



Local Government Energy Audit: Energy Audit Report



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Veterans Memorial Elementary School

Brick Township Board of Education

103 Hendrickson Avenue
Brick, NJ 08724

April 16, 2018

Final Report by:
TRC Energy Services

Disclaimer

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

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

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

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

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I EXECUTIVE SUMMARY

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

The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey’s Clean Energy Program (NJCEP) for implementing ECMs.

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey school districts in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

I.1 Facility Summary

Veterans Memorial Elementary School is a one story, 54,357 square-foot building constructed in 1970. The building has a flat roof and exterior walls are finished with brick masonry. Interior lighting consists mainly of linear T8 fluorescent lamps and fixtures with electronic ballasts which are controlled by manual wall switches. Heating is provided by three non-condensing hot water boilers and rooftop packaged units. The cooling system consists of split system air conditioners, window units, heat pumps, and rooftop packaged units.

A thorough description of the facility and our observations are located in Section 2.

I.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 10 measures including nine high priority items which together represent an opportunity for Veterans Memorial Elementary School to reduce annual energy costs by \$20,967.61 and annual greenhouse gas emissions by 234,316 lbs CO₂e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 6.4 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce Veterans Memorial Elementary School’s annual energy use by 21%.

Figure 1 – Previous 12 Month Utility Costs

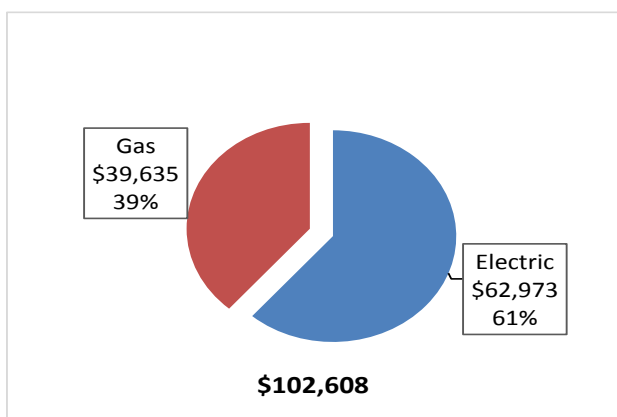
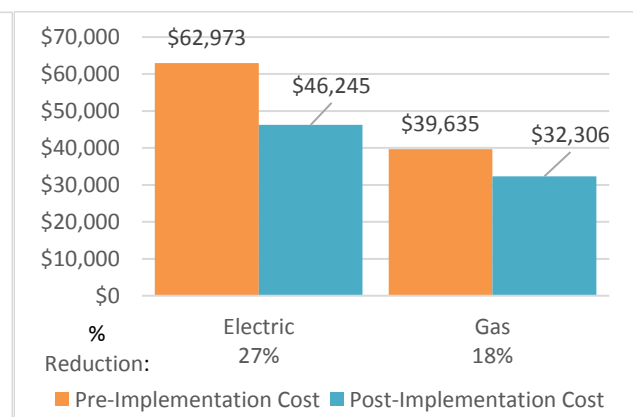


Figure 2 – Potential Post-Implementation Costs



A detailed description of Veterans Memorial Elementary School’s existing energy use can be found in Section 3.

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

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure		Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Natural Gas Savings (MMBtu)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades			119,574	21.6	0.0	0.0	\$13,730.62	\$67,234.86	\$8,805.00	\$58,429.86	4.3	120,410
ECM 1	Install LED Fixtures	Yes	46,038	6.0	0.0	0.0	\$5,286.54	\$23,046.02	\$1,900.00	\$21,146.02	4.0	46,360
ECM 2	Retrofit Fixtures with LED Lamps	Yes	71,924	15.5	0.0	0.0	\$8,258.99	\$42,037.74	\$6,905.00	\$35,132.74	4.3	72,427
ECM 3	Install LED Exit Signs	Yes	1,612	0.1	0.0	0.0	\$185.09	\$2,151.10	\$0.00	\$2,151.10	11.6	1,623
Lighting Control Measures			16,634	3.6	0.0	0.0	\$1,910.07	\$10,448.00	\$1,095.00	\$9,353.00	4.9	16,750
ECM 4	Install Occupancy Sensor Lighting Controls	Yes	12,987	2.8	0.0	0.0	\$1,491.25	\$8,848.00	\$1,095.00	\$7,753.00	5.2	13,077
ECM 5	Install High/Low Lighting Controls	Yes	3,647	0.8	0.0	0.0	\$418.82	\$1,600.00	\$0.00	\$1,600.00	3.8	3,673
Motor Upgrades			2,531	0.6	0.0	0.0	\$290.59	\$2,732.18	\$0.00	\$2,732.18	9.4	2,548
ECM 6	Premium Efficiency Motors	Yes	2,531	0.6	0.0	0.0	\$290.59	\$2,732.18	\$0.00	\$2,732.18	9.4	2,548
Variable Frequency Drive (VFD) Measures			4,976	0.6	0.0	0.0	\$571.44	\$3,275.85	\$0.00	\$3,275.85	5.7	5,011
ECM 7	Install VFDs on Hot Water Pumps	Yes	4,976	0.6	0.0	0.0	\$571.44	\$3,275.85	\$0.00	\$3,275.85	5.7	5,011
Electric Unitary HVAC Measures			5,961	4.0	0.0	0.0	\$684.47	\$21,915.95	\$0.00	\$21,915.95	32.0	6,002
	Install High Efficiency Electric AC	No	5,961	4.0	0.0	0.0	\$684.47	\$21,915.95	\$0.00	\$21,915.95	32.0	6,002
Gas Heating (HVAC/Process) Replacement			0	0.0	433.0	433.0	\$4,240.47	\$67,840.79	\$7,814.40	\$60,026.39	14.2	50,699
ECM 8	Install High Efficiency Hot Water Boilers	Yes	0	0.0	433.0	433.0	\$4,240.47	\$67,840.79	\$7,814.40	\$60,026.39	14.2	50,699
Plug Load Equipment Control - Vending Machine			1,954	0.0	0.0	0.0	\$224.42	\$460.00	\$0.00	\$460.00	2.0	1,968
ECM 9	Vending Machine Control	Yes	1,954	0.0	0.0	0.0	\$224.42	\$460.00	\$0.00	\$460.00	2.0	1,968
TOTALS FOR PROPOSED MEASURES			145,669	26.4	748.4	433.0	\$20,967.61	\$151,991.69	\$17,714.40	\$134,277.29	6.4	234,316
TOTALS FOR ALL MEASURES			151,630	30.4	433.0	433.0	\$21,652.09	\$173,907.63	\$17,714.40	\$156,193.23	7.2	203,390

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

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

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

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

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

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

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

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

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 Best Practices

TRC also identified 16 low cost (or no cost) energy efficient best 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 best practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. It is our understanding Brick Township Board of Education is already implementing many of the best practices described in the audit reports, however they are listed for representative purposes only.

