avenue Mine Hill Township, New Jersey 07803	_____ , (___)___-_____	____ _____ , (___)___-_____ _____

Property ID: 5818816

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
76.2 kBtu/ft²

Source EUI
122 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	1,246,062 (26%)
Natural Gas (kBtu)	3,473,386 (74%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	107.5
National Median Source EUI (kBtu/ft²)	172.2
% Diff from National Median Source EUI	-29%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	327

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)