- Perform Proper Lighting Maintenance
- Develop a Lighting Maintenance Schedule
- Ensure Lighting Controls Are Operating Properly
- Turn Off Unneeded Motors
- Reduce Motor Short Cycling
- Perform Routine Motor Maintenance
- Use Fans to Reduce Cooling Load
- Practice Proper Use of Thermostat Schedules and Temperature Resets
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Check for and Seal Duct Leakage
- Perform Proper Boiler Maintenance
- Perform Proper Furnace Maintenance
- Perform Proper Water Heater Maintenance
- Water Conservation

For details on these energy efficient best practices, please refer to Section 5.

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for Veterans Memorial Elementary School. Although Brick Township Board of Education implemented a solar energy project in 2017 and already evaluated each school building, TRC still performed an analysis to determine the potential for installing additional capacity at these sites as part of the LGEA program's scope of audit services. During the site visit, the roof at Veterans Memorial Elementary School was being outfitted with photovoltaic (PV) arrays. According to the power purchase agreement provided, Veterans Memorial Elementary School PV array will have a total capacity of 255 kW.

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

I.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 8.

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

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (ESIP). Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.3 for additional information on the ESIP Program.

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

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 4 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
James W. Edwards, Jr.	Business Administrator/Board Secretary	jedwards@brickschools.org	732 785-3000
Designated Representative			
Robert Gianettino	Head Custodian		732 785 3000 Ext.5509
TRC Energy Services			
Moussa Traore	Auditor	MTraore@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On February 15, 2017, TRC performed an energy audit at Veterans Memorial Elementary School located in Brick, New Jersey. TRC’s auditor met with Robert Gianettino to review the facility operations and help focus our investigation on specific energy-using systems.

Veterans Memorial Elementary School is a 54,357 square-foot facility comprised of classrooms, administrative offices, auditorium, kitchen, gymnasium, conference room, nurse’s room, mechanical and storage rooms. The facility is a typical elementary school built in 1970, with an addition to the building in 2002. The building roof was not accessible during the site visit. Information about the rooftop units was provided by the site contact.



2.3 Building Occupancy

The school operates on a 10-month schedule and is open Monday through Friday. The typical schedule is presented in the table below. During a typical day, the school is occupied by approximately 713 students and 93 staff.

Figure 5 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Veteran's Memorial Elementary School	Weekday	6:30 AM - 5:30 PM
Veteran's Memorial Elementary School	Weekend	Closed

2.4 Building Envelope

The one-story building has a concrete foundation and a flat roof. The roof was not accessible during the site visit as it was being outfitted with photovoltaic (PV) arrays. The site contact mentioned that the roof was in good condition. Exterior walls are finished with brick masonry. The windows throughout the facility are double pane, operable clear glass with aluminum frames. They are in good condition and appear to be well maintained. Exterior doors are constructed of metal and are in good condition as well. Overall, the building's envelope is in good condition with no signs of leaks from the roof and no signs of outside air infiltration.



2.5 On-Site Generation

Veterans Memorial Elementary School has a 480 kW Kohler diesel fuel backup generator located outside near the main entrance area. As mentioned in Section 1.2, construction of a solar PV array was in progress at this site at the time of the site visit.

2.6 Energy-Using Systems

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

Lighting System

Interior lighting is provided by 32-Watt linear fluorescent T8 lamps with electronic ballasts. Most of the linear fluorescent fixtures are 4-foot long with one, two or 4-lamps. The gymnasium is lit with 6-lamp 4 foot long fixtures. The kitchen and the gymnasium stage have some 60-Watt incandescent lamps. Exit signs throughout the building are a mixed of LED and incandescent fixtures. Interior lighting control is provided mainly by manual wall switches.

The building exterior lighting consists of a combination of metal halide lamps and LED outdoor wall mounted area fixtures. The parking lot has ten 400-Watt metal halide pole mounted fixtures. Exterior lights are controlled with photocells.

Hot Water Heating System

The hot water system consists of three non-condensing boilers. Two of the three boilers are HB Smith with an output capacity of 1,776 MBh and an estimated nominal combustion efficiency of 75%. They are located in the boiler room and serve the original section of the building. These boilers are more than 40 years old and appeared to be in poor condition and have exceeded their ASHRAE defined service life. They operate in a lead/lag configuration and are configured in a constant flow distribution with one 5 hp pump located in the boiler room, serving the original building heating hot water loop.

The third boiler is manufactured by Raypack with an output capacity of 512 MBh and a nominal combustion efficiency of 82%. It is located on the roof and serves the 2002 section of the building. This boiler is 15 years old and was not accessible during the site visit.

Typical classrooms contain a vertical unit ventilator with hot water coils for heating and direct expansion coils for cooling and dehumidification. Some unit ventilators are well beyond their expected service life

and appeared to be in poor condition. Thermostats are located in the classrooms for individual control of the perimeter unit ventilators.



Direct Expansion Air Conditioning System (DX)

The cooling system consists of nine ductless mini-split heat pumps, six split system air conditioners (AC), two window AC units, and two rooftop packaged units. The split system units are two years old and have a cooling capacity of two tons each and mostly serve the classrooms and offices. The kitchen is served by one 5-ton AAON packaged rooftop unit. This unit is also equipped with a natural gas fire heating section which has an output capacity of 96 MBh. The cafeteria is served by one 7.5-ton AAON packaged rooftop unit and has a 160 MBh natural gas heating section. Two 2-ton Friedrich window units are used to condition Room 27 and BSI room. The server room has a dedicated 2-ton Panasonic split AC.

The building contains three indoor air handling units (AHUs). The units appeared to be original to the building and are in fair condition. AHU-1 is located in the boiler room and serves the main office. AHU-2 is located in the mechanical closet and serves the library and the resource center. AHU-3 serves the auditorium and is also located in the mechanical closet. Air is exhausted from the toilet rooms through roof mounted exhaust fans.



Domestic Hot Water Heating System

Domestic hot water is provided by two hot water heaters located in electrical closets. One Bradford White non-condensing gas water heater with an input rating of 150 MBh and a nominal efficiency of 82% serves the old section of the building. It is two years old and has a 100-gallon storage tank.

The second water heater is a Richmond electric with an input rating of 4.5 kW. It has a 40 gallons storage tank and is also two years old. They are both in good condition.



Food Service & Refrigeration

There is a small institutional warming kitchen which includes gas cooking ovens, one stand up freezer, three stand up refrigerators, and two medium temperature walk-in freezers. The kitchen is well maintained and the walk-in units appear to be in good condition.

Building Plug Load

There are approximately 15 computer work stations throughout the facility and they are mostly desktop units with LCD monitors. There is no centralized PC power management software installed.

There is one server closet in the facility that has cooling provided by a 2-ton split AC unit. There are two vending machines in the Teacher room.

2.7 Water-Using Systems

There are several restrooms at this facility. A sampling of restrooms found that faucets are rated as low flow.

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

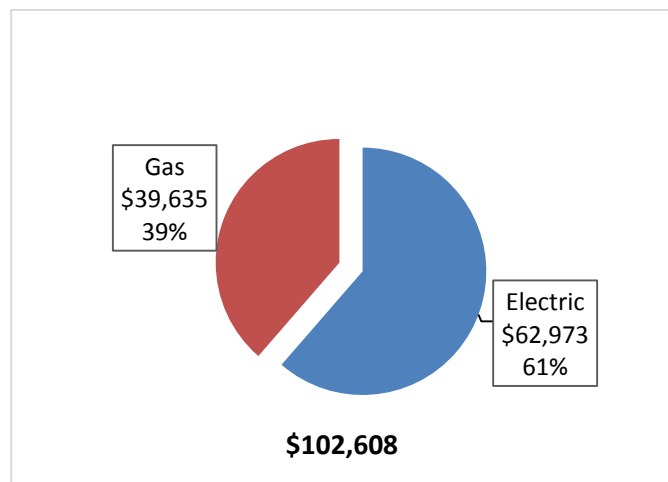
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 6 - Utility Summary

Utility Summary for Veteran's Memorial Elementary School		
Fuel	Usage	Cost
Electricity	548,400 kWh	\$62,973
Natural Gas	40,472 Therms	\$39,635
Total		\$102,608

The current annual energy cost for this facility is \$102,608 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 \$0.115/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. Summer use is higher than expected for 10-month scheduled operations. The facility should review equipment and lighting operations during unoccupied periods, for example during the summer. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 8 - Electric Usage & Demand

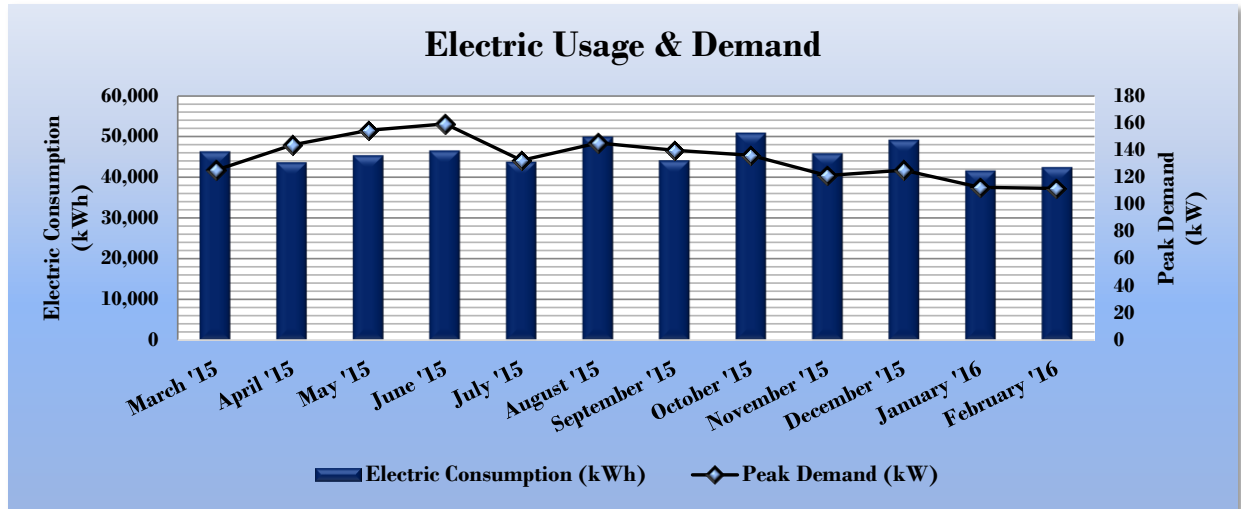


Figure 9 - Electric Usage & Demand

Electric Billing Data for Veteran's Memorial Elementary School					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
4/15/15	30	46,200	125		\$5,249
5/14/15	31	43,560	144		\$5,076
6/15/15	30	45,240	155		\$5,352
7/14/15	31	46,440	159		\$5,499
8/15/15	31	43,680	133		\$5,067
9/14/15	30	49,800	145		\$5,743
10/15/15	31	44,040	140		\$5,096
11/14/15	30	50,760	136		\$5,739
12/15/15	31	45,720	121		\$5,161
1/14/16	31	49,080	125		\$5,513
2/15/16	29	41,520	113		\$4,701
3/14/16	30	42,360	112		\$4,778
Totals	365	548,400	159.4	\$0	\$62,973
Annual	365	548,400	159.4	\$0	\$62,973

3.3 Natural Gas Usage

Natural gas is provided by NJ Natural Gas. The average gas cost for the past 12 months is \$0.979/therm, which is the blended rate used throughout the analyses in this report. Natural gas use follows a typical heating profile. The monthly gas consumption is shown in the chart below.

Figure 10 - Natural Gas Usage

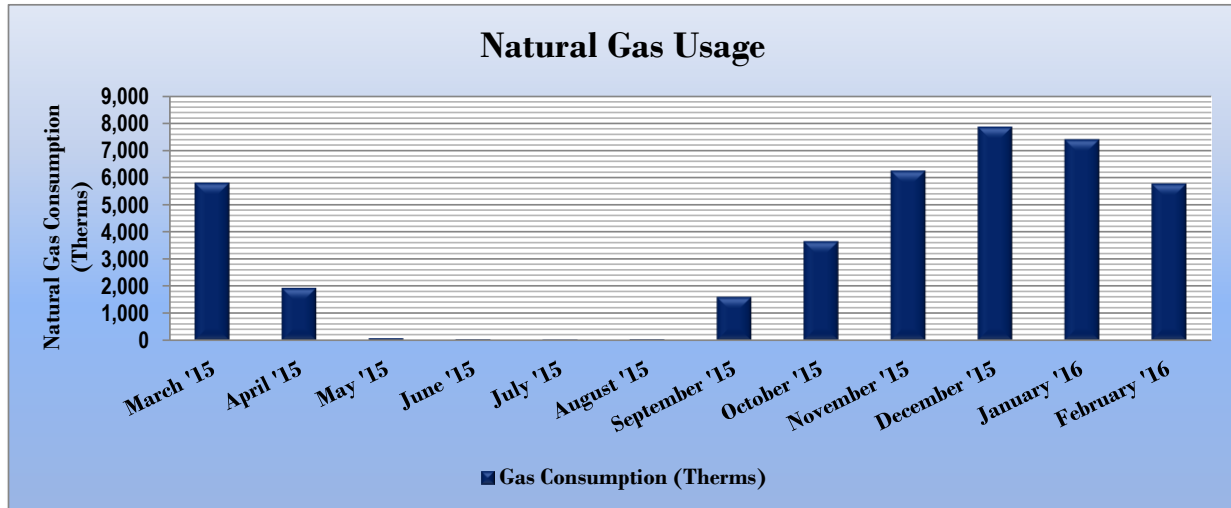


Figure 11 - Natural Gas Usage

Gas Billing Data for Veteran's Memorial Elementary School			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
4/15/15	30	5,802	\$5,385
5/14/15	31	1,929	\$2,178
6/15/15	30	83	\$648
7/14/15	31	37	\$611
8/15/15	31	29	\$604
9/14/15	30	41	\$614
10/15/15	31	1,600	\$1,847
11/14/15	30	3,648	\$3,344
12/15/15	31	6,256	\$5,692
1/14/16	31	7,867	\$6,863
2/15/16	29	7,402	\$6,655
3/14/16	30	5,777	\$5,194
Totals	365	40,472	\$39,635
Annual	365	40,472	\$39,635

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		
	Veteran's Memorial Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft ²)	186.3	141.4
Site Energy Use Intensity (kBtu/ft ²)	108.9	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		
	Veteran's Memorial Elementary School	National Median Building Type: School (K-12)
Source Energy Use Intensity (kBtu/ft ²)	149.2	141.4
Site Energy Use Intensity (kBtu/ft ²)	91.8	58.2

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building’s energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75 percent of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. This facility has a current score of 14.

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

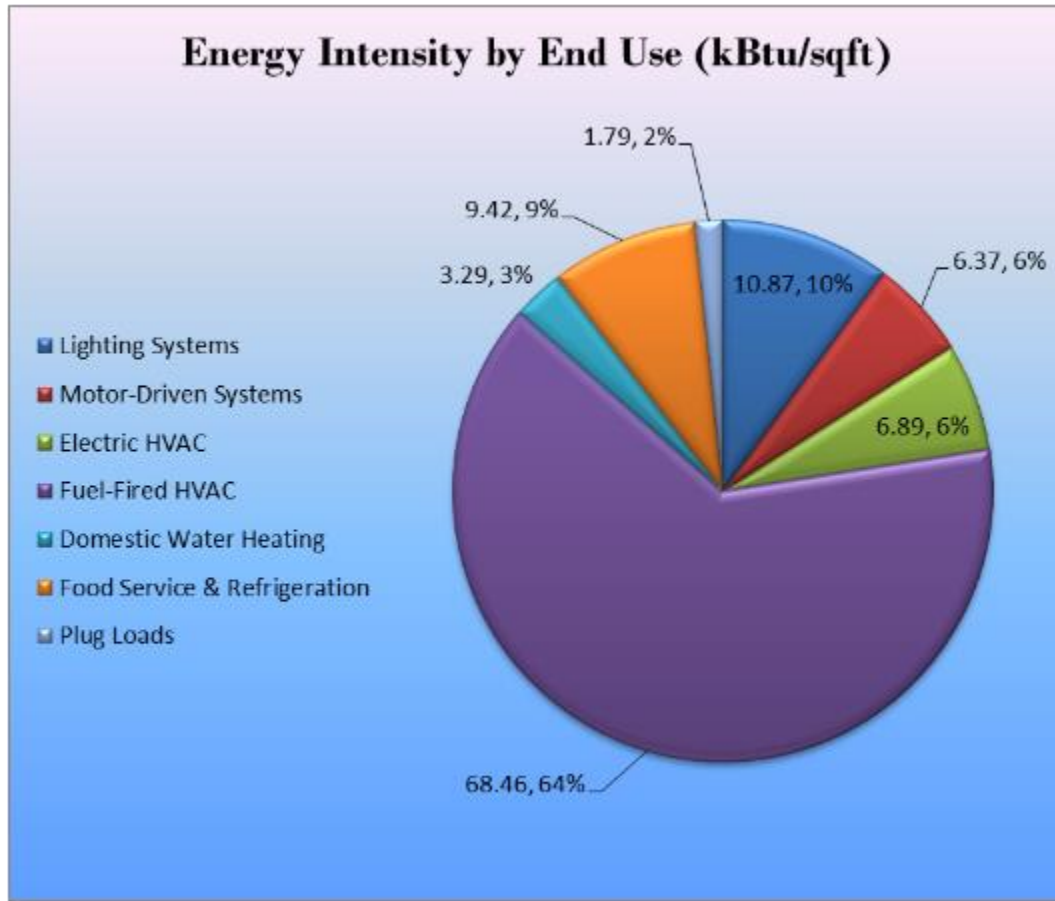
For more information on ENERGY STAR® certification go to: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1>.

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

The following sections describe the evaluated measures.

4.1 Recommended ECMs

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

Figure 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 ₂ e Emissions Reduction (lbs)
Lighting Upgrades		79,999	19.6	0.0	\$12,502.69	\$109,783.12	\$12,430.00	\$97,353.12	7.8	80,558
ECM 1	Install LED Fixtures	15,826	2.1	0.0	\$2,473.41	\$12,501.66	\$3,200.00	\$9,301.66	3.8	15,937
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	62,713	17.4	0.0	\$9,801.19	\$94,216.17	\$9,230.00	\$84,986.17	8.7	63,152
ECM 3	Retrofit Fixtures with LED Lamps	49	0.0	0.0	\$7.66	\$53.75	\$0.00	\$53.75	7.0	49
ECM 4	Install LED Exit Signs	1,410	0.1	0.0	\$220.42	\$3,011.54	\$0.00	\$3,011.54	13.7	1,420
Lighting Control Measures		11,260	2.9	0.0	\$1,759.81	\$9,798.00	\$1,285.00	\$8,513.00	4.8	11,339
ECM 5	Install Occupancy Sensor Lighting Controls	11,260	2.9	0.0	\$1,759.81	\$9,798.00	\$1,285.00	\$8,513.00	4.8	11,339
Variable Frequency Drive (VFD) Measures		10,065	1.3	0.0	\$1,573.06	\$6,551.70	\$0.00	\$6,551.70	4.2	10,136
ECM 6	Install VFDs on Hot Water Pumps	10,065	1.3	0.0	\$1,573.06	\$6,551.70	\$0.00	\$6,551.70	4.2	10,136
Gas Heating (HVAC/Process) Replacement		0	0.0	296.2	\$3,065.91	\$83,120.25	\$9,574.40	\$73,545.85	24.0	34,687
ECM 7	Install High Efficiency Hot Water Boilers	0	0.0	296.2	\$3,065.91	\$83,120.25	\$9,574.40	\$73,545.85	24.0	34,687
Domestic Water Heating Upgrade		0	0.0	136.3	\$1,410.49	\$35,213.23	\$1,225.00	\$33,988.23	24.1	15,958
ECM 8	Install High Efficiency Gas Water Heater	0	0.0	109.2	\$1,130.13	\$35,077.00	\$1,225.00	\$33,852.00	30.0	12,786
ECM 9	Install Low-Flow Domestic Hot Water Devices	0	0.0	27.1	\$280.36	\$136.23	\$0.00	\$136.23	0.5	3,172
TOTALS		101,325	23.7	432.5	\$20,311.96	\$244,466.31	\$24,514.40	\$219,951.91	10.8	152,678

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

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

4.1.1 Lighting Upgrades

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

Figure 16 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		119,598	21.6	0.0	\$13,733.41	\$67,225.46	\$8,825.00	\$58,400.46	4.3	120,434
ECM 1	Install LED Fixtures	46,038	6.0	0.0	\$5,286.54	\$23,046.02	\$1,900.00	\$21,146.02	4.0	46,360
ECM 2	Retrofit Fixtures with LED Lamps	71,948	15.5	0.0	\$8,261.78	\$42,028.34	\$6,925.00	\$35,103.34	4.2	72,451
ECM 3	Install LED Exit Signs	1,612	0.1	0.0	\$185.09	\$2,151.10	\$0.00	\$2,151.10	11.6	1,623

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

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	0	0.0	0.0	\$0.00	\$0.00	\$0.00	\$0.00	0.0	0
Exterior	46,038	6.0	0.0	\$5,286.54	\$23,046.02	\$1,900.00	\$21,146.02	4.0	46,360

Measure Description

We recommend replacing existing fixtures containing metal halide lamps with new high-performance LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

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

ECM 2: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	71,858	15.5	0.0	\$8,251.37	\$41,920.83	\$6,925.00	\$34,995.83	4.2	72,360
Exterior	91	0.0	0.0	\$10.41	\$107.51	\$0.00	\$107.51	10.3	91

Measure Description

We recommend retrofitting existing incandescent and linear T8 lamps with LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed while leaving the fluorescent fixture ballast in place. LED bulbs can be used in existing fixtures as a direct replacement for most other lighting technologies. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

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

ECM 3: Install LED Exit Signs

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	1,612	0.1	0.0	\$185.09	\$2,151.10	\$0.00	\$2,151.10	11.6	1,623
Exterior	0	0.0	0.0	\$0.00	\$0.00	\$0.00	\$0.00	0.0	0

Measure Description

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

4.1.2 Lighting Control Measures

Figure 17 – Summary of Lighting Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Lighting Control Measures		16,627	3.6	0.0	\$1,909.23	\$10,332.00	\$990.00	\$9,342.00	4.9	16,743
ECM 4	Install Occupancy Sensor Lighting Controls	12,987	2.8	0.0	\$1,491.25	\$8,732.00	\$990.00	\$7,742.00	5.2	13,077
ECM 5	Install High/Low Lighting Controls	3,640	0.8	0.0	\$417.98	\$1,600.00	\$0.00	\$1,600.00	3.8	3,665

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

ECM 4: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
12,987	2.8	0.0	\$1,491.25	\$8,732.00	\$990.00	\$7,742.00	5.2	13,077

Measure Description

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

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

ECM 5: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
3,640	0.8	0.0	\$417.98	\$1,600.00	\$0.00	\$1,600.00	3.8	3,665

Measure Description

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

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

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

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

4.1.3 Motor Upgrades

Our recommended motor upgrades are summarized in Figure 18 below.

Figure 18 – Summary of Motor Upgrade ECMs

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Motor Upgrades	2,531	0.6	0.0	\$290.59	\$2,732.18	\$0.00	\$2,732.18	9.4	2,548
ECM 6 Premium Efficiency Motors	2,531	0.6	0.0	\$290.59	\$2,732.18	\$0.00	\$2,732.18	9.4	2,548

ECM 6: Premium Efficiency Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
2,531	0.6	0.0	\$290.59	\$2,732.18	\$0.00	\$2,732.18	9.4	2,548

Measure Description

We recommend replacing the 5 hp standard efficiency motors with NEMA Premium® efficiency motors. Our evaluation assumes that existing motors will be replaced with motors of equivalent size and type. Although occasionally additional savings can be achieved by downsizing motors to better meet the motor's current load requirements. The base case motor efficiencies are estimated from nameplate information and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the New Jersey's Clean Energy Program Protocols to Measure Resource Savings (2016). Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours.

4.1.4 Variable Frequency Drive Measures

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

Figure 19 – Summary of Variable Frequency Drive ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		4,976	0.6	0.0	\$571.44	\$3,275.85	\$0.00	\$3,275.85	5.7	5,011
ECM 7	Install VFDs on Hot Water Pumps	4,976	0.6	0.0	\$571.44	\$3,275.85	\$0.00	\$3,275.85	5.7	5,011

ECM 7: Install VFDs on Hot Water Pumps

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
4,976	0.6	0.0	\$571.44	\$3,275.85	\$0.00	\$3,275.85	5.7	5,011

Measure Description

We recommend installing a variable frequency drives (VFD) to control the 5 hp hot water pumps. This measure requires that a majority of the hot water coils be served by 2-way valves and that a differential pressure sensor is installed in the hot water loop. As the hot water valves close, the differential pressure increases. The VFD modulates pump speed to maintain a differential pressure setpoint. Energy savings results from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

4.1.5 Gas-Fired Heating System Replacements

Our recommendations for gas-fired heating system replacements are summarized in Figure 20 below.

Figure 20 - Summary of Gas-Fired Heating Replacement 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 ₂ e Emissions Reduction (lbs)
Gas Heating (HVAC/Process) Replacement		0	0.0	433.0	\$4,240.47	\$67,840.79	\$7,814.40	\$60,026.39	14.2	50,699
ECM 8	Install High Efficiency Hot Water Boilers	0	0.0	433.0	\$4,240.47	\$67,840.79	\$7,814.40	\$60,026.39	14.2	50,699

ECM 8: 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 ₂ e Emissions Reduction (lbs)
0	0.0	433.0	\$4,240.47	\$67,840.79	\$7,814.40	\$60,026.39	14.2	50,699

Measure Description

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

The most notable efficiency improvement is condensing hydronic boilers that can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers were only evaluated when the return water temperature is less than 130°F during most of the operating hours. As a result, condensing hydronic boilers are recommended for this site.

4.1.6 Plug Load Equipment Control - Vending Machines

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

Figure 21 - Summary of Plug Load Equipment Control ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine		1,954	0.0	0.0	\$224.42	\$460.00	\$0.00	\$460.00	2.0	1,968
ECM 9	Vending Machine Control	1,954	0.0	0.0	\$224.42	\$460.00	\$0.00	\$460.00	2.0	1,968

ECM 9: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
1,954	0.0	0.0	\$224.42	\$460.00	\$0.00	\$460.00	2.0	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 22 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Electric Unitary HVAC Measures	5,961	4.0	0.0	\$684.47	\$21,915.95	\$0.00	\$21,915.95	32.0	6,002
Install High Efficiency Electric AC	5,961	4.0	0.0	\$684.47	\$21,915.95	\$0.00	\$21,915.95	32.0	6,002
TOTALS	5,961	4.0	0.0	\$684.47	\$21,915.95	\$0.00	\$21,915.95	32.0	6,002

* - 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 ₂ e Emissions Reduction (lbs)
5,961	4.0	0.0	\$684.47	\$21,915.95	\$0.00	\$21,915.95	32.0	6,002

Measure Description

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

Reasons for not Recommending

The overall simple payback for this project is 32 years which is more than the recommended ten-year threshold.

5 ENERGY EFFICIENT BEST 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. The recommendations below are for informational purposes only and do not reflect actual efforts actively being performed by Brick Township Board of Education.

Perform Proper Lighting Maintenance

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

Develop a Lighting Maintenance Schedule

In addition to routine fixture cleaning, development of a maintenance schedule can both ensure maintenance is performed regularly and can reduce the overall cost of fixture re-lamping and re-ballasting. By re-lamping and re-ballasting fixtures in groups, lighting levels are better maintained and the number of site visits by a lighting technician or contractor can be minimized, decreasing the overall cost of maintenance.

Ensure Lighting Controls Are Operating Properly

Lighting controls are very cost-effective energy efficient devices, when installed and operating correctly. As part of a lighting maintenance schedule, lighting controls should be tested annually to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight sensors, maintenance involves cleaning of sensor lenses and confirming setpoints and sensitivity are appropriately configured.

Turn Off Unneeded Motors

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Reducing run hours for these motors can result in significant energy savings. Whenever possible, use automatic devices such as twist timers or occupancy sensors to ensure that motors are turned off when not needed.

Reduce Motor Short Cycling

Frequent stopping and starting of motors subject rotors and other parts to substantial stress. This can result in component wear, reducing efficiency, and increasing maintenance costs. Adjust the load on the motor to limit the amount of unnecessary stopping and starting to improve motor performance.

Perform Routine Motor Maintenance

Motors consist of many moving parts whose collective degradation can contribute to a significant loss of motor efficiency. In order to prevent damage to motor components, routine maintenance should be performed. This maintenance consists of cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Use Fans to Reduce Cooling Load

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

Practice Proper Use of Thermostat Schedules and Temperature Resets

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

Clean Evaporator/Condenser Coils on AC Systems

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

Clean and/or Replace HVAC Filters

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

Check for and Seal Duct Leakage

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

Perform Proper Boiler Maintenance

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

Perform Proper Furnace Maintenance

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

Perform Proper Water Heater Maintenance

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

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 gallons per minute (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).

6 ON-SITE GENERATION MEASURES

On-site generation measure options include both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) on-site technologies that generate power to meet all or a portion of the electric energy needs of a facility, often repurposing any waste heat where applicable. Also referred to as distributed generation, these systems contribute to Greenhouse Gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, resulting in the electric system reliability through improved transmission and distribution system utilization.

The State of New Jersey's Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines a goal of 70% of the State's electrical needs to be met by renewable sources by 2050.

Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

6.1 Photovoltaic

Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility's electrical distribution system. The amount of unobstructed area available determines how large of a solar array can be installed. The size of the array combined with the orientation, tilt, and shading elements determines the energy produced.

The school district was in the process of installing a 255 kW PV array at Veterans Memorial Elementary School during the site visit. As mentioned in Section 1.2, a preliminary screening was performed based on the facility's electric demand, size and location of free area, and shading elements. The results show that the facility has a Low potential for installing an additional PV array.

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

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

6.2 Combined Heat and Power

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

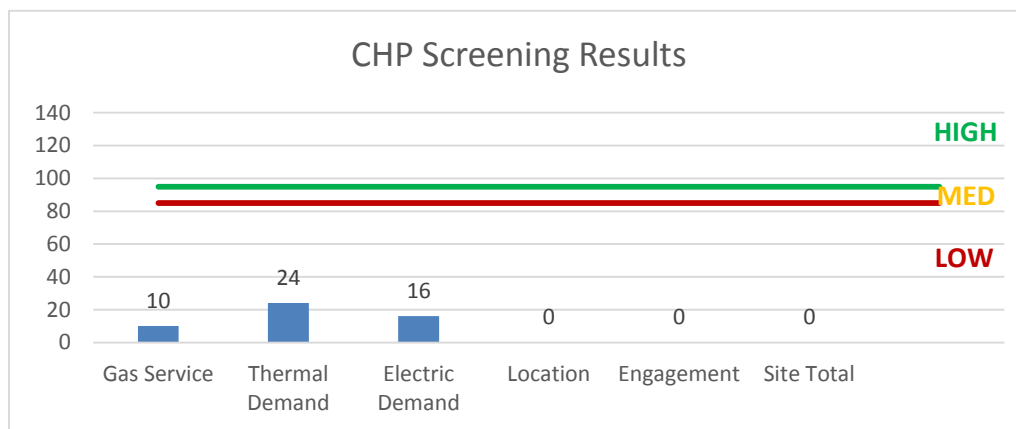
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste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

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

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

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

Figure 23 - Combined Heat and Power Screening



7 DEMAND RESPONSE

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

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

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

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

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

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.

In our opinion this building is not a good candidate for DR.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey’s Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and therefore a contributor to the fund your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 24 for a list of the eligible programs identified for each recommended ECM.

Figure 24- ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x		x			
ECM 2	Retrofit Fixtures with LED Lamps	x		x			
ECM 3	Install LED Exit Signs			x			
ECM 4	Install Occupancy Sensor Lighting Controls	x		x			
ECM 5	Install High/Low Lighting Controls						
ECM 6	Premium Efficiency Motors			x			
ECM 7	Install VFDs on Hot Water Pumps			x			
ECM 8	Install High Efficiency Hot Water Boilers	X		x			
ECM 9	Vending Machine Control			x			

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

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

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

8.1 SmartStart

Overview

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

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers

Electric Unitary HVAC

Gas Cooling

Gas Heating

Gas Water Heating

Ground Source Heat Pumps

Lighting

Lighting Controls

Refrigeration Doors

Refrigeration Controls

Refrigerator/Freezer Motors

Food Service Equipment

Variable Frequency Drives

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

Incentives

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

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

How to Participate

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

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

8.2 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 a recent 12-month period. You will work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives and controls.

Incentives

The program pays up to 70% of the total installed cost of eligible measures, up to \$125,000 per project. Direct Install participants will also be held to a fiscal year cap of \$250,000 per entity.

How to Participate

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

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

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

8.3 Energy Savings Improvement Program

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

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

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

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

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

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

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

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

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

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

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

9.2 Retail Natural Gas Supply Options

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

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

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

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

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.21	972	0.0	\$111.56	\$292.50	\$50.00	2.17
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	\$11.50	\$58.50	\$10.00	4.22
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.10	446	0.0	\$51.18	\$306.27	\$40.00	5.20
Kitchen	11	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	No	11	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	2,640	0.40	1,870	0.0	\$214.75	\$1,046.47	\$220.00	3.85
Kitchen	4	Incandescent: 60W A Lamp	Wall Switch	60	2,640	Relamp	No	4	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	9	2,640	0.13	619	0.0	\$71.12	\$254.60	\$20.00	3.30
Kitchen	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Gymnasium	12	Linear Fluorescent - T8: 4' T8 (32W) - 6L	Wall Switch	176	2,640	Relamp	Yes	12	LED - Linear Tubes: (5) 4' Lamps	Occupancy Sensor	73	1,848	0.99	4,563	0.0	\$523.98	\$1,647.40	\$120.00	2.91
Gymnasium	4	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	322	0.0	\$37.02	\$430.22	\$0.00	11.62
Gym Closet	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	4	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.05	213	0.0	\$24.40	\$143.60	\$20.00	5.06
Girls Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$387.00	\$20.00	12.62
Boys Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$387.00	\$20.00	12.62
Storage	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Storage	5	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	5	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.07	332	0.0	\$38.09	\$295.50	\$25.00	7.10
Gym Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$233.00	\$20.00	7.33
Back Corridor & New Section Corridor	33	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	33	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,848	0.90	4,178	0.0	\$479.74	\$2,130.50	\$330.00	3.75
Back Corridor & New Section Corridor	4	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	322	0.0	\$37.02	\$430.22	\$0.00	11.62
Back Corridor & New Section Corridor	1	LED - Fixtures: Downlight Solid State Retrofit	Wall Switch	9	2,640	None	Yes	1	LED - Fixtures: Downlight Solid State Retrofit	High/Low Control	9	1,848	0.00	8	0.0	\$0.94	\$0.00	\$0.00	0.00
Back Corridor & New Section Corridor	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,848	0.62	2,849	0.0	\$327.10	\$1,328.00	\$225.00	3.37
Back Corridor & New Section Corridor	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,848	0.05	253	0.0	\$29.08	\$117.00	\$20.00	3.34
Corridor	53	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	53	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,848	1.45	6,710	0.0	\$770.49	\$3,900.50	\$530.00	4.37
Corridor	8	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	8	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	645	0.0	\$74.03	\$860.44	\$0.00	11.62
Room 11	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 12	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 13	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 14	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 15	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 16	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 17	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 18	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Boys Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$387.00	\$20.00	12.62
Room 1	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 1 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 2	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 2 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 19	17	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	17	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.24	1,128	0.0	\$129.50	\$726.30	\$105.00	4.80
Room 19	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	\$11.50	\$58.50	\$10.00	4.22
Room 19 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 3	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 3 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 20	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.26	1,194	0.0	\$137.11	\$762.20	\$110.00	4.76
Room 20 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 4	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 4 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 21	18	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	18	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.26	1,194	0.0	\$137.11	\$762.20	\$110.00	4.76
Room 21 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 5	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 5 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 6	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 6 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Girls Restroom	3	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	3	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.03	146	0.0	\$16.73	\$144.60	\$30.00	6.85

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Room 101	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,848	0.49	2,279	0.0	\$261.68	\$1,018.40	\$200.00	3.13
Room 101 - Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	\$11.50	\$58.50	\$10.00	4.22
Room 102	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,848	0.49	2,279	0.0	\$261.68	\$1,018.40	\$200.00	3.13
Room 102 - Restroom	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	\$11.50	\$58.50	\$10.00	4.22
Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.04	200	0.0	\$23.01	\$117.00	\$20.00	4.22
Corridor - New Section	18	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	18	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	1,848	0.74	3,418	0.0	\$392.51	\$1,753.60	\$270.00	3.78
Boys Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,848	0.08	380	0.0	\$43.61	\$420.40	\$65.00	8.15
Girls Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,848	0.08	380	0.0	\$43.61	\$420.40	\$65.00	8.15
Custodian	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	\$11.50	\$58.50	\$10.00	4.22
Room 107	6	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	6	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.29	1,337	0.0	\$153.53	\$686.80	\$140.00	3.56
Corridor - New Section	2	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	2	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	2,640	0.04	176	0.0	\$20.22	\$126.40	\$0.00	6.25
Corridor - New Section	4	Exit Signs: Incandescent	None	14	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.02	322	0.0	\$37.02	\$430.22	\$0.00	11.62
Room 105	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.58	2,674	0.0	\$307.07	\$1,257.60	\$260.00	3.25
Room 103	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.58	2,674	0.0	\$307.07	\$1,257.60	\$260.00	3.25
Room 104	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.58	2,674	0.0	\$307.07	\$1,257.60	\$260.00	3.25
Room 106	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	114	2,640	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	1,848	0.58	2,674	0.0	\$307.07	\$1,257.60	\$260.00	3.25
Room 22	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 23	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 24	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 25	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 26	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 27	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 28	16	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	16	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.23	1,061	0.0	\$121.88	\$690.40	\$100.00	4.84
Room 29	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.01	53	0.0	\$6.10	\$35.90	\$5.00	5.06

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	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
Boys Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$387.00	\$20.00	12.62
BSI Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	6	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.09	398	0.0	\$45.70	\$331.40	\$50.00	6.16
Room 7	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 7 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 8	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 8 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 30	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 30 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Custodian Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$233.00	\$20.00	7.33
Room 10	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 10 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Room 31	17	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	17	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.24	1,128	0.0	\$129.50	\$726.30	\$105.00	4.80
Room 9	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Room 9 - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Vice Principal Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$233.00	\$20.00	7.33
Teacher Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,848	0.21	950	0.0	\$109.03	\$492.00	\$95.00	3.64
Conference Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.11	506	0.0	\$58.15	\$350.00	\$60.00	4.99
Conference Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	3	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.03	159	0.0	\$18.30	\$107.70	\$15.00	5.06
Nurse Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.11	531	0.0	\$60.94	\$403.20	\$60.00	5.63
Nurse Office - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Main Office	13	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	Yes	13	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,848	0.19	862	0.0	\$99.03	\$582.70	\$85.00	5.03
Main Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.04	200	0.0	\$23.01	\$117.00	\$20.00	4.22
Main Office - Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Principal Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.11	506	0.0	\$58.15	\$350.00	\$60.00	4.99
Principal Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.01	53	0.0	\$6.10	\$35.90	\$5.00	5.06

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	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
Auditorium	22	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	22	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,848	0.90	4,178	0.0	\$479.74	\$2,194.40	\$400.00	3.74
Auditorium - Closet	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.01	53	0.0	\$6.10	\$35.90	\$5.00	5.06
Auditorium	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
Auditorium - Stage	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.15	701	0.0	\$80.53	\$409.50	\$70.00	4.22
Auditorium - Stage	6	Incandescent: 60W A Lamp	Wall Switch	60	2,640	Relamp	No	6	LED Screw-In Lamps: Downlight Solid State Retrofit	Wall Switch	9	2,640	0.20	929	0.0	\$106.68	\$381.90	\$30.00	3.30
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.02	100	0.0	\$11.50	\$58.50	\$10.00	4.22
Girls Restroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$387.00	\$20.00	12.62
Mrs Hale Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.05	253	0.0	\$29.08	\$233.00	\$20.00	7.33
Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	1	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.01	53	0.0	\$6.10	\$35.90	\$5.00	5.06
Fan Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.02	106	0.0	\$12.20	\$71.80	\$10.00	5.06
Mechanical Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.02	106	0.0	\$12.20	\$71.80	\$10.00	5.06
Library	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Library	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,848	0.08	380	0.0	\$43.61	\$175.50	\$30.00	3.34
Library	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,848	0.12	570	0.0	\$65.42	\$341.60	\$65.00	4.23
Electrical Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	2,640	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	2,640	0.04	200	0.0	\$23.01	\$117.00	\$20.00	4.22
Exterior Perimeter Ligh	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	45	4,380	None	No	4	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	45	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Exterior Perimeter Ligh	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	55	4,380	None	No	6	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	55	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Exterior Perimeter Ligh	9	Metal Halide: (1) 250W Lamp	Daylight Dimming	295	4,380	Fixture Replacement	No	9	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Daylight Dimming	125	4,380	1.00	7,707	0.0	\$884.95	\$3,516.09	\$900.00	2.96
Front Entrance	2	Compact Fluorescent: 14W CFL Screen-in	Daylight Dimming	14	4,380	Relamp	No	2	LED Screw-In Lamps: Downlight Solid State Retrofit	Daylight Dimming	5	4,380	0.01	91	0.0	\$10.41	\$107.51	\$0.00	10.33
Parking Lot Pole Lighting	10	Metal Halide: (2) 400W Lamps	Daylight Dimming	916	4,380	Fixture Replacement	No	10	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Daylight Dimming	155	4,380	4.99	38,332	0.0	\$4,401.60	\$19,529.93	\$1,000.00	4.21
SSI Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	2,640	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,848	0.12	570	0.0	\$65.42	\$341.60	\$65.00	4.23
BSI Room	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	1,848	0.03	128	0.0	\$14.71	\$212.40	\$20.00	13.08
Room 29 Restroom	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	2,640	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	2,640	0.01	49	0.0	\$5.58	\$48.20	\$10.00	6.85
Teacher Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	2,640	Relamp	No	2	LED - Linear Tubes: (1) 4' Lamp	Wall Switch	15	2,640	0.02	106	0.0	\$12.20	\$71.80	\$10.00	5.06

Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Boiler	1	Heating Hot Water Pump	5.0	87.5%	No	2,745	Yes	89.5%	Yes	1	0.68	5,153	0.0	\$591.71	\$4,076.22	\$0.00	6.89
Boiler Room	Boiler	1	Other	0.3	70.0%	No	2,745	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Boiler Room	Boiler	2	Other	0.8	71.0%	No	2,745	No	71.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Boiler Room	AHU-1 (Indoor) - Boiler Room	1	Supply Fan	5.0	82.0%	No	2,745	Yes	89.5%	No		0.21	785	0.0	\$90.11	\$800.37	\$0.00	8.88
Mechanical Closet	AHU-2 (Indoor) - Library, Learning Center, Resource Center	1	Supply Fan	7.5	82.7%	No	3,391	Yes	91.0%	No		0.34	1,569	0.0	\$180.21	\$1,131.44	\$0.00	6.28
School	School Building	16	Supply Fan	0.3	71.7%	No	2,745	No	71.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
School	School Building	43	Other	0.3	71.5%	No	2,745	No	71.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Mechanical Closet	AHU-3 (Indoor) - Auditorium	1	Supply Fan	10.0	88.5%	No	3,391	No	88.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Ceiling	Heating and Ventilating Unit	2	Supply Fan	0.3	71.5%	No	2,745	No	71.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	AH Condensing Unit	1	Supply Fan	0.2	71.7%	No	2,745	No	71.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	AH Condensing Unit	1	Supply Fan	3.0	84.5%	No	2,745	No	84.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	AH Condensing Unit	1	Supply Fan	7.5	89.5%	No	3,391	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	AAON Packaged	1	Supply Fan	5.0	91.7%	No	2,745	No	91.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	AAON Packaged	1	Supply Fan	3.0	90.7%	No	2,745	No	90.7%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions		Proposed Conditions									Energy Impact & Financial Analysis							
		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
Gym Closet	Gym Closet	1	Split-System AC	1.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 12	Room 12	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 13	Room 13	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 14	Room 14	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 1	Room 1	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 20	Room 20	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 101	Room 101	1	Through-The-Wall AC	2.00		Yes	1	Ductless Mini-Split AC	2.00		18.00		No	1.00	1,490	0.0	\$171.12	\$5,478.99	\$0.00	32.02
Server Room	Server Room	1	Split-System AC	2.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 105	Room 105	1	Ductless Mini-Split AC	2.00		Yes	1	Ductless Mini-Split AC	2.00		18.00		No	1.00	1,490	0.0	\$171.12	\$5,478.99	\$0.00	32.02
Room 107	Room 107	1	Ductless Mini-Split AC	2.00		Yes	1	Ductless Mini-Split AC	2.00		18.00		No	1.00	1,490	0.0	\$171.12	\$5,478.99	\$0.00	32.02
Room 103	Room 103	1	Ductless Mini-Split AC	2.00		Yes	1	Ductless Mini-Split AC	2.00		18.00		No	1.00	1,490	0.0	\$171.12	\$5,478.99	\$0.00	32.02
Room 23	Room 23	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 27	Room 27	1	Window AC	2.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
BSI Room	BSI Room	1	Window AC	2.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 30	Room 30	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Room 9	Room 9	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Teacher Room	Teacher Room	1	Ductless Mini-Split HP	2.00	24.00	No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Mrs Hale Office	Mrs Hale Office	1	Split-System AC	2.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	AHU-1	1	Split-System AC	5.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	AHU-2	1	Split-System AC	10.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

		Existing Conditions				Proposed Conditions							Energy Impact & Financial Analysis							
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Rooftop	AHU-3	1	Split-System AC	20.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	Cafeteria	1	Packaged AC	7.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Rooftop	Kitchen	1	Packaged AC	5.00		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	Original Building	2	Non-Condensing Hot Water Boiler	1,776.00	Yes	2	Condensing Hot Water Boiler	1,776.00	91.00%	Et	0.00	0	433.0	\$4,240.47	\$67,840.79	\$7,814.40	14.16	
Rooftop	2002 Addition Perimeter Heating	1	Non-Condensing Hot Water Boiler	512.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Rooftop	Cafeteria	1	Furnace	160.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Rooftop	Kitchen	1	Furnace	96.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	

DHW Inventory & Recommendations

		Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Electrical Closet	Old section, Kitchen & Gymnasium Restrooms	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Electrical Closet	New Section	1	Storage Tank Water Heater (≤ 50 Gal)	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Walk-In Cooler/Freezer Inventory & Recommendations

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

Commercial Refrigerator/Freezer Inventory & Recommendations

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

Cooking Equipment Inventory & Recommendations

Location	Existing Conditions			Proposed Conditions	Energy Impact & Financial Analysis							
	Quantity	Equipment Type		High Efficiency Equipment?	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Gas Combination Oven/Steam Cooker (<15 Pans)		Yes	No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Kitchen	1	Gas Convection Oven (Full Size)		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?
Kitchen	1	Food Warmer	1,500.0	No
School	5	Refrigerator	256.0	Yes
School	2	Water Fountain	225.0	No
School	4	Microwave	1,000.0	No
School	3	Coffee machine	900.0	No
School	3	Copy Machine	800.0	Yes
School	15	Desktop Computer with LCD Monitor	191.0	Yes
School	8	Small Printer	46.0	Yes
School	95	Laptop	45.0	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
Teacher Room	1	Refrigerated	Yes	0.00	1,612	0.0	\$185.09	\$230.00	\$0.00	1.24
Teacher Room	1	Non-Refrigerated	Yes	0.00	343	0.0	\$39.33	\$230.00	\$0.00	5.85

Appendix B: ENERGY STAR® Statement of Energy Performance

ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

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ENERGY STAR®
Score¹

Veteran's Memorial Elementary School

Primary Property Type: K-12 School
Gross Floor Area (ft²): 54,357
Built: 1970

For Year Ending: February 29, 2016
Date Generated: August 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 Veteran's Memorial Elementary School 103 Hendrickson Avenue Brick, New Jersey 08723	Property Owner Brick Township Board of Education 101 Hendrickson Avenue Brick, NJ 08724 (732) 785-3000	Primary Contact James Edwards 101 Hendrickson Avenue Brick, NJ 08724 (732) 785-3000 jedwards@brickschools.org
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Property ID: 6013404

Energy Consumption and Energy Use Intensity (EUI)

Site EUI	Annual Energy by Fuel		National Median Comparison	
113 kBtu/ft ²	Electric - Grid (kBtu)	1,857,172 (30%)	National Median Site EUI (kBtu/ft ²)	78.5
	Natural Gas (kBtu)	4,285,478 (70%)	National Median Source EUI (kBtu/ft ²)	132
			% Diff from National Median Source EUI	44%
Source EUI			Annual Emissions	
190.1 kBtu/ft ²			Greenhouse Gas Emissions (Metric Tons CO ₂ e/year)	434

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